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# C O N T E N T S

# O B S A H

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# APPLICATION OF THE ANALYTIC NETWORK PROCESS IN THE AREA OF EMPLOYEE SELECTION

# APLIKÁCIA ANALYTICKÉHO SIEŤOVÉHO PROCESU V OBLASTI VÝBERU ZAMESTNANTCOV

***Abstract**: Employee selection is one of the fundamental activities of human resource management. Incorrect evaluation of the quality of each candidate applying for a job would have negative effects on the whole development and direction of the company. Therefore, the aim of this paper is to analyse the possibility of using multi-criteria decision making method called Analytic Network Process in the model employee selection, in order to support human resource management in the effective decision making. In the conclusion, recommendations for the use of the ANP in practice are suggested from the obtained results.*
***Keywords:** multi-criteria decision making, analytic network process, human resource management, employee selection*

***Kľúčové slová:** viackriteriálne rozhodovanie, analytický sieťový proces, manažment ľudských zdrojov, výber zamestnancov*

**JEL:** C44, O15

## Introduction

Decision making is the process of identifying and selecting alternatives based on the values and preferences of the decision maker. Make a decision does not just mean to choose suitable alternatives, but often the intention of the decision maker is to choose from among all alternatives the one that best meets determined goals, criteria, needs etc. [4].

In the professional life there are often situations that require the execution of efficient and well-considered decisions, e.g.: employee selection, purchase of the material and technical equipment, evaluation of the quality of hospitals and the like. Human resource managers responsible for decision making can use various multi-criteria decision making methods (MCDM) that are able to provide suitable evaluation frameworks in order to support the execution of effective decisions in the area of selection. The most common MCDM method is undoubtedly Analytic Network Process (ANP) [11]. Therefore, the aim of this study is to analyse the possibility of using ANP method on model scenario of employee selection and so to clarify the benefits of using this method in selection process for potential users among managers.

The structure of this article is as follows. The second part is focused on the theoretical definition and explanation of the process of the ANP application. The third chapter focuses on the application of the ANP method in the employee

selection process, the synthesis of the final weights and the graphical comparison of the obtained results. The conclusion of this article is focused on the evaluation of the results and proposals for the further use of the MCDM methods.

**Analytic Network Process**

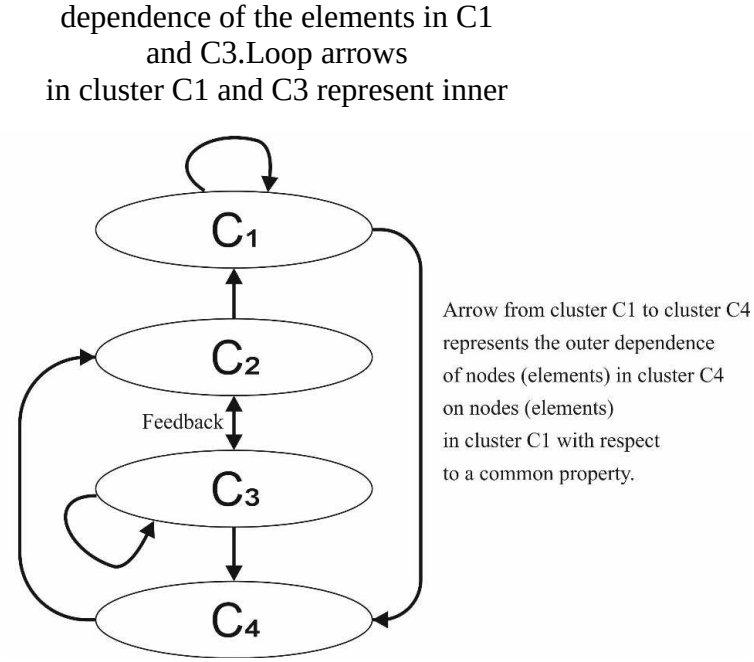
The Analytic Network Process (ANP) is a multi-criteria decision making tool that can solve all kinds of relationships, dependencies and responses of decision making problem. Therefore, this method is a more general version of its predecessor Analytic Hierarchy Process (AHP) [7].

By the reason that many decision making problems cannot be structured hierarchically (as it is in AHP), the ANP method was introduced by Saaty [10]. Therefore, it is necessary to use ANP method in such situations and divide the problem into so-called network, which is formed by interconnection of elements and clusters. Elements can represent criteria, sub-criteria or alternatives of the decision making problem. In the graph theory, the elements are nodes and interconnections are edges.

The process of the ANP application can be divided into seven main steps [2,11]:

1. Creating a network that consists of elements grouped in clusters and determining the relationship between the network elements (Fig. 1).
2. Creating pairwise comparison matrices of elements and calculation of their eigenvectors (This step is closely explained in the section below).
3. Generating an unweighted supermatrix from eigenvectors calculated in the previous step.
4. Creating pairwise comparison matrices of clusters and calculation of their eigenvectors (This step is closely explained in the section below).
5. Generating a weighted supermatrix by multiplying the blocks of the unweighted supermatrix by the corresponding weights of the clusters – columns of supermatrix become stochastic.
6. Generating a limit supermatrix by raising the weighted supermatrix to the power $2k + 1$, where k is an arbitrary natural number – the weights of the supermatrix begin to converge and stay constant.
7. Final synthesis performed by normalization of the weights of alternatives from the limit supermatrix.

Fig 1: Network of the ANP




Source: [11]

Let us clarify the 2nd and 4th step related to the process of creating pairwise comparison matrices. This process is made in the same manner as in the AHP method and can be divided into following three parts:

1. Creating a pairwise comparison matrix.
2. Calculation of the matrix eigenvector.
3. Calculation of the matrix consistency.

*Creating a pairwise comparison matrix*

This part is based on an attribution of points $a_{ij}$ $(i, j = 1,2, \dots n)$ to each pairwise comparison based on the degree of their importance. These points indicate difference between two elements of the dependent level with respect to the parent level of the hierarchy [1].

The assessment of the degree of importance is established by the so-called 'expert estimation'. In the AHP and ANP the assigned values are selected either from the basic five-point scale, or from the more popular 9-point scale (Tab. 1) [9]. The aforementioned Saaty's 9-point scale includes points from 1 to 9 and these reflect how much one element is more important than the other. If the two compared elements have the same importance, we assign 1 point to such comparison, if there are vast differences in the importance, we assign the highest possible score of 9 points to this comparison [8]. Subsequently the points assigned to the pairwise comparisons $a_{ij}$ are then written in the pairwise comparison matrix A (1) and at the same time the condition $a_{ij} = 1/a_{ji}$ must be satisfied [3,6].

$$A = \begin{pmatrix} a_{11} & \dots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{n1} & \dots & a_{nn} \end{pmatrix} \quad (1)$$

Tab 1: Table of the importance points.

| Importance points | Definition | Explanation |
|---|---|---|
| **1** | Equal importance | Both pairwise comparison elements have equal importance with regards to the goal |
| **3** | Moderate importance | First element of a pairwise comparison is subtly more important than the other |
| **5** | Strong importance | First element is much more important than the other |
| **7** | Very strong importance | First element is demonstrably more important than the other |
| **9** | Extreme importance | First element is absolutely more important than the other |
| **2, 4, 6, 8** | | These points are used to express marginal importance |

Source: [9]

*Calculation of the matrix eigenvector*

In the second part, the weights of the compared elements from the created pairwise comparison matrices are determined on the basis of the following relation $Aw = \lambda_{\max} w$, where $w$ is the eigenvector of weights, $A$ is a matrix of pairwise comparisons and $\lambda_{\max}$ is the maximum eigenvalue. [9,12].

*Calculation of the matrix consistency*

Each pairwise comparison matrix must meet the condition of consistency, which states the plausibility of each pairwise comparison. If the matrix is fully consistent, condition $a_{ik} = a_{ij}.a_{jk}\ (i,j,k = 1,2,\dots n)$ is satisfied. Since this situation occurs very rarely in practice, the consistency test was introduced [7]. There are two parameters we recognize in the consistency test, namely the consistency index (CI) and the consistency ratio (CR). We determine them as follows

$$\mathrm{CI} = \frac{\lambda_{\max} - n}{n-1},$$

$$\mathrm{CR} = \frac{\mathrm{CI}}{\mathrm{RI}},$$

where RI is a random index, which has different values for different numbers of the compared criteria or alternatives in matrix (Tab. 2). If CR is less than 0,1; then the matrix is consistent and the result of the comparison is acceptable. Otherwise it is necessary to return to step 2 and re-create the pairwise comparison matrix with the unsuitable CR [9,12].

Tab 2: Relationship between the RI and the number of compared elements

| n | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|
| RI | 0,58 | 0,90 | 1,12 | 1,24 | 1,32 | 1,41 | 1,45 |

Source: [7]

## Application of the Analytic Network Process

In this section we explain the process of application of the ANP method on our model scenario, in which we want to fill a vacant position in a company. Let us to clarify and define the goal, the criteria and the alternatives.

After drawing up the requirements defining a job vacancy and subsequent publishing the job offer, multiple applicants responded, who were later reduced to three candidates. These candidates proceed to the interview phases, within which they were tested and evaluated by the human resource managers in several aspects. Now, our goal is to make a decision which candidate best meets the criteria defining vacant job position, on the basis of the ANP method and mentioned candidate's information.

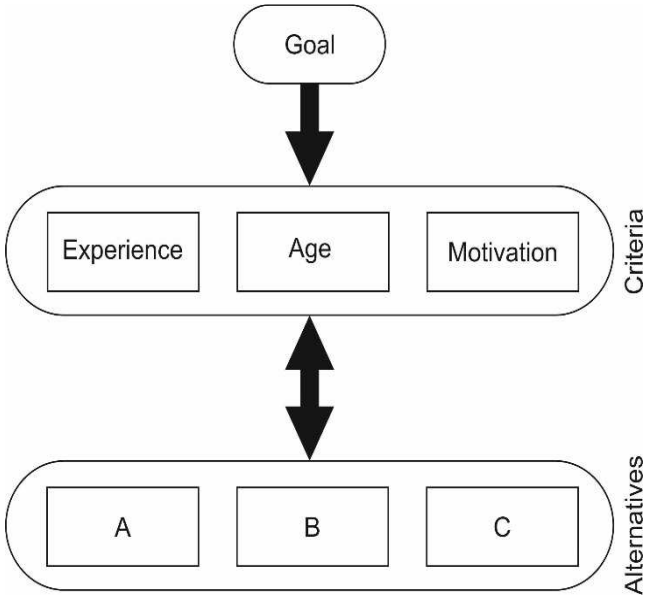
Alternatives: these are candidates A, B and C; among which we need to select the best alternative.

Criteria: these are the conditions determining the most suitable candidate. In our case these are: *experience*, *age*, *motivation.*

Goal: selection of the best candidate.

Now that we already identified the goal, the criteria and the alternatives, we can move on to the ANP application itself. As a first, it is necessary to create a network of our model scenario (Fig. 2). The elements *experience*, *age* and *motivation* are the nodes of the Criteria cluster; and the elements A, B and C are in turn the nodes of the Alternatives cluster.

Fig 2: Network of the scenario




Source: Own processing

After constructing a network, we can proceed to creation of the pairwise comparison matrices. First, we will create these matrices in the classic top-down direction (Tab. 3 – 6).

Tab 3: Pairwise comparison matrix of the criteria with respect to the goal

| **Goal** | **Experience** | **Age** | **Motivation** | **Weights** |
|---|---|---|---|---|
| **Experience** | 1 | 3 | 1/2 | 0,309 |
| **Age** | 1/3 | 1 | 1/5 | 0,109 |
| **Motivation** | 2 | 5 | 1 | 0,582 |

Source: Own processing

Tab 4: Pairwise comparison matrix of the alternatives with respect to the criterion *experience*

| **Experience** | **A** | **B** | **C** | **Weights** |
|---|---|---|---|---|
| **A** | 1 | 2 | 2 | 0,493 |
| **B** | 1/2 | 1 | 1/2 | 0,196 |
| **C** | 1/2 | 2 | 1 | 0,311 |

Source: Own processing

Tab 5: Pairwise comparison matrix of the alternatives with respect to the criterion *age*

| **Age** | **A** | **B** | **C** | **Weights** |
|---|---|---|---|---|
| **A** | 1 | 3 | 1/3 | 0,230 |
| **B** | 1/3 | 1 | 1/9 | 0,077 |
| **C** | 3 | 9 | 1 | 0,692 |

Source: Own processing

Tab 6: Pairwise comparison matrix of the alternatives with respect to the criterion *motivation*

| **Motivation** | **A** | **B** | **C** | **Weights** |
|---|---|---|---|---|
| **A** | 1 | 2 | 2 | 0,500 |
| **B** | 1/2 | 1 | 1 | 0,250 |
| **C** | 1/2 | 1 | 1 | 0,250 |

Source: Own processing

From the network in (Fig. 2) we can see, that besides the dominance in the top-bottom direction we have also incorporated the reverse effects in the bottom-top direction. For this reason, we have to create additional pairwise comparison matrices expressing the criteria comparisons with respect to the candidates (Tab. 7 – 9).

Tab 7: Pairwise comparison matrix of the criteria with respect to the candidate A

| A | Experience | Age | Motivation | Weights |
|---|---|---|---|---|
| **Experience** | 1 | 4 | 4 | 0,345 |
| **Age** | 1/4 | 1 | 1 | 0,547 |
| **Motivation** | 1/4 | 1 | 1 | 0,108 |

Source: Own processing

Tab 8: Pairwise comparison matrix of the criteria with respect to the candidate B

| B | Experience | Age | Motivation | Weights |
|---|---|---|---|---|
| **Experience** | 1 | 1/5 | 1/3 | 0,110 |
| **Age** | 5 | 1 | 2 | 0,581 |
| **Motivation** | 3 | 1/2 | 1 | 0,309 |

Source: Own processing

Tab 9: Pairwise comparison matrix of the criteria with respect to the candidate C

| C | Experience | Age | Motivation | Weights |
|---|---|---|---|---|
| **Experience** | 1 | 2 | 1/3 | 0,222 |
| **Age** | 1/2 | 1 | 1/6 | 0,111 |
| **Motivation** | 3 | 6 | 1 | 0,667 |

Source: Own processing

Let us note that all partial weights entered in the last columns of the above matrices (Tab. 3 – 9) were obtained through online software, available on the internet website (http://www.isc.senshu-u.ac.jp/~thc0456 /EAHP/AHPweb.html). Also we note that all pairwise comparison matrices met the condition of consistency.
Now we can move to the acquisition of the final weights. First, we enter all pairwise comparison matrices (Tab. 3 – 9) in the SuperDecisions 2.2.6 freeware (available on the website http://www.superdecisions.com/super-decisions-download-page), by which we create one unweighted supermatrix (Tab. 10).

Tab 10: Unweighted supermatrix

| | Goal | Experience | Age | Motivation | A | B | C |
|---|---|---|---|---|---|---|---|
| **Goal** | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 |
| **Experience** | 0,309 | 0,000 | 0,000 | 0,000 | 0,345 | 0,110 | 0,222 |
| **Age** | 0,109 | 0,000 | 0,000 | 0,000 | 0,547 | 0,581 | 0,111 |
| **Motivation** | 0,582 | 0,000 | 0,000 | 0,000 | 0,108 | 0,309 | 0,667 |
| **A** | 0,000 | 0,493 | 0,230 | 0,500 | 0,000 | 0,000 | 0,000 |
| **B** | 0,000 | 0,196 | 0,077 | 0,250 | 0,000 | 0,000 | 0,000 |
| **C** | 0,000 | 0,311 | 0,693 | 0,250 | 0,000 | 0,000 | 0,000 |

Source: Own processing

Now, it is necessary to create a weighted supermatrix from the unweighted supermatrix. That means we multiply the blocks of the unweighted supermatrix by corresponding weights of the clusters. Since in our case the clusters have no inner dependence (there is no inner relationship in the Alternatives and Criteria clusters) but only between-cluster dependence (Alternatives – Criteria and Criteria – Alternatives), the weighted supermatrix will be identical to the unweighted one.
Now we can move to generating a limit supermatrix by the SuperDecisions 2.2.6 software (Tab. 11).

Tab 11: Limit supermatrix

| | **Goal** | **Experience** | **Age** | **Motivation** | **A** | **B** | **C** |
|---|---|---|---|---|---|---|---|
| **Goal** | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 |
| **Experience** | 0,126 | 0,126 | 0,126 | 0,126 | 0,126 | 0,126 | 0,126 |
| **Age** | 0,183 | 0,183 | 0,183 | 0,183 | 0,183 | 0,183 | 0,183 |
| **Motivation** | 0,191 | 0,191 | 0,191 | 0,191 | 0,191 | 0,191 | 0,191 |
| **A** | 0,200 | 0,200 | 0,200 | 0,200 | 0,200 | 0,200 | 0,200 |
| **B** | 0,087 | 0,087 | 0,087 | 0,087 | 0,087 | 0,087 | 0,087 |
| **C** | 0,214 | 0,214 | 0,214 | 0,214 | 0,214 | 0,214 | 0,214 |

Source: Own processing

Finally, we execute the synthesis of the final weights by normalizing any column of the limit supermatrix by blocks (clusters). An overview of the weights obtained after the final synthesis can be found in the following table (Tab. 12).

Tab 12: Final weights

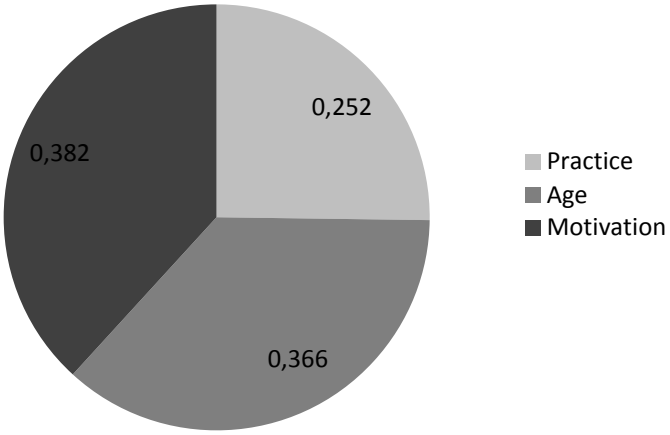
| | **Column normalized by the clusters** | **Column from the limit supermatrix** |
|---|---|---|
| **Experience** | 0,252 | 0,126 |
| **Age** | 0,366 | 0,183 |
| **Motivation** | 0,382 | 0,191 |
| **A** | 0,399 | 0,200 |
| **B** | 0,173 | 0,087 |
| **C** | 0,427 | 0,214 |

Source: Own processing

### *Evaluation of the obtained results*

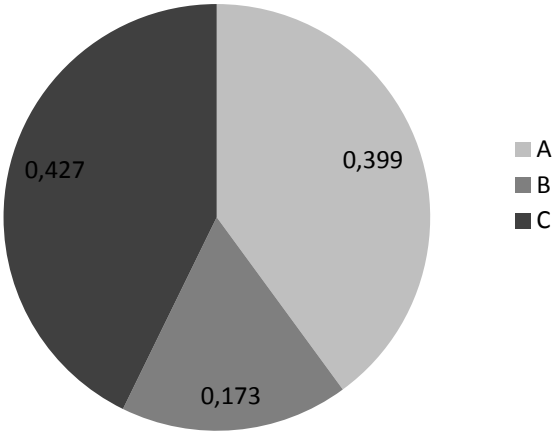
For the sake of a better overview and comparison of the results, we create following graphic presentation (Fig. 3 – 4) from weights normalized by clusters (Tab. 12, column 1).

Fig 3: Graphic presentation of the criteria weights




Source: Own processing

Fig 4: Graphic presentation of the alternatives weights




Source: Own processing

We can see from the results (Fig. 3) that the most important criterion was the *motivation* (0.382), followed by the *age* (0,366) and the third was the *experience* (0.252). Regarding the alternatives (Fig. 4), the most preferred candidate was the candidate C (0.427) with 4% ahead of the candidate A (0.399). On the third position was the candidate B (0.173), with more than 20% loss on the top two candidates.

## Conclusion

Human resource managers can use a variety of multi-criteria decision making methods, such as Analytic Network Process (ANP), to facilitate and support decision making. Therefore, we focused on the application of the ANP on a general model scenario in this article, in which a company chooses among three candidates for the same position. From the results obtained by this method we can conclude that the ANP method seems to be appropriate and effective tool for evaluating the qualities of candidates.

In this article, the applicability of the multi-criteria decision making methods in the area of employee selection was confirmed. We began to solve this problem for the first time in an article [5], where we have successfully used the Analytic Hierarchy

Process (AHP) for the process of evaluating candidates. Therefore, it is clear that the application of the AHP and ANP on decision making problems in human resource management leads to the acquisition of effective decision making frameworks. For this reason, we recommend the use and adoption of the above evaluation methods to human resource managers. The results of this research will be used as a basis for further applicability testing of the AHP and ANP methods on realistic scenarios of employee selection.

## Záver

Na uľahčenie a podporu rozhodovania, môžu manažéri ľudských zdrojov využiť rôzne viackriteriálne rozhodovacie metódy, ako napríklad Analytický sieťový proces (ANP). Preto, sme sa v tomto článku zamerali na aplikáciu ANP na modelovú situáciu, v ktorej sa spoločnosť rozhoduje medzi troma kandidátmi pri obsadení istej pracovnej pozície. Z výsledkov získaných touto metódou môžeme konštatovať, že ANP sa javí ako vhodný a efektívny nástroj vyhodnocovania kvalít kandidátov.
Týmto článkom bola potvrdená vhodnosť využitia viackriteriálnych rozhodovacích metód v oblasti výberu zamestnancov. Túto problematiku sme prvý krát začali riešiť už v článku [5], kde sme na proces vyhodnotenia kandidátov úspešne použili metódu Analytický hierarchický proces (AHP). Je teda zjavné, že aplikovanie AHP a ANP na rozhodovacie problémy v oblasti manažmentu ľudských zdrojov vedie k zisku účinných rozhodovacích rámcov a z tohto dôvodu odporúčame manažérom používanie a osvojenie si spomínaných vyhodnocovacích metód. Výsledky tohto výskumu budú použité ako podklady pre ďalšie testovania aplikácie AHP a ANP na reálne scenáre výberu zamestnancov.

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# COLLAR AGREEMENTS IN CROSS–BORDER MERGERS & ACQUISITIONS

# VYUŽITIE ZABEZPEČOVACÍCH DOHÔD TYPU COLLAR PRI CEZHRANIČNÝCH FÚZIÁCH A AKVIZÍCIÁCH

***Abstract:*** *Mergers and acquisitions (M&A) plays an important role in global economies by allowing companies to reshape themselves in response to a changing economy. Divesting some lines of business and acquiring others allows companies to enter new markets, access distribution channels, develop new technologies, and release capital for reinvestment. For small, innovative companies in particular, M&A is a way to match their new ideas with the resources needed to bring them to market. Today's volatile foreign exchange environment contributes to a growing role for collars in cross-border deals. In this paper, we discuss collar agreements, that can be used to manage risks arising in cross-border M & A practice.*
***Key words:*** *Cross-border acquisition, Cross-border merger, Collar.*

***Kľúčové slová:*** *cezhraničná akvizícia, cezhraničná fúzia, zabezpečovací nástroj typu collar.*

**JEL:** G32, G34

*This paper was compiled as a part of the projects VEGA No. 1/0173/15 "Analytical view of aspects determined the development of cross-border mergers and acquisitions in the European area".*

## Introduction

In a dynamic economy, companies must frequently adjust their operations in response to the changing market place to better serve customers, respond to technological change, and compete. One way companies do this is by divesting some business units and acquiring others.

Mergers, acquisitions, divestitures, spin-offs, and other activities that change the scope and focus of a company's business are all examples of business reconfigurations. These business reconfigurations are an important tool, particularly for companies in innovative, high-growth sectors, because they may need to adjust to rapidly changing markets. Being able to divest some business units and acquire others allows companies to more quickly gain access to newly developing technologies and markets.

Like other business reconfigurations, M & A may produce many economic benefits including: creating business synergies that may increase the value of the combined companies, providing financial gains to both the acquirer and target, releasing

capital for reinvestment, and helping ensure that capital is more efficiently allocated throughout the economy.
M&A creates economic value when it combines two companies that are worth more together than they are apart. This additional value comes from the "synergies" created by the reconfiguration. Synergies can come from many sources. One clear example of synergy is a start-up company with innovative proto-type products being sold to a mature company with the manufacturing and distribution capabilities needed to make those proto-types commercially successful. Neither company would be as valuable alone as the two are together.
The benefits of M & A are typically shared by both acquirer and target. The acquirer gains valuable assets and the seller of the target shares in the profit from the synergies through the price premium it receives from the acquirer over the target's standalone market value.
Cross-border M & A typically produces larger synergies because of the greater "gains from trade" available for companies from different countries. Companies from different countries may have access to different stocks of local know-how, product types, specialized suppliers, workforces, and capital markets, all of which can have an important influence on companies' competitive capabilities. The greater synergies in cross-border M & A are reflected in larger price premiums paid to shareholders of the target.
Today's volatile foreign exchange environment contributes to a growing role for collars in cross-border deals. Although there exists extensive literature on M & A in general, the literature on collar offers is scarce. In this paper, we discuss collar agreements, that can be used to manage risks arising in cross-border M & A practice.

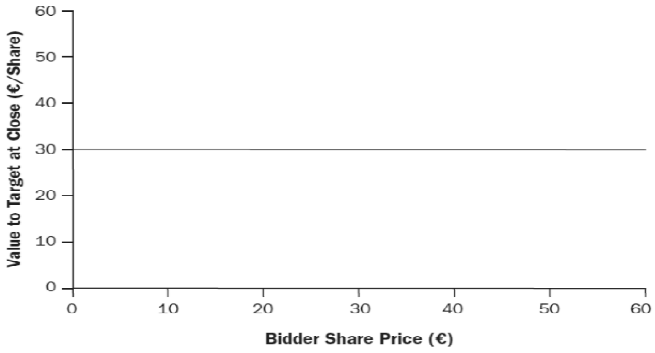
**Collar agreements in cross-border M&A**

Historically, the fundamental decision to use stock or cash as the form of consideration in any M & A transaction has been a business decision to be made by the prospective purchaser and target companies, with the consultation of their respective investment bankers and tax and legal advisors, and typically has been related to many factors, including the need for certainty of ownership split or deal value or level of dilution, the availability of financing and its cost, the tax basis of any controlling holders of target stock and the desirability and anticipated performance of the purchaser's stock (Spatt, 2013).
In all-stock or mixed consideration transactions, there are inherent risks on both sides that the agreed upon value may vary, sometimes substantially, between the signing and closing of the transaction as a result of changes in the price of the purchaser's stock. Such risks must be dealt with (or at least considered) in the pricing mechanism chosen for the transaction.

M & A risks can be divided into two classes: pre-closing and post-closing. In the category of pre-closing instruments, offers with "collars" can provide managers of publicly traded target companies with an effective way out in case of material share price fluctuations. Such instruments can also be used by bidders to cap the payout to selling shareholders (by using "fixed" collar offers) or to limit the dilution of selling

shareholders' claims (using "floating" collar offers) resulting from the deal. Post-closing instruments, which include earn-outs and contingent value rights (or CVRs) - can be used to manage the risk of substandard performance and the overpayment that would result from underperformance.
Collars were introduced to protect against extreme price fluctuations in the equity prices of bidder and target in stock M & As. M & A collars are not financial instruments. They are contractual agreements that tailor the economics of consideration in stock-based M&A transactions beyond the simple choices of a fixed-price or fixed exchange ratio agreement.
In an ***all – cash deal*** (Figure 1), consideration is independent of any changes in bidder (or target) share price. Targets may benefit from cash offers because they face no risk that consideration will decline as a result of "adverse" movements in their own, or the bidder's, share price (i.e., target appreciation, or bidder depreciation). Bidders may benefit from cash offers because they face no risk that consideration will increase from any "adverse" movements in their own, or the target's, share price (Adolph, Pettit, 2007).

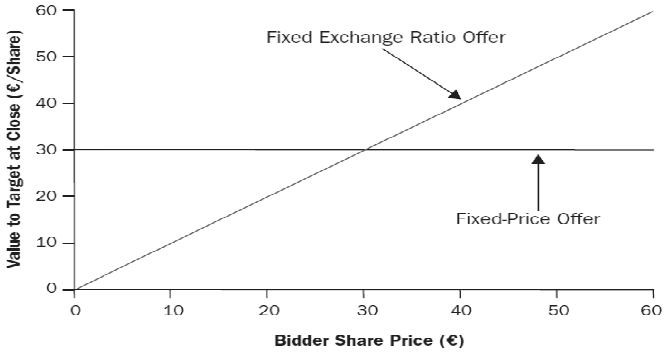
Figure 1: Consideration as a Function of Changes in Bidder Share Price – Cash Offer




Source: Adolph, Pettit, 2007

A ***fixed exchange ratio transaction*** is one in which the purchaser and the seller agree at the time of signing on a specified ratio at which the parties' respective stock will exchange. The fixed ratio mechanism is frequently used in merger of equals transactions and large transactions generally where the business deal and valuation is more focused on fixing the ownership split of the resulting company between the two constituencies based on fundamentals, rather than on the possible deviations in trading value that market movements in the purchaser's stock will engender. It allows the purchaser to determine precisely how much stock it will issue in the transaction at the outset.
A fixed exchange ratio stock deal is the sloped line in Figure 2. Target shareholders receive a certain number of bidder shares in exchange for each share of target stock.

Figure 2: Consideration as a Function of Changes in Bidder Share Price – Equity Offers



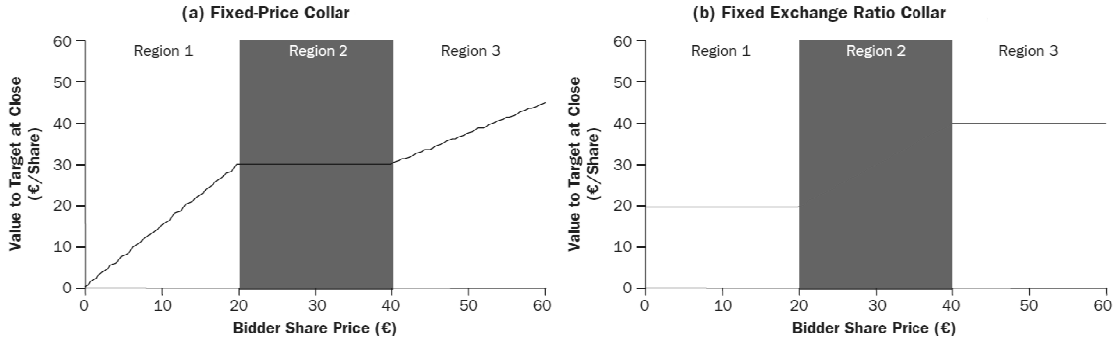

Source: Adolph, Pettit, 2007

Consideration to the target is a function of changes in both bidder and target share prices. Bidders may benefit from fixed exchange ratio offers because they exchange a fixed percentage of ownership, regardless of whether their stock price declines or the target appreciates. Targets may benefit from a fixed exchange ratio offer because they exchange a fixed percentage of ownership, regardless of stock price movement. Although a fixed ratio is simpler, the value of the transaction will fluctuate based upon changes in the value of the purchaser's stock (i.e., as the value of the purchaser's stock increases, the target's stockholders receive greater value for their shares and vice versa). To protect the seller's stockholders from a decline in the purchaser's stock price (and the purchaser's stockholders from having to issue shares in aggregate exceeding the target's value in the case where the purchaser's stock price increases following announcement), the parties can agree to include collar features in the pricing mechanism. In such cases, the seller's stockholders would receive a fixed number of shares of the purchaser's stock unless the price of the purchaser's stock falls or rises beyond the specified collar range during the valuation period. If the purchaser's stock price moves outside of the specified collar range during the valuation period, there would be, within limits, an adjustment in the number of shares of the purchaser's stock to be delivered to the seller's stockholders. It should be noted that if the transaction is a mixture of cash and stock, the cash portion of the consideration already serves to mitigate the value impact arising from movements in the purchaser's stock price.
Collars tailor stock-based consideration arrangements that may draw characteristics from either fixed exchange ratio or fixed-price deal economics, both in terms of risk and economics. There are two basic types of collar that may serve as building blocks for an endless number of possible permutations.

***Fixed – price collars*** are the most common; price is fixed within the collar boundaries (Region 2 of Figure 3a). The bidder guarantees a price, within a range of bidder stock price to target stock price ratios — the "width" of the collar. If the bidder price falls, or target rises, below the lower bound, consideration is based on the exchange ratio in Region 1. If the bidder price rises above the upper bound, or target declines, the target is paid according to the exchange ratio of Region 3.

In the ***fixed exchange ratio collar***, the exchange ratio is fixed within the collar boundaries (Region 2 in Figure 3b). The bidder guarantees a fixed number of shares to the target within a range of bidder stock price to target stock price ratios — the width of the collar. If the bidder price falls, or target rises, below the lower bound, consideration is a fixed price equal to Region 1. If the bidder price rises, or target declines, above the upper bound, consideration equals the fixed price of Region 3 (Adolph, Pettit, 2007).

Figure 3: Fixed – Price and Fixed Exchange Ratio Collars




Source: Adolph, Pettit, 2007

In both cases, the initial value and risk of either collared offer is somewhere between a pure fixed exchange and a fixed-price offer. Depending on objectives, constraints, and risk utilities, a deal may be tailored beyond these simple payoff functions.

From a management standpoint, it is clear that the described contractual structures have the potential to offer a significant competitive advantage in a takeover battle. The existing literature on market practice reveals that collar offers are used more frequently in the financial services industries, largely because regulatory capital requirements favor the use of stock as a means of payment. In particular, floating collar offers provide the target shareholders with greater certainty about the per share payment, while at the same time preserving the financial flexibility of the bidder.

Interestingly, empirical analysis suggests that the use of collars has the effect of reducing the negative abnormal stock returns typically experienced by bidders in stock-for-stock offers. These findings suggest, that a floating-collar offer is interpreted by the market as a signal of the bidder's management's confidence in its company's value.

By effectively managing dilution and overpayment (and underpayment) risks, a collar offer allows the bidder's management to be more aggressive in its pricing of a stockfor-stock deal and hence be a competitive player in a battle for control. A fixed collar offer is more attractive when target shareholders are willing to accept a certain amount of uncertainty about the consideration received. Floating collars, by contrast, are likely to be more effective when dealing with a significantly risk-averse investor clientele, since they effectively guarantee a fixed price per share provided the bidder's price stays within the specified range (Caselli, Gatti, 2006).

The following Table 1 summarizes the advantages and disadvantages of Alternative Collar Agreements.

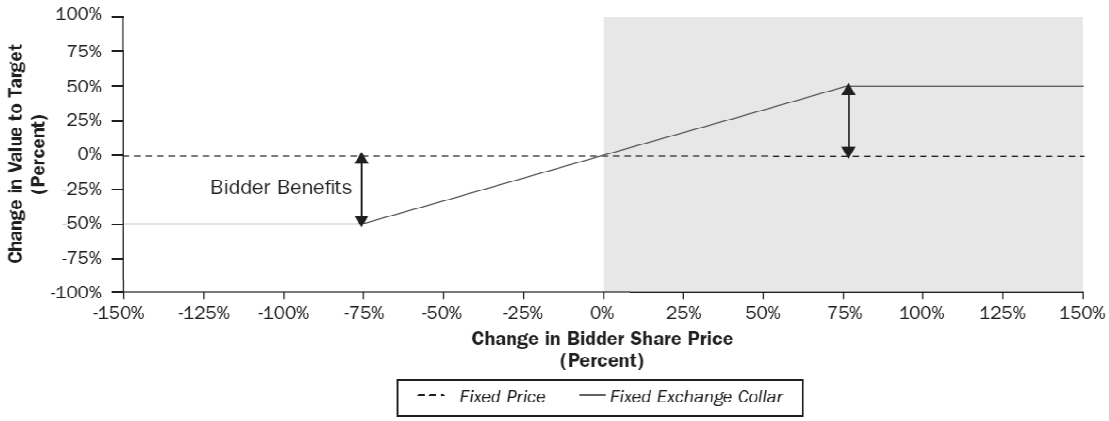
Table 1: Advantages and disadvantages of Alternative Collar Agreements

| Agreement Type | Advantages | Disadvantages |
|---|---|---|
| **Fixed Share Exchange Agreement** | *Bidder company:* Number of acquirer shares to be issued known with certainty; minimizes potential for overpaying.<br>*Target company:* Share exchange ratio known with certainty. | *Bidder company:* Actual value of transaction uncertain until closing; may necessitate renegotiation.<br>*Target company:* Actual value of transaction uncertain until closing; may necessitate renegotiation. |
| **Fixed Value Agreement** | *Bidder company:* Transaction value known; protects acquirer from overpaying<br>*Target company:* Transaction value known; prevents significant reduction in purchase price due to acquirer share price variation. | *Bidder company:* Number of acquirer shares to be issued uncertain.<br>*Target company:* May have to reduce purchase price to get acquirer to fix value. |
| **Floating Collar Agreement** | *Bidder company:* Perfect risk management of the cash value of the consideration paid; abandon option outside of negotiated bounds.<br>*Target company:* Guaranteed cash value of the medium of exchange; abandon option outside of negotiated bounds. | *Bidder company:* Sub-optimal dilution risk management.<br>*Target company:* Uncertainly regarding the pro-forma ownership structure. |
| **Fixed Payment Collar Agreement** | *Bidder company:* Reduces uncertainty about transaction value and potential for renegotiation.<br>*Target company:* Reduces uncertainty about transaction value and potential for renegotiation. | *Bidder company:* Price risk management sub-optimal in presence of small relative movements of bidder vs. target share prices.<br>*Target company:* Price risk management sub-optimal in presence of small relative movements of bidder vs. target share prices. |

Source: Own elaboration

Once an agreement has been reached, the collar *allocates* value based on the structure and market conditions. For example, in the case of a fixed exchange ratio collar (Figure 4), the target "benefits" (as opposed to what happens in fixed-price consideration) from an increase in the bidder's share price, whereas the bidder "benefits" in the event of its own share price decline.

Figure 4: Fixed Exchange Ratio Collar Illustration




Source: Adolph, Pettit, 2007

## Expected Utility of Collar Offers

Chen and Hilpert (2014) analyzed the Collar contracts from an expected utility perspective, that is, the shareholders of the target company follow the power-utility function:

$$u(x) = \frac{1}{1-\gamma} x^{1-\lambda}, \ \gamma > 0, \ \gamma \neq 1 \qquad (1)$$

for wealth x. For numerical work they used the payoff's certainty equivalent (CE) defined by:

$$u(CE) = E[u(x)] \qquad (2)$$

Here x will be the payoff to the target which varies with each contract specification. The use of CE makes the quantities easier to interpret, because the CE expresses expected utility in monetary units instead of utility units. This transformation allows to compare decisions from di_erence preferences with each other, because the CE is independent of the utility scaling. The expected utility is determined under the real world measure P under which the assets follow:

$$dS_1(t) = (\mu_1 - q_1)\, S_1(t)dt + \sigma_1 S_1(t) dW_1^P(t) \qquad \text{with } S_1(0) = S_1$$
$$dS_2(t) = (\mu_2 - q_2)\, S_2(t)dt + \sigma_2 S_2(t)(\rho dW_1^P(t) + \sqrt{1-\rho^2 dW_2^P(t)}) \qquad \text{with } S_2(0) = S_2 \qquad (3)$$

where $\mu_1$ and $\mu_2$ are instantaneous rate of return of bidder's and target's asset. $W_1^P$ and $W_2^P$ are two independent Brownian motions under P.

Expected utility of Collars for the utility function (1) is for a Fixed Price Collar:

$$E^P[u(\psi_{FP})] = \frac{1}{1-\gamma}\left[ aS_{1e}^{(\mu_1 - q_1 - \frac{\sigma_1^2}{2})T} \right]^{1-\gamma} e^{\frac{1}{2}(1-\gamma)^2\sigma_1^2 T}\Phi\left(\tilde{L} - (1-\gamma)\sigma_1\sqrt{T}\right)$$
$$+\frac{1}{1-\gamma}K^{1-\gamma}\left[\Phi(\tilde{U}) - \Phi(\tilde{L})\right] + \frac{1}{1-\gamma}\left[ bS_{1e}^{(\mu_1 - q_1 - \frac{\sigma_1^2}{2})T} \right]^{1-\gamma} e^{\frac{1}{2}(1-\gamma)^2\sigma_1^2 T}\Phi\left(-\tilde{U} + (1-\gamma)\sigma_1\sqrt{T}\right) \quad (4)$$

Expected utility of Collars for the utility function (1) is for Fixed Ratio Collar:

$$E^P[u(\psi_{FP})] = \frac{1}{1-\gamma}K_1^{1-\gamma}\Phi(\tilde{L}) + \frac{1}{1-\gamma}K_2^{1-\gamma}\Phi(-\tilde{U}) + \frac{1}{1-\gamma}\left[ cS_{1e}^{(\mu_1 - q_1 - \frac{\sigma_1^2}{2})T} \right]^{1-\gamma} e^{\frac{1}{2}(1-\gamma)^2\sigma_1^2 T} \quad (5)$$
$$\left[\Phi\left(\tilde{U} - (1-\gamma)\sigma_1\sqrt{T}\right) - \Phi\left(\tilde{L} - (1-\gamma)\sigma_1\sqrt{T}\right)\right]$$

$$\tilde{L} = \frac{\ln\left(\frac{L}{S_1}\right) - (\mu_1 - q_1 - \frac{\sigma_1^2}{2})T}{\sigma_1\sqrt{T}}, \quad \tilde{U} = \frac{\ln\left(\frac{U}{S_1}\right) - (\mu_1 - q_1 - \frac{\sigma_1^2}{2})T}{\sigma_1\sqrt{T}}$$

## Conclusion

Although the use of M&A risk management instruments is still relatively limited in international financial markets, recent increases in stock market volatility have increased the likelihood they will be used in the future. We can classify such instruments into two categories: (1) instruments for managing "pre-closing" risks, notably the changes in bidder's stock price that can end up affecting the terms of the deal; and (2) "contingent value" instruments that guard against the risk of overpayment by making the price of the deal contingent on post-close performance of the target. In the first category of instruments, collars provide bidder and target companies with a means of limiting dilution and price risk, which in turn reduces ex post negotiation costs and gives the managers of both companies an easy way out in case of material share price fluctuations.


## Súhrn

Napriek tomu, že využitie nástrojov pre riadenie rizika pri fúziách a akvizíciách je na medzinárodných finančných trhoch stále relatívne obmedzené, nedávny nárast volatility na kapitálových trhoch zvýšil pravdepodobnosť ich využitia v budúcnosti. Tieto nástroje možno klasifikovať do dvoch kategórií: (1) nástroje pre riadenie rizika pred uzatvorením zmluvy, najmä zmeny cien ponúkaných akcií, ktoré môžu ukončiť následné ovplyvňovanie podmienok obchodu; a (2) nástroje contingent value. V prvej kategórii nástrojov, zabezpečovacie nástroje typu collar poskytujú kupujúcim i predávajúcim prostriedok na zníženie cenového rizika, čo následne znižuje ex post náklady na vyjednávanie a dáva manažérom oboch spoločností jednoduchý spôsob zabezpečenia sa pre prípad fluktuácie cien akcií.

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# CREATIVE METHODS IN MANAGEMENT EDUCATION FROM STUDENTS' PERSPECTIVE

# KREATÍVNE METÓDY VO VZDELÁVANÍ MANAŽÉROV Z POHĽADU ŠTUDENTOV

***Abstract:*** *The aim of this article is to present students' views on methods applied in education and their perception of creative games and techniques applied on the on the course "Creative methods in management and managerial games" (CMM&MG), which is part of the Master's curriculum at the Faculty of Management. Primary data collection was conducted through a questionnaire survey among students attending the course in academic year 2014/2015. Using a factor analysis a large set of observed variables was reduced to five factors. In the context of reduced factors, the attention was focused on the two extracted factors: "Attractiveness of methods applied on the CMM&MG course and during the study" a "The demand for creative and innovative methods in education".*
***Key words:*** *creativity, education, management, methods*

***Kľúčové slová:*** *kreativita, vzdelávanie, manažment, metódy*

**JEL: A22, I23**

## Introduction

Creativity is considered as a determining factor of the success of businesses and organization because it significantly affects the development of innovation and ingenuity, and consequently the business success and profit. In the world with increasing populations and decreasing natural resources is creativity together with knowledge considered the most important economic resource [3].

The particular importance of creativity in business and management is growing, as evidenced by the formation and development of concepts related to creativity, particularly the creative economy, creative industries, creative tourism, creative products, creative cities, creative classes, etc. [10].

## Creativity in organisational context

Enterprises currently devote much attention to promoting creativity as a source of competitive advantage, which is closely related to the employees' ability of to be innovative and creative.

This – according to Ageyev (2008 a 2010, in Hayel Al-Sroura a Al-Oweidi) [5] – encourages organizations to develop concepts and apply management styles leading to the creation of a creativity-supportive environment. An interactive environment

contributes to interconnection and transfer of knowledge and accumulated gained experience in order to develop creativity to ensure the maximum development of an organization. With regard to the management styles Powell [9] points out the need of managers/leaders to apply styles that are unique and based on consensus, adaptation, responsiveness and speed of decision making. The author also emphasizes that organizations should not only be introspective (i.e. reflecting internal and external context), but also progressive, i.e. able to think strategically about the possibilities for stakeholders – clients, customers and employees - to increase the overall creative ability of the organization.

The essence of organizational creativity according Houman Andersen and Kragh [6, p. 82] is that managers and employees to fundamentally challenge existing ways of doing things within organizations. "Developing creativity is about exploring new possibilities and following what may often be vague ideas or hunches".

Bilton [2] divides the perceptions of creativity in business into two categories: (1) the „heroic" model which highlights the impact of a dynamic, visionary creative individual on the firm (usually associated with transformational i.e. visionary, charismatic leadership and with an individualistic theory of creativity) and (2) the „structural" model which gives emphasis on
teams, networks and organisational environments as sources of innovation and fits more comfortably with traditional management models and concepts.

There is discord and disunity in the views on what actually fosters and inhibits creativity in organizations. The greatest barriers of creativity are considered to be: bureaucracy and restrictive routines, excessive control, passivity, anxiety and fear, time stress etc. As aptly comments Augsdorfer [1] even after 40 years of research the discussion on how to manage for true creativity and innovation persist, while some authors advocate structure, planning and control, others advocate greater creative freedom and a "laissez-faire" management approach and some people prefer a combination of leadership strategies. Regardless of preferred approach, the fact is that creativity is crucial for the development, success and competitiveness of businesses.

**Creativity in the context of higher (management) education**

Given that creativity is considered to be economic growth stimulator there is a pressing need for "creative thinkers in every field" [4, p. 47] i.e. in all disciplines and fields of the economy, including management. Moreover, given the increasing volume and importance of the creative industries (culture, arts, architecture, design, film, fashion etc.) it is not surprising that there is an increasing demand for graduates with imagination and creativity.

Craft (as cited in Gustina and Sweet) [4, p. 49] highlights the dynamic relationship between education and "world of employment and the wider economy" which changed the point of view of "what is considered significant in terms of educational achievement". In this context author underlines the critical role of creativity for

surviving and thriving while emphasizes that to have "merely excellence in depth and grasp of knowledge" is no longer sufficient for success. Gustina and Sweet [4, p. 47] are inclined to this view and argue that "the current calls for more creative output throughout the economy acknowledge education as the most promising locus for developing creativity". According Ng'ang'a and Otii [7] university graduates - future employees and eventually managers of enterprises and firms are expected to have creative abilities which they can exploit in the working life and subsequently change in the work environment.

In relation to management education Oltra and Escriba´-Esteve [8] point out that fully practical training activities and "learning by doing" that enable students to acquire managerial competences for fulfilling high-responsibility roles in business are unfortunately scarce in most university curricula. The authors used active learning initiatives to promote creativity-related competences among management students.

The task of universities and educational institutions is to adjust and involve the development of creativity in the curriculum so that they can reflect on this fact. There are many voices (organizations, government, policymakers etc.) calling for the need of students' creativity development and incorporation of methods and techniques enhancing creativity in the curriculum. Faculty of Management reflects these requirements as evidenced by the inclusion of a CMM & MG course (among other courses) in the curriculum.

In order to enhance the quality of teaching and learning process the experiential, non-traditional and sometimes "innovative" strategies are utilized – drawing upon Rohnke's model (also known as Tuson's model) of comfort – stretch/learning – panic zones. Traditional/ classical (teacher-centred and passive-receptive) teaching methods keep students in comfort zone for which is typical that a person work only on the basis of previous experience and knowledge, use skills and solve tasks that has mastered, has no need or motivation to change anything. But is not enough for the development of creativity and critical thinking. Our personal experience (on CMM&MG course as well as other courses) shows that the use of "non-traditional" creative teaching methods and approaches is very effective in getting students out from comfort zone into the stretch (learning) zone which is very stimulating. Typical for the stretch (learning) zone is that students do and try "new" things, gain new experience, they are motivated. We would like to add that in addition to these "benefits" there is usually a very good atmosphere and fun on seminars and lectures.

**Methodology**

The "Creative methods in management and managerial games" (CMM&MG) course is a part of Faculty of Management, University of Prešov in Prešov curriculum since the academic year 2009/2010. Its inclusion in the curriculum was a response to the need for development of curricula and exercises that enhance students' creative thinking and problem solving and fosters students' active participation in the learning process.

Students on this course are acquainted with selected creative methods and technique (applicable/used in management) - apply acquired knowledge through computer simulation supported by ICT and practice individual creative techniques and methods such as:

- the techniques aimed at generating ideas and solving problems (brainstorming, brainwriting, reverse brainstorming, case study or "lotus blossom" technique);
- self-discovery methods e.g. self-image and "animal family" (self-reflection methods adapted from psychology);
- methods of team development (teambuilding exercises, "team-ship" drawing);
- role-playing games;
- visualization of possible problems causes through the Fishbone diagram;
- games/activities for the creativity development and testing (the dot puzzle, indirect associations, alternative use, etc.).

An important part of the educational process evaluation (on the CMM & MG course as well as on other courses) is feedback evaluation. The feedback is obtained through a survey conducted at the end of the semester - after the students gained experience with various techniques, methods and simulation. The cognition of students' opinions is particularly important because it allows us (teachers/lecturers) to focus on teaching techniques that students perceive very positively and thus continuously enhance educational process.
Factor analysis was used for reduction of large set of variables and finding underlying unobservable variables that are reflected in the observed variables.

**Research design and sample**

The primary data were collected through survey in the form of self-administered questionnaires. Research sample consists of students of Faculty of Management enrolled in a two-year full-time study master's degree program who attend a course CMM&MG. The entire group of full-time students who attend the course were surveyed and therefore a total population study was used. Total number of respondents (students) participated in the survey is 67. The questionnaire contained 21 items that were scaled on five-point Likert scale (1 - strongly agree, 2 - agree, 3 – neutral (neither agree nor disagree), 4 - disagree, 5 - strongly disagree) on which respondents expressed agreement with the statements/sentences. Item 5 was considered separately (it examines the popularity of the various methods and techniques applied on CMM&MG course among students) and it was not included in the factor analysis.

**Findings**

Kaiser-Meyer-Olkin and Bartlett's Test were used to measure the appropriateness of Factor Analysis. A KMO value of 0.6 is a suggested minimum. In our case the KMO has a value of 0.68 which indicate the use factor analysis is justified. Bartlett's test of sphericity tests whether the correlation matrix is an identify matrix. Since the Sig. value is less than $\alpha$ level (0.05) the population matrix is an identity matrix and correlations in the data set that are appropriate for factor analysis.

Table 1 Kaiser-Meyer-Olkin and Bartlett's Test

| KMO and Bartlett's Test | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | ,687 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 519,627 |
| | df | 190 |
| | Sig. | ,000 |

Source: program STATISTICA 12 CZ processing

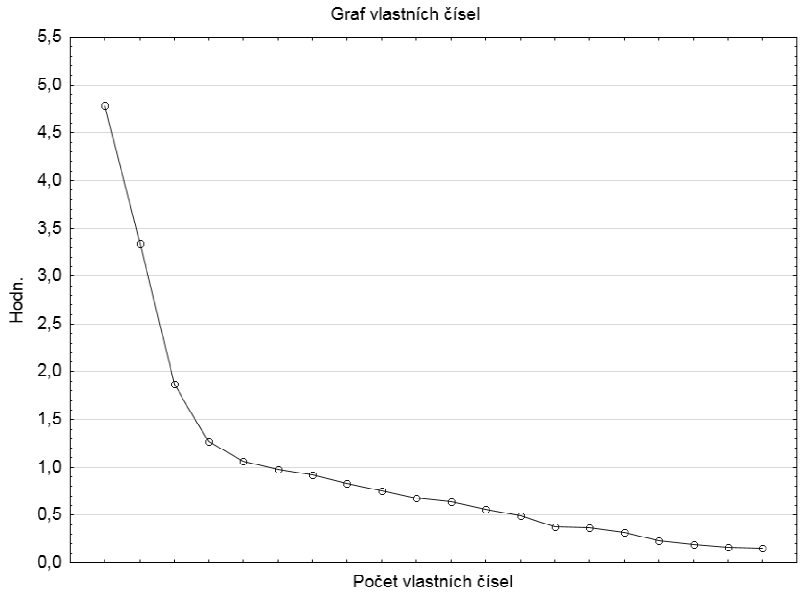
Table 2 Eigenvalue extraction

| Value | Eigenvalue Extraction: Main components | | | |
|---|---|---|---|---|
| | **Eigenvalue** | **% of Total Variance** | **Cumulat Eigenvalue** | **Cumulat %** |
| **1** | 4,782845 | 23,91423 | 4,78285 | 23,91423 |
| **2** | 3,343079 | 16,71539 | 8,12592 | 40,62962 |
| **3** | 1,873297 | 9,36649 | 9,99922 | 49,99610 |
| **4** | 1,268266 | 6,34133 | 11,26749 | 56,33743 |
| **5** | 1,065831 | 5,32915 | 12,33332 | 61,66659 |

Source: program STATISTICA 12 CZ processing

Factors with eigenvalues equal or higher than 1 retain. Five factors were extracted using the Varimax Rotation method. These extracted factors can be used to illustrate the variability of responses. The cumulative percentage of variance has a value of 53.945 which means that all five factors together account for (explain) 53.945% of the total variance.

Figure 1 Factors display through Screen plot




Source: program STATISTICA 12 CZ processing

Screen plot displays the eigenvalues associated with a factor in descending order versus the number of the component or factor. The screen plot of our factor analysis that was conducted on 20 different variables (items) shows that 5 of those factors explain most of the variability.

Table 3 Main Components extraction

| Variable | Factor load (Varimax normaliz. ) Extraction: Main Components | | | | |
|---|---|---|---|---|---|
| | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
| **v1** | **0,668469** | 0,267398 | -0,112985 | -0,097855 | 0,070021 |
| **v2** | **0,635628** | 0,339719 | 0,252746 | 0,028303 | 0,204434 |
| **v3** | **0,647818** | 0,280801 | -0,072029 | 0,318286 | 0,211059 |
| **v4** | 0,431751 | 0,220575 | -0,427359 | 0,323030 | -0,119633 |
| **v6** | **0,718602** | -0,040804 | 0,003470 | -0,038114 | 0,170236 |
| **v7** | **0,761082** | -0,073645 | -0,157963 | 0,249791 | -0,027757 |
| **v8** | **0,695329** | -0,034905 | 0,108198 | -0,054023 | 0,293634 |
| **v9** | **0,691214** | 0,038525 | 0,062535 | 0,158473 | -0,119070 |
| **v10** | 0,487385 | -0,400521 | 0,059116 | -0,283830 | 0,293916 |
| **v11** | -0,193322 | -0,027169 | **-0,819988** | -0,095135 | -0,001819 |
| **v12** | 0,154172 | -0,147602 | **-0,684520** | -0,439523 | 0,091496 |
| **v13** | 0,596895 | -0,285260 | 0,244924 | -0,181369 | -0,233675 |
| **v14** | -0,506039 | 0,493517 | 0,207926 | -0,015834 | 0,056796 |
| **v15** | 0,057190 | **0,750767** | -0,220741 | 0,226919 | 0,211636 |
| **v16** | 0,102456 | 0,380607 | 0,160469 | 0,540704 | 0,252158 |
| **v17** | -0,010611 | **0,772830** | 0,152794 | -0,086696 | -0,030665 |
| **v18** | 0,184398 | **0,829030** | 0,019627 | 0,001437 | -0,060865 |
| **v19** | 0,002236 | 0,397137 | 0,371867 | 0,241535 | 0,406855 |
| **v20** | 0,169446 | 0,014186 | -0,057085 | 0,120812 | **0,808526** |
| **v21** | 0,066049 | -0,123058 | 0,175279 | **0,793685** | 0,086106 |

Source: program STATISTICA 12 CZ processing

Table 3 shows the results of factor analysis in academic year 2014/2015. Within the extracted factors our attention will be focused on the first two factors which are related to the perception of teaching methods and techniques applied during study as well as on the CMM&MG course.

Factor 1 may be called "*Attractiveness of methods applied on the CMM&MG course and during the study*". Factor 1 significantly correlates with seven variables:

- Variable 1 (v1) represents the questionnaire item (statement): "Management (creative) methods and techniques applied on the CMM&MG course was something new for me."
- Variable 2 (v2) represents the questionnaire item (statement): "Management (creative) methods and techniques applied on the CMM&MG course were interesting to me."

- Variable 3 (v3) represents the questionnaire item (statement): "Management (creative) methods and techniques applied on the CMM&MG course were motivating for me."
- Variable 6 (v6) represents the questionnaire item (statement): "Education of managers at this faculty is satisfactory".
- Variable 7 (v7) represents the questionnaire item (statement): "Education of managers at this faculty meets my expectations".
- Variable 8 (v8) represents the questionnaire item (statement): "Teaching and learning methods with which I encounter during my study at the faculty suits me".
- Variable 9 (v9) represents the questionnaire item (statement): "Teaching and learning methods with which I encounter during my study at the faculty motivate and empower me to continuously improve myself.

Three variables are associated to the factor 2, namely:

- Variable 15 (v15) represents the questionnaire item (statement): "Innovative approaches and methods (e.g. case studies, simulations, structured games, staging games, etc.) should be more widely applied in education of managers (at the faculty)".
- Variable 17 (v17) represents the questionnaire item (statement): "I would welcome more interactivity and interactive methods on the seminars and lectures".
- Variable 18 (v18) represents the questionnaire item (statement): "I would welcome more creativity and creative methods".

Factor 2 can be called *"The demand for creative and innovative methods in education"*.

The questionnaire survey among students attending the course in academic year 2014/2015 similarly to the conclusions of the same survey conducted in the previous five academic years show that students consider methods and techniques applied on the CMM&MG course motivating and interesting and education of managers at the Faculty of Management appropriate and satisfactory. It also confirms the students' demand for creative and innovative methods in education.

**Conclusion**

The results highlight the justification and appropriateness of inclusion of the CMM&MG course in the curriculum given its focus on development of students' creativity. Unlike the majority of courses with predominant "traditional" and "passive" learning methods the CMM & MG course is seen as interesting for students and valuable in developing their creativity. The survey results also enhance our conclusions that fostering alternative teaching-learning methods as an alternative to existing mainstream courses is the "right way".

**Súhrn**
Cieľom príspevku je prezentácia názorov študentov na metódy používané vo vzdelávaní (počas štúdia) a ich vnímanie aktivít, hier a techník používaných na predmete Tvorivé metódy v riadení a manažérske hry, ktorý je súčasťou učebných osnov magisterského študijného programu na Fakulte manažmentu Prešovskej univerzity v Prešove. Pri zbere primárnych údajov bol použitý dotazníkový prieskum medzi študentmi, ktorí absolvovali daný predmet v akademickom roku 2014/2015. Prostredníctvom faktorovej analýzy boli pozorované premenné zredukované na päť faktorov. V kontexte týchto redukovaných faktorov bola naša pozornosť zameraná na dva extrahované faktory: „Atraktivita metód (výučby) používaných na predmete Tvorivé metódy v riadení a manažérske hry ako aj počas štúdia“ a „Dopyt po kreatívnych a inovatívnych metódach vo vzdelávaní“. Výsledky prieskumu ukázali, že predmet Tvorivé metódy v riadení a manažérske hry, na ktorom sa uplatňujú aktivizujúce (najmä kreativitu a kritické myslenie rozvíjajúce) formy učenia, je študentmi pozitívne vnímaný a považovaný za zaujímavý.

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**Ján Dobrovič**

# ANALYSIS FOR SLOVAKIA'S ECONOMIC PERFORMANCE IN SLOVAKIA'S TAX REVENUE ADMINISTRATION

# ANALÝZA EKONOMICKEJ VÝKONNOSTI SLOVENSKA VO FINANČNEJ SPRÁVE SLOVENSKA

***Abstract:*** *Within the frame of the research on this matter, we came out form the existing functional organizational structures and tax administration systems not only in Slovakia but also in Hungary, Poland, Czech Republic and Slovenia, whereas the fundamental prerequisite of investigation was increasing efficiency of the system globally. On the basis of trend analysis we assume that upcoming reform of Tax and Customs administration will significantly contribute to the increasing efficiency of the system and in the end to the positive perception of taxes as a socially unpopular obligations.*
***Key words:*** *taxes, tax reform, tax administration, efficiency, process management*

***Kľúčové slová:*** *dane, daňová reforma, daňová správa, efektívnosť, procesné riadenie*

**JEL**: G24

## Introduction

The examination of Slovakia's tax revenue administration should be perceived in a wider context. In order to it, it is necessary to start from the existing functional organisational structures and tax revenue administration systems in Slovakia, but also in the neighbouring countries, e.g. Hungary, Poland, the Czech Republic and Slovenia, while we think there is an objective need to change the organisational structure and to do its process-orientated optimisation, as well as to introduce marketing principles in the area of orientation on the customer in order to achieve a positive image of the tax revenue administration in the eyes of the public (Zubaľová, A. 2003).

We assume that the reform of the tax revenue and customs administration currently being prepared will significantly contribute to an increase in the effectiveness of the system and, eventually, also to the positive perception of taxes as socially unpopular obligations. (Dobrovič,J, 2011).

## 1. Development of the organisational structures of tax systems

### Structuring by type of tax

The basic criterion for the start of the oldest type of organisational structure of tax revenue administration was the structuring of executive bodies by individual existing types of tax. That type determined the creation of separate multifunctional departments for each type of tax, while such units functioned separately and

mutually independently. The organisational structure divided in such a way fulfilled its purpose, but, despite that, it had its own functional shortcomings. It created space for the duplicity of functions, which caused ineffectiveness.
If a taxpayer was subject of multiple types of taxes, the so adjusted system became complicated for him, with excessive amount of bureaucracy on the one hand and, on the other had, it was too complicated to manage the performance by taxpayers, separate control and debt collection. The ineffectiveness of the structure made around the type of tax is also underlined by the fact that there is an increased probability of unequal treatment of taxpayers and a decreased flexibility of the use of workers specialised in a certain type of tax. That eventually makes the planning and coordination of activities in the tax revenue administration managerially unsustainable. (Dobrovič,J, 2011).

**Structuring by functional groups**

This approach to the organisation of the tax revenue administration's work was made with the objective to improve the standardisation of work processes, to simplify the information flow and procedures concerning taxpayers, and to improve the operational effectiveness in general. Such an organisational structure places workers into functional groups (e.g. registration, accounting, information processing, control, collection, appeals, etc.), but, in general, works along a type of tax. When compared with the structure described in the previous chapter, created around types of tax, the application of the organisational structure based on groups increased the performance of the tax revenue administration (e.g. provided individual access points for tax enquiries, simplified the system of taxpayer registration, access to tax payments and accounting, etc.), and also increased the effectiveness of the tax control and debt collection. The modern theories of management, however, criticise such organisation of work for the division by functions, leading to the provision of poor, insufficient services and standardisation that does not bring effectiveness to the tax revenue administration due to taxpayers' varied and differing behaviours in the fulfilment of their obligations. (Dobrovič,J, 2011).

**Structuring by individual types of taxpayers**

The latest development in some developed countries has brought a model of organising services and law enforcement based on the principle of taxpayer segmentation (e.g. big taxpayers, small/medium-size taxpayers, employers, etc.). In this case the rationalisation in organising such functions by taxpayer types is in the fact that each group of taxpayers has different characteristics and behaviour and consequently represents a different level of risk in relation to the tax revenues. In order to manage those risks effectively, the tax revenue administration needs to develop and implement strategies (e.g. interpretation of the law, education of taxpayers, improving of the quality of services, focused tax inspections) that are suitable for the unique characteristics and ways of the fulfilment of tax obligations in the cases of individual types of taxpayers. From the management perspective, such a type of organisational structure creates space for the delegation of tasks and a vertical expansion of management, copying the needs of taxpayers, through the

centralisation of key functional activities within a single management structure, which, consequently, improves the level of performance. Despite a multitude of advantages and its modern management approach, the application of such an organisational structure is, for the present, in its initial phase. In some countries, departments and divisions for big taxpayers are being introduced into the tax revenue administration system. (Dobrovič,J, 2011).

## 2. Trends in the management of the tax revenue administration in Slovakia and in neighbouring countries

Each of the monitored V4 countries and Slovenia declare the orientation of their tax revenue administrations that corresponds with the decisive parameters of the effective tax revenue administration of the European Union countries. The upcoming trends in the management of the tax revenue administration (TRA), in relation with the mentioned facts concerning the TRA management in the individual V4 countries and Slovenia, irrespective of the advancement of their economies, can be summarised into the following several points(Kubátová, K.2003):

a) Effort to increase the voluntary fulfilment of tax and health and social welfare insurance obligations, professionalism, partnership and correctness in the relations with the tax revenue administration clients;

b) Continual activities supporting the decreasing of tax arrears and tax evasion;

c) Building an organisation communicating with its employees and clients professionally, openly, intelligibly and timely;

d) Effort to use human resources more effectively, to be an employer offering a job perspective and the growth of the employees' professional level;

e) The utilisation of the information technology in the TRA with the objective to get closer to the taxpayer and to speed up the tax offices' work processes in the area of administration;

f) To constantly look for new opportunities for the improvement, increasing of the quality and making services more effective without major modifications of the legislation;

g) Education and training of workers in order to create a more versatile work potential;

h) Effort to implement an effective system for the measurement of the quantity and quality of work at all levels of the tax revenue administration, set for each critical factor of success and representing a measurable value.

As a starting point of the upcoming trends in Slovakia' tax revenue administration we take the Government's Programme Declaration (http://www-8.vlada.gov.sk/index.php?ID=918 – Programme Declaration of the Government 2002) of 4.11.2002, which, in the part "Economic Policy", sets out the following objectives in the tax revenue administration: simplify the tax legislation, update the

parts of the tax laws that allow ambiguous interpretation, simplify the sanction system in the area of tax revenue, decrease direct taxes, shift the tax burden from direct taxes to indirect taxes, reassess the application of property tax rates, unify income tax rates, analyse the possibility to introduce a flat tax, strengthen the tax revenues of municipalities, specify own tax revenues of higher territorial units, secure strict, direct, fair and effective collection of taxes, decrease tax rates, restrict tax evasion, and create a new system of horizontal financial balancing.

„Slovakia is the eighth most attractive European country from the perspective of tax systems. In the KPMG International's ranking, compiled on the basis of a survey of European company representatives' views on the attractiveness of domestic tax regimes, Cyprus was placed at the top, followed by Switzerland. Both countries obtained high ranking thanks to a unified interpretation of the tax legislation, minimum changes in tax laws and relatively low tax rates." (http://ekonomika.sme.sk/c/3685557/Slovensko-ma-osmy-najpritazlivejsi-danovy-system-v-Europe.html

The survey was carried out by KPMG International (http://www.kpmg.com/SiteCollectionDocuments/2007CorporateandIndirectTaxRateSurvey.pdf) and its results reflect the views of more than 400 tax specialists in multinational companies in Europe. The evaluation criteria included the attractiveness, administrative demands, consistency, long-term stability, extent of legislation, tax rates and relations with tax offices. At the European level, according to the survey results, the least attractive area is the extent of the tax legislation. The order of the countries is specified on the basis of "absolute attractiveness", which was calculated as a difference between the percentage of the respondents according to whom the key aspects of their domestic taxation systems were attractive, and the percentage of not satisfied respondents.

Slovakia, and not just by the last tax revenue administration reform of 2007 or by the introduction of a flat tax rate, joined the progressive countries of the European Union and significantly boosted its attractiveness and competitiveness.

From the perspective of tax management levels within Slovakia, the current state can be defined as an officially two-level management, but by the transfer of some competences of the Slovak Tax Revenue Directorate (DR SR) to its detached offices (DO), it is, in fact, a three-level management, whose justification is based on the need to manage 102 tax offices, which is not possible to do from a single centre. Such organisation of the tax revenue administration is not optimal due to the following reasons:

- The performance of the main processes is fragmented by the territorial principle, while each tax office (TO) (small, medium as well as large) runs all processes related with the administration and control of taxes and tax execution, so it is not possible to achieve the optimisation of the performance of such processes or of costs of their performance from the perspective of the tax revenue administration as a whole; ( Rašner, J., Rajnoha, R.)

- The system of the deployment of tax offices is little flexible, as it does not allow to adapt the deployment of the basic organisational units to the needs of taxpayers;
- In the current system of management, DOs represent an administrative level of management, while there has been a long-term need in their work to concentrate the performance of some processes (e.g. accounting, payroll) that are unnecessarily split between the tax revenue directorate (DR SR) and the DOs and increase the administrative and communication demands;
- In the work of DOs' employees, there are problems that are characteristic for organisations that, along the line management, also apply other types of management (e.g. project, specialised-methodological, etc.). It is, for example, the case of the assignment of tasks by specialised managers of DR SR, which can collide in timing with tasks assigned by line DOs' managers. On the basis of the above-mentioned, the concept of the reform being prepared takes into consideration the principle of justice, neutrality, simplicity, unambiguousness, efficiency and the exclusion of double taxation. The Financial Policy Institute's analyses dated to 2001 – 2004 show the reasons for the clear need of a reform (Dobrovič J. 2015):
- Complexity of the tax law – lack of clarity;
- A lot of exemptions, liberations and reliefs, leading to social ineffectiveness, when the production and consumption is not influenced by the supply and demand, but also by tax advantages;
- Variability of the specification of the tax base, which allows the optimisation by the taxpayer, which increases administrative costs and decreases the possibility to control.

From the perspective of the management and organisation of the tax revenue administration, as further reasons we can consider:

- Complexity of the organisational structure – duplicity of functions and powers at the central and regional levels;
- A costly administrative tax revenue administration apparatus;
- Non-transparent project management, decreased possibility to control processes;
- The taxpayers' unwillingness to pay taxes;

The Slovak government's intention, declared in the mentioned Slovak Government's Programme Declaration, is to carry out the reform of the tax revenue administration in a way that makes it more effective, with the objective to methodologically help the taxpayers with a good taxpaying discipline and to uncover taxpayers that avoid the payment of taxes. The objective is to create conditions for an effective co-ordination of public administration bodies, to guarantee the access by citizens via the Internet, and to secure the interconnection of information systems of public administration bodies. The reform of the customs administration, with the vision of

uniting the tax, duty and health and social welfare insurance premium collection processes, is also a priority task of the Slovak Ministry of Finance. The reform should take place in two phases: the first one will unite the tax revenue and customs administrations; in the second one, the tax, duty and health and social welfare insurance premium collection will be united (Dobrovič J. 2015).

The first phase has the name UNITAS I and part of it is a reform of the tax revenue and customs administration. For that phase it is proposed to examine the possibilities of process synergies in the tax revenue and customs administrations, to adopt legislative changes resulting from both audits and to subsequently coordinate the implementation of changes in both institutions. That determines the subsequent decision whether the optimization process will result in the uniting of the tax revenue and customs administrations or whether they will keep existing separately. It is proposed to develop a feasibility study, which would comprehensively assess the essential preconditions, possible benefits, and risks of uniting the tax, duty and health and social welfare insurance premium collection.

The second phase of the reform being prepared, also called UNITAS II, and its launch, will be influenced by the successful realisation of the benefits of the UNITAS I phase. In the UNITAS II phase, after the development of process models in the institutions concerned, a process model of the united collection should be developed, with a subsequent change in the legislation and the adaptation of the information technology (IT) support of the affected organisations(Dobrovič J. 2015): The optimisation of the processes in line with the above-mentioned intentions focuses in particular on:

- Centralisation of the tax revenue and customs methodology at the Financial Directorate (FR SR);
- Centralisation of services for the public at the FR SR;
- Centralisation of the payment contact and of the accounting of taxes, fees and duties at the FR SR;
- Concentration of the execution process at Financial Offices (FOs);
- Concentration of the control process at the FOs;
- Concentration of taxes;
- Splitting of tax administrators' tasks by the character of activities and the uniting of tax administrators' registration and administrative activities;
- Centralisation of support processes at the FR SR;
- Unification and simplifying of forms for obliged taxpayers;
- Introduction of a unified identifier for natural persons and legal entities;
- Development of electronic services and elimination of paper-based communication;
- Development of electronic communication with other public administration

bodies and with other bodies and institutions;

- Reduction of bureaucracy through the introduction of e-government, electronic communication and digitising of files;
- Reduction of the taxpayer's loading by the removal of the duplicity of the provision of information to public administration bodies.

Through that process, Slovakia is getting closer to an effective taxation system, which will mean an increased effectiveness and competitiveness of our country within EU countries. The impacts of the proposed changes can be split into two basic categories. The first one includes the benefits of the reform of the tax revenue and customs administration that have in particular the character of cost and time savings, of increased added value and work efficiency, etc. The second category is represented by the expenditures made to achieve the individual objectives on the reform of the tax revenue and customs administration. Both of the mentioned categories are further split into the impacts on the taxpayer, i.e. the user, and the impacts on the public administration. The expenditures and benefits of the reform either have a one-off, time-limited, or permanent character. From the financial perspective, the impacts with a permanent or repeating effect are of the greatest significance (KÁRÁSZ, P. st., RENČKO, J., KÁRÁSZ, P. ml. 1997).

**Conclusion**

In the research of the issue, we started from the existing functional organisational structures and tax revenue administration systems not just in Slovakia, but also in Hungary, Poland, the Czech Republic and Slovenia, while the basic assumption of the examination was an increase in the effectiveness of the system as a whole, through a change in the organisational structure and its optimisation, as well as through the introduction of marketing principles in the area of orientation on the customer in order to achieve a positive image in the eyes of the public. (Dobrovič J. 2015).

The introduction of the reform in Slovakia's tax revenue administration (TRA) that is being prepared lies in the optimisation of the number of tax offices (TOs) and in the change of the organisational structure, which will bring significant savings in their budgets. In the next phase, the uniting of the tax revenue and customs administrations is being planed with the objective to subsequently unify the collection of taxes, duties and health and social welfare insurance premiums.

From the managerial perspective, the following expectations of the benefits of the reform are significant:

- Better administration of the state's receivables with the possibility of their mutual compensation and a stronger position in receiverships;
- Optimisation of the number of employees by the elimination of the performance of duplicate activities and by the reduction of management positions;
- Decreased costs of the running of a united organisation (Dobrovič J. 2015).

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# ANALYSIS OF LOCAL SELF-GOVERNMENT REPRESENTATIVE' PERFORMANCE – CASE STUDY

# ANALÝZA VÝKONNOSTI PREDSTAVITEĽA MIESTNEJ SAMOSPRÁVY – PRÍPADOVÁ ŠTÚDIA

***Abstract:*** *In today's turbulent times, public institutions are trying to achieve the highest efficiency when providing public goods. The paper deals with performance evaluation of local self-government elected representatives by using time studies and other innovative approaches. Improving of employees' performance has a positive effect in the performance of the entire organization. The result of a successful management performance is confirmation of its linkage to elementary practices in human resources management.*
***Key words:*** *performance, methods, local self-government, performance management*

***Kľúčové slová:*** *výkonnosť, metódy, miestna samospráva, manažment výkonnosti*

**JEL:** H49

## Introduction

The necessity of managerial techniques introducing in the management of public administration is connected with its permanent reforms and the modernization. The primarily objective is increase of effectiveness, efficiency and debureaucratisation of public administration. Local government sector is focused on the quality of provided public goods at the local level [9, 2012, 22], [10, 2014, 311]. This, in the context of the amount of responsibilities and the current state of public finances in time of ongoing financial crisis, puts pressure on the activities of local authorities. In the eyes of the citizens, the most significant representative of the municipality is mayor. Mayor, as a person, is often associated with only representative function, although his activities consist of a large number of daily management decisions pursued for the benefit of citizens of municipality.

The traditional way of tracking the performance of companies in the private sector is based on an assessment of their ability to achieve desired financial indicators - profits, turnover or market share. The company is ranked as powerful when it reaches the planned financial results. In the sector of self-government, it is not possible to evaluate the performance of the institution in this way, since the results of its action are not financial indicators. Despite sophisticated management approach (controlling system), which is trying to eliminate this weakness of traditional performance evaluation, this flaw is not eliminated and decision on management of performance is realized as an ad hoc decision, as a response to the identified real state that has already happened. Nowadays, there are new approaches to monitoring the performance of companies, which are based on the traditional system with combination of other aspects. Modern methods of performance evaluation are based

on the assumption that the company is efficient if it is able to achieve pre-defined strategic objectives. There are two basic approaches used in practice. The first is based on defining and assessing strategic objectives for four basic areas (financial, client, internal processes of learning and growth) called Balanced Scorecard (BSC), which is the system of balanced indicators. The second approach is based on the measurement of organizational performance by using performance measurement process, called Performance Management. The common denominator of both approaches is their deviation from assessment of business performance solely based on financial indicators and widespread use of other types of indicators (qualitative and time) [3, 2003]. The article discusses the time study focussing on the elected representative of the municipality and the results are compared with the data published in different sources. The results indicate that it is totally individual working time span that corresponds to the work of the elected representative in a small municipality.

**Material and Methods**

Performance measurement of processes is required in ISO 9001 norm, but a set of standards ISO 9000 does not define term performance. Performance is accurately defined by Excellence Model EFQM as "measure of results achieved by individuals, groups, organizations and processes" [15, 2004, 98].

For this study, we have used the time frames applied to the work of mayor in a small village (328 inhabitants) in summer of 2014. Each person produces with his work certain outputs (physical, informational). Depending on whether they have specific internal customer while directly affecting the achievement of business objectives, outputs are divided into useful and useless. A useless output produces man when nobody needs them and they are not necessary for the fulfillment of business objectives. Ideal state of human performance occurs when man produces only useful outputs, but this is difficult to achieve in practice. From this postulate, we started with implementation of time frames. Time studies belong to the oldest methods of rationalization of production. From the point of scale and complexity provided information applied in technical practice, here belong time studies: [8, 2000, 54].

a) continuous observation:
- frames of working day (individual or group of employees) – also applicable in public administration,
- frames of operation

b) interrupted observation:
- moment observation,
- bilateral observation.

Frames of working time are characterized by constant observation (measuring and recording) actual time consumption during the workday from beginning to end. Using this method it is possible to detect not only time consumption of employees, but also the structure of time spent [16, 2010], [11, 2012, 42]. The purpose is to

determine the type and amount of time consumption, identify time losses, reveal their causes and make proposals for maximizing the usage of time during working day. Results determined on the basis of that frame are used for improving the organization of production, improving the material, technical and organizational ensurance of production and are basis for normative of working day time. Frames of the working day are stated in four stages, representing also stages of author`s work: [4, 1993, 63]

- preparation for observation,
- observation and measurement,
- rocessing an analysis of measured values,
- developing of measures proposal.

**Results and Discussion**

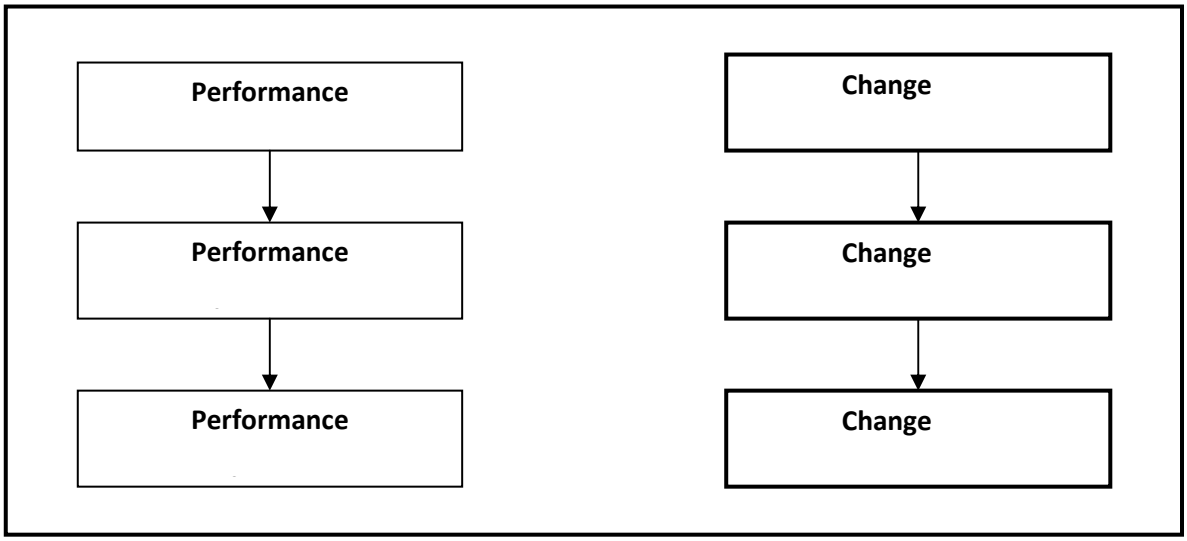
The performance of government can be today interpreted from the perspective of the ISO processes. Although these standards use it, they don't define it [12, 2013, ]; from the perspective of the European Foundation for Quality Management (EFQM), which defines performance as measure of results achieved by individuals, groups, organizations and processes [7, 1991]; but also by the Center of Municipal Development (CRS) and the Association of Cities and Municipalities (ZMOS) under the benchmarking process [5, 2013]. At the local level, it belongs between the relevant factors and motivators of performance enhancement the application of modern methods in management and marketing, application of the latest trends in providing of services, the ability of fast implementation of innovation, better organization of work, improving work with human resources, increasing of human capital value, their effective motivation to performance and working with the perspective and talented staff [2, 2010, 5]. Demotivated staff is less creative and their performance gradually decreases [6, 2009, 56].

An individual in company is effective, if his work contributes to the achievement of its objectives. This definition is general and in real assessment of actual performance of the man completely useless. To track the performance of workers in managerial practice, it has been implemented a number of ways, the most important are standardization of work (useful but only to a selected number of jobs) and staff assessment. Staff assessment is a proven way to measure the performance of people. Widely used method for evaluation of individual performance assessment is based on the ability to meet pre-determined tasks in the required time and with the required quality. This method of evaluation can be in local government, as well as in public administration, used also problematically.

Any organization can be understood as organized system of processes, activities and operations that are performed to ensure mission of the organization, doesn't matter if profit and non-profit organization or public or private organization. Application of management methods was until recently almost exclusively the domain of private enterprises and business organizations. Increased government accountability for development at the local and regional level, competition of regions, settlements but also across whole country is also reflected to search for new management methods of municipality.

Even in local government applies, that performance management corresponds to the level of management of changes. This also applies to change of people, performance and organization. Change of performance in today's organizations is very difficult done only by reducing costs, harder work, dismissal of people... This process must be controlled and goals must be set realistically. The most optimal appears to be increasing of organization over the people within individual practices in human resources management.
The relationship between increasing the efficiency and performance of the organization is shown in Figure 1. From the figure it is clear, that personal changes precede changes in the organization, so first you need to improve the performance of the individual and only then there is a change in organizational performance.
Efficient organization has defined objectives and performance indicators which are regularly measured and evaluated. In local government it is quite impossible to determine measurable indicators for mayor. It is known, that the key performance indicators should correspond to the nature and size of the organization and its products, processes and activities [14, 2013]. It is necessary, that these are consistent with the goals of the organization, which should be consistent with its strategy and policy of achieving performance efficiency and should provide information useful in improving of operations and processes efficiency.

Figure 1: Relationship of change and performance




Source: [13, 2013, 1]

In Table 1 we can see an overview of categories and activities of managers as it is stated by [19, 2004, 30]. Based on table, manager divides his working time into the activities respectively categories. First activity is planning. In this category there are planning of work and time, planning of conceptual materials and development of projects, including financial budgets. Another category is education, which is an important factor of managerial activities, as the study of the books, articles, materials and monitoring print and web pages is the basis for acquiring new information and new opportunities. Parts of managerial activities are also meetings, interviews, negotiations, telephoning and e-mailing, and composing letters which

ensure organizational activities and represent another category of managers operations. Among other categories, authors include control activities, trips and meetings and as well the rest, which is part of the work. Any effective functioning of the organization is dependent on the organizational skills of managers in the organization. We can paraphrase a well-known quote, that only one, who can control himself, can manage the others.

Table 1 Categories and activities of managers

| | |
|---|---|
| **Planning of activities – 25 % of time** | Planning of work and time |
| | Planning of conceptual materials |
| | Development of projects, including financial budgets |
| **Education – 25 % of time** | Study of specialist books, articles, materials, press monitoring and web pages |
| **Organization of activities – 20 % of time** | Meetings |
| | Conversations and negotiations |
| | Calling and emailing |
| | Composing of letters |
| **Control activities – 15 % of time** | Assessment of developed specialist materials |
| | Inspection of workplaces |
| | Work with mail |
| **Trips and meetings – 10 % of time** | Business trips, meetings |
| **Resting – 5 % of time** | Resting - relax as part of work |

Source: [19, 2004, 53]

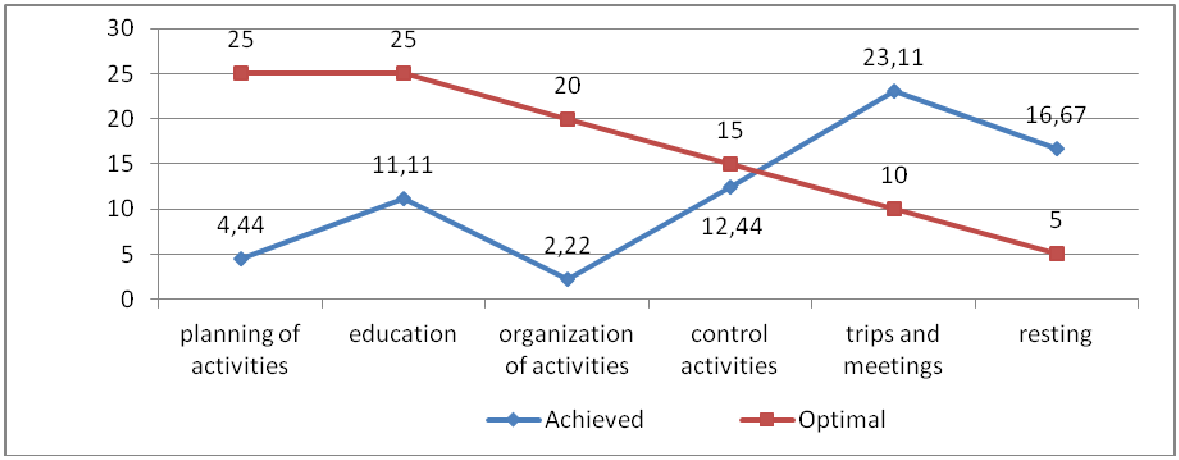
Mayor of municipality performs monitoring of working week into recording sheet himself, where he recorded activities and time span for every day in whole week. Detailed overview of duration of each mayor activity is shown in Table 2 and Figure 2, where we can see and compare actual time spent on various activities during the week. By performing role of the mayor, there are implemented various management functions during the whole week, while observing the duration of each activity, we identified how much time in the percentage of the Month took in terms of Mayors´ managerial work.

Table 2 The percentages of each activity during one working week

| Activities of mayor | Duration in minutes | Actual percentage share (%) | Optimal percentage share (%) |
|---|---|---|---|
| **planning of activities** | 100 | 4,44 | 25,00 |
| **education** | 250 | 11,11 | 25,00 |
| **organization of activities** | 725 | 32,22 | 20,00 |
| **control activities** | 280 | 12,44 | 15,00 |
| **trips and meetings** | 520 | 23,11 | 10,00 |
| **resting** | 375 | 16,67 | 5,00 |
| **Sum** | **2 250** | **100,00** | **100,00** |

Source: Results of own measurements

Figure 1 Optimal and achieved percentage shares of activities during the working week




Source: Results of own measurements

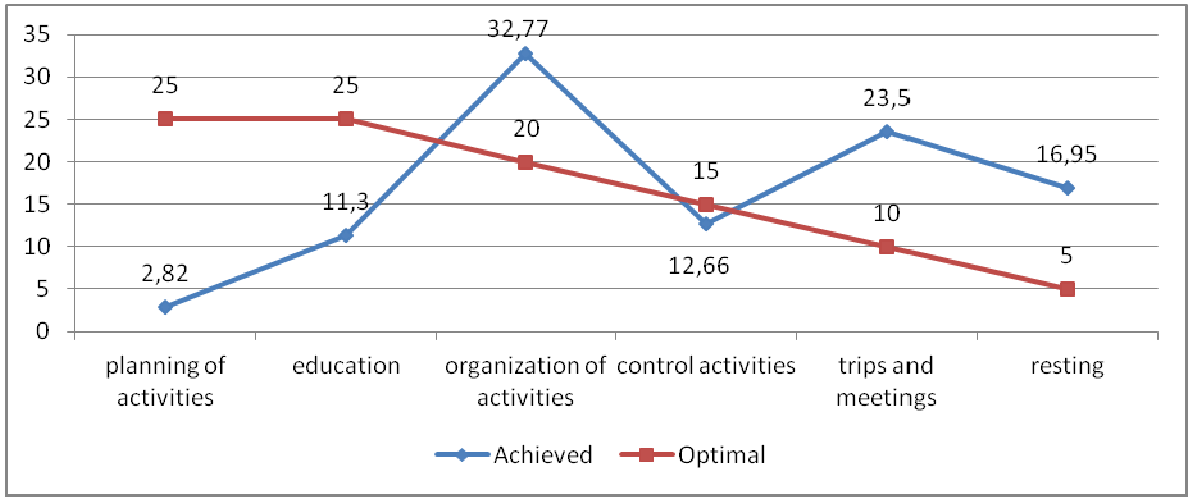
To increase the objectivity of the survey data, we conducted measurements for 4 weeks of one month (in the same way). Monthly results are shown in a Table 3 and Figure 3.

Table 3 The percentages of each activity during one working month

| Activities of mayor | Duration in minutes | Actual percentage share (%) | Optimal percentage share (%) |
|---|---|---|---|
| **planning of activities** | 250 | 2,82 | 25,00 |
| **education** | 1 000 | 11,30 | 25,00 |
| **organization of activities** | 2 900 | 32,77 | 20,00 |
| **control activities** | 1 120 | 12,66 | 15,00 |
| **trips and meetings** | 2 080 | 23,50 | 10,00 |
| **resting** | 1 500 | 16,95 | 5,00 |
| **Sum** | **8 850** | **100,00** | **100,00** |

Source: Results of own measurements

Figure 2 Optimal and achieved percentage shares of activities during the working month




Source: Results of own measurements

The basis for analysis of working week and working month was recording each activity of mayor. By analyzing, activities were categorized, especially in terms of their repeatability. Weekly activities, such as individual evaluation of assigned tasks and their control, are activities, which are repeating every working day. Also activities like monitoring e-mails, telephoning, dealing with correspondence and communication with the citizens of the village. Only once a week, we identified two activities carried out by the mayor, as activities for schedule preparation for the whole week and planning necessary negotiations during the next week. In terms of monthly time study of the working day, mayor devoted most of time to the organization and negotiations outside the village. As for daily and weekly timetable, we can see that once again, it is the largest activity of organization and large time span is dedicated to the business trips and meetings.

According to word of mayor, by performing his functions, he devotes lot of time to the organization of activities. Most of time, he devotes to communication with the inhabitants of the municipality. He is also spending enough time with his workers and individual discussions with them. Our findings were slightly different. Similar conclusions were reached also in other researches, Tej and Kočkin (2013), although they have categorized mayor's activities in time studies differently. Just as they, we have to state quite large variance in diversity of mayor's activities.

## Conclusion

Mayor has every day only limited amount of energy, which he must spend by the most productive way. It is also possible, that he wastes energy and time on unimportant tasks and therefore he fails to make progress on important projects that require high concentration and great effort. For this reason, it is necessary for mayor to know himself, his habits, system of work, performance curve while he realizes his bad habits and reveals thieves of time. But knowledge itself is not enough, it is necessary to adopt measures, which will help him to use time more effective and perform work but also personal goals. Probability of success in any action depends on certain factors. The first factor gives more emphasis to interest, enthusiasm, zeal,

anger, threats and punishment. The second factor represents habits and the amount of spent will. Choosing the right place, time and person is defined by a third factor. Obtaining, preparation and tools are included in the latest factor. These factors are important and their absence means zero concentration.
The work of mayor, as elected representatives, is seen from the side of citizens often as the obligation connected with a representative role. With decreasing of municipality size, mayor has fewer employees, less money, but the extent of competences set by law does not change - there is only a change in frequency of acts related to the performance of individual competencies. In analysis of mayor's working time there were identified individual activities and time matrix allocated adequate value. The result of the analysis is knowledge of individual activities of manager – mayor and his time devoted to them. The results are in some sense mirror of mayor's own timetable. Every manager, regardless of the sector in which he operates, should analyze his time. The most appropriate method is time study, particularly frames of working time. Mayor himself after the recording of activities, subsequent evaluation and interviews, considered the most important:

- setting targets clearly,
- planning of activities,
- work according to priorities,
- control over targets and activities,
- to avoid perfectionism,
- rational phone calls,
- learn to say no,
- proper preparation of meetings,
- not letting somebody to interrupt during important activity,
- effective usage of time spent during long trips,
- act positively and motivation of colleagues,
- respect rest time.

Based on knowing which factors are affecting and clear categorization of individual activities, it is possible to manage very efficiently and effectively the performance of oneself and performance of organization. Using time studies has its reason, because it may help the individual actors of management processes in their time management, what will lead to some degree of rationalization of routine activities and also to achieve an increase in performance of a public authority's representative. Extending the research objective of this study could bring more light into investigated topic of time distribution of public representatives in different positions and different levels of government.

**Summary**
In today's turbulent times, public institutions are trying to achieve the highest efficiency when providing public goods. The paper deals with performance evaluation of local self-government elected representatives by using time studies and other innovative approaches. Improving of employees' performance has a positive effect in the performance of the entire organization. The result of a successful management performance is confirmation of its linkage to elementary practices in human resources management. Analysis of work using time study of mayor pointed

out certain disproportions compared to data published in the scientific literature. It is caused mainly due to the specificities of the mayor's activities based on municipal size category and kind of provided public or communal goods.

**Súhrn**

V dnešnej turbulentnej dobe sa inštitúcie verejnej správy snažia dosahovať čo najvyššiu výkonnosť pri poskytovaní verejných statkov. Príspevok sa zaoberá hodnotením výkonnosti volených predstaviteľov miestnej samosprávy za využitia časových štúdií a ďalších inovatívnych prístupov. Zvyšovanie výkonnosti zamestnancov sa pozitívne prejavuje vo výkonnosti celej organizácie. Výsledkom úspešného manažmentu výkonnosti je potvrdenie jeho naviazanosti na elementárne praktiky v riadení ľudských zdrojov. Analýza práce pomocou časovej štúdie starostu obce poukázala na určité disproporcie v porovnaní s údajmi uvádzanými v odbornej literatúre. Je to spôsobené hlavne špecifikami činnosti starostu na základe veľkostnej kategórie obce a v druhu poskytovaných verejných či komunálnych statkov.

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# ANALYSIS OF INCOME FOR CITIZENS AT NUTS III LEVEL IN SLOVAKIA AND CZECH REPUBLIC

# ANALÝZA PRÍJMOV OBYVATEĽOV NA ÚROVNI NUTS III NA SLOVENSKU A V ČESKEJ REPUBLIKE

***Abstract:*** *At present, more and more, whether in economic practice, political, business or private life globally we encounter problems that affect us all. Poverty is one of the greatest ethical challenges of the 21st century, affecting all mankind. Poverty is a very complex and complicated concept and is now considered one of the most serious challenges of a globalized world. In today's world, inequality and poverty constantly create a rift between rich and poor that is growing on a global and national scale in different European countries. The aim of this paper is to present a view of poverty with regards to the general state of socio-economic inequality and poverty indicators throughout various regions of the Slovak Republic and Czech Republic.*
***Key words:*** *poverty, region, economy, income*

***Kľúčové slová:*** *chudoba, región, ekonomika, dôchodok*

**JEL:** E6

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## Introduction

Poverty is one of the major ethical, economic or social phenomena that affect the world today and perhaps the entire human community since its birth. It poses ethical problems in the sphere of integration, quantifying at the macro level.

These phenomena have various manifestations in time and space. According to [3, p. 99] this is manifested by the fact that the issue of poverty is found also in the social encyclicals of Pope John Paul II, who in his encyclical "Laborem Exercens intends that the embodiment of social justice in different parts of the world, in different countries and their mutual relations are always in need of new movements of solidarity among workers and solidarity with workers. The poor appear in different forms in different places and in different situations. In many cases poverty occurs as a result of contempt for the dignity of human labor – and if coupled with limited employment opportunities, we also find the scourge of unemployment ". The issue of poverty is addressed by many authors, the most famous of whom is [1, 5, 7, 8].

The aim of this paper is to present a view of poverty with regards to the general state of socio-economic inequality and poverty indicators throughout various regions of

the Slovak Republic and Czech Republic. This aim has been achieved by using coparative analysis and regression analysis in choosen cases. There was handling selected regional annual indicators for the period 2005 – 2013.

**Analysis of income at NUTS III**

In the identification and comparison of cash income for citizens of the Slovak and the Czech Republics, it can be stated that net cash income from 2005 to 2012 increased by 45,85% in Slovakia and 37.30% in the Czech Republic, which represents 8,55% faster income growth in Slovakia over income in the other country. And yet, the average net cash income in the Czech Republic is still at higher than in our country. Net cash income for residents, due to the ever increasing cost of living, do not correspond to a corresponding growth rate in standard of living. Conversely, for some years even though we observed a reduction in net cash income for residents, it did not lead to a true reduction in the standard of living. Increases in unemployment during the financial economic crisis caused a fall in income of the population in 2009 and 2010 for the Slovak Republic, but for the Czech Republic, the economic crisis did not affect their net cash income.

In Tables 1 and 2, we show the overall development of revenues for each region for the period 2005 – 2013 in Slovakia and the Czech Republic. The slowest developing county in terms of revenue growth was the SR Košice region, where income during the period increased by only 38,28% (in absolute terms by almost € 94 per capita), and Czech Plzeň region with 31,95% growth ( in absolute terms it is less than € 110 per capita). An almost 100% increase in cash inflows from the beginning of the period was recorded in the Hradec Králové region (90,33%, in absolute terms € 208,14 per capita), and a 55% increase in Trenčín region in Slovakia (in absolute terms an increase of € 133,82 per capita), which they are referring to as the fastest developing region in the analyzed republics. From the data collected it shows that, as in the Slovak Republic, the highest income levels per capita can be seen around the capitals, i.e. in the region around Bratislava for Slovakia, and in the region around Prague for the Czech Republic. In the Czech Republic we noted a permanent increase in cash receipt totals for the whole country, but particularly in Central and South Bohemia, Karlovy Vary and South Moravian Region, and the Vysočina Region. The Slovak Republic has not maintained uninterrupted revenue growth, as in 2009 and 2010 when the net cash influx registered a decline of 0,5 p. b. A permanent increase in revenue was achieved in only one region in the SR, the Trenčín region, which had the highest increase in cash influx for the whole period.

Table 1 Net cash receipts by region of the SR (Eur / month)

| SR | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|
| **Combined SR** | 251.18 | 285.97 | 320.43 | 352.22 | 350.61 | 348.95 | 361.77 | 366.34 | 370 |
| **Region of Bratislava** | 326.23 | 381.3 | 407.87 | 465.57 | 441.32 | 442.79 | 452.51 | 468.54 | 487 |
| **Region of Trnava** | 253.6 | 285.97 | 335.43 | 367.58 | 359.39 | 373.21 | 376.65 | 384.57 | 388 |
| **Region of Trenčín** | 242.18 | 282.85 | 309.81 | 338.55 | 347.04 | 355.47 | 364.55 | 370.95 | 376 |
| **Region of Nitra** | 254.03 | 285.27 | 321.72 | 349.13 | 345.28 | 343.98 | 361.81 | 352.16 | 354 |
| **Region of Žilina** | 241.15 | 277.14 | 307.21 | 336.53 | 345.47 | 337.53 | 356.26 | 367.01 | 362 |
| **Region of Banská Bystrica** | 241.98 | 276.04 | 309.99 | 331.48 | 323.81 | 335.25 | 349.62 | 353.07 | 356 |
| **Region of Prešov** | 222.83 | 247.53 | 287.54 | 309.19 | 327.03 | 305.47 | 327.08 | 327.65 | 328 |
| **Region of Košice** | 243.71 | 269.57 | 304.87 | 340.95 | 331.15 | 322.07 | 330.44 | 333.77 | 337 |

Source: Own processing based on the findings of the Slovak Statistical Office

Table 2 Net cash income by region the CR (Eur / month)

| ČR | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|
| **Combined ČR** | 328.67 | 355.69 | 395.25 | 421.11 | 431.31 | 435.76 | 444.38 | 451.25 | - |
| **Region of Prague** | 417.44 | 444.93 | 475.53 | 515.96 | 582.32 | 591.56 | 584.63 | 589.98 | 586.57 |
| **Region of Middle Bohemia** | 338.3 | 344.36 | 366.77 | 414.29 | 460.96 | 464.32 | 474.66 | 478.14 | 496.65 |
| **Region of České Budějovice** | 309.94 | 322.83 | 338.51 | 374.84 | 403.1 | 401.99 | 419.52 | 426.54 | 436.48 |
| **Region of Plzeň** | 343.41 | 344.2 | 375.91 | 395.15 | 411.19 | 441.43 | 436.14 | 451.49 | 453.13 |
| **Region of Karlovy Vary** | 279.84 | 321.17 | 343.57 | 353.46 | 382.22 | 396.89 | 440.31 | 435.76 | 435.93 |
| **Region of Ústí nad Labem** | 290.41 | 311.92 | 345.64 | 367.36 | 383.93 | 387 | 376.04 | 382.95 | 385.47 |
| **Region of Liberec** | 324.6 | 329.7 | 346.24 | 365.39 | 392.27 | 404.31 | 397.59 | 433.44 | 428.35 |
| **Region of Hradec Králové** | 230.43 | 314.05 | 345.48 | 368.36 | 404.51 | 413.34 | 443.13 | 426.04 | 438.57 |
| **Region of Pardubice** | 276.32 | 294.8 | 324.63 | 356.32 | 382.01 | 394.95 | 391.6 | 403.09 | 400.3 |
| **Region of Jihlava** | 276.64 | 302.68 | 328.99 | 365.71 | 395.88 | 411.28 | 427.58 | 439.44 | 445.56 |
| **Region of Brno** | 288.14 | 304.38 | 337.1 | 357.21 | 399.99 | 415.05 | 425.63 | 438.89 | 453.26 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Region of Olomouc** | 293.16 | 292.5 | 322 | 349.94 | 367.75 | 385.55 | 384.73 | 401.86 | 416.07 |
| **Region of Zlín** | 276.97 | 306.71 | 332.25 | 358.44 | 400.39 | 393.14 | 402.72 | 422.69 | 412.86 |
| **Region of Ostrava** | 290.57 | 293.91 | 316.27 | 345.77 | 372.07 | 383.22 | 375.81 | 383.32 | 395.48 |

Source: Own processing based on the findings of the Czech Statistical Office (converted into Euro using the exchange rate of € 1 = 27.652 CZK dated 28/11/2014, rounded according to mathematical rules)

## The analysis of poverty in Slovakia and Czech Republic

When analyzing poverty, it is important to also focus on material deprivation of the population, which is referred to as a weaker form of poverty. People affected by material deprivation cannot ensure satisfactory coverage of their needs because of lack of resources. Material deprivation in Slovakia is suffered by a higher percentage of people than in the neighboring Czech Republic, but we can say that the level of material deprivation in Slovakia is declining at a faster pace. While in comparison with the Czech Republic, when the rate of deprivation during the period 2005 – 2013 decreased by only 6,8%, in Slovakia this rate declined by an incredible 19,2% And yet, in Slovakia in 2013 there was an increasing deprivation, as in the Czech Republic in 2005, by 0,7 p. b. The most materially deprived residents are aged 65 years and over in both countries. In 2013, Slovakia had an estimated 194 281 materially deprived people aged 65 and over, and the Czech Republic had more than 303 000 people in a similar state.

Table 3 Material deprivation rate by age group in the SR in %

| SR | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|
| **Combined SR** | 42.6 | 35.7 | 30.2 | 27.8 | 24.5 | 24.9 | 22 | 22.7 | 23.4 |
| **0 ─ 18 years old** | 44.7 | 36.6 | 31.8 | 29.5 | 28.3 | 28.9 | 23.7 | 23.9 | 25.5 |
| **18 ─ 64 years old** | 40.8 | 33.8 | 27.6 | 25.4 | 22.5 | 23.3 | 21.3 | 21.5 | 22.2 |
| **65 years old and over** | 49 | 44.1 | 41.7 | 37 | 30 | 28.2 | 23.5 | 27.4 | 26.5 |

Source: Own processing based on the findings of the Slovak Statistical Office

Table 4 Material deprivation rate by age groups in the Czech Republic in %

| Czech Republic | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|
| **Combined Czech Republic** | 22.7 | 19.7 | 16.4 | 16.2 | 15.6 | 15.1 | 16.1 | 16.8 | 15.9 |
| **0 ─ 18 years old** | 27 | 23.4 | 19.5 | 18.8 | 18 | 18.9 | 19.3 | 19.2 | 16.4 |
| **18 ─ 64 years old** | 20.9 | 18.7 | 15.5 | 15.2 | 14.9 | 14.2 | 15.4 | 16 | 15.5 |
| **65 years old and over** | 25.6 | 19.8 | 16.7 | 17.3 | 15.9 | 14.2 | 15.4 | 17.4 | 16.6 |

Source: Own processing based on the findings of the Czech Statistical Office and Eurostat

After focusing on the poverty risk rate, as seen in Tables 5 and 6, the most vulnerable group suffering from poverty are people who are 17 years old, which lasted until 2013 in both countries. An exception is the year 2013 in the Czech Republic, the most vulnerable groups were the population aged 18 – 24 years, by 0,1%. The most significant decline (1,4%) in the poverty rate as reported in the years 2005 to 2013 were people aged 25 – 54 years in the Slovak Republic and the Czech Republic, which also saw a 6,3% drop in the proportion of people at risk of poverty under the age of 17 years. In 2013, Slovakia suffered from more than 216 000 people aged 0 – 17 years (20,3% of that age group) living in poverty, a decrease of just under 20 000 persons compared to 2012 (21,9% of that age group). In the Czech Republic the poverty rate was by nearly half that as in Slovakia. But the number of people in Slovakia at risk of poverty up to the age of 17 in 2012 amounted to 255 600 persons and in 2013 amounted to 209 000 persons, when we registered a decline of 2,6%, which in absolute terms represents 46 600 people fewer people aged 0 – 17 years.

Table 5 Poverty risk by age group for the SR in%

| SR | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|
| **Combined SR** | 13.3 | 11.6 | 10.6 | 10.9 | 11 | 12 | 13 | 13.2 | 12.8 |
| **0 – 17 years old** | 18.9 | 17.1 | 17 | 16.7 | 16.8 | 18.8 | 21.2 | 21.9 | 20.3 |
| **18 – 24 years old** | 15.6 | 12.5 | 11.5 | 11.9 | 13.3 | 14.7 | 14.8 | 14.4 | 15.1 |
| **25 – 54 years old** | 13.5 | 11.1 | 9.6 | 9.5 | 9.6 | 11.1 | 12.4 | 12.4 | 12.1 |
| **55 – 64 years old** | 6.4 | 6.8 | 5.7 | 7.4 | 6.1 | 8.1 | 10 | 10.2 | 9.7 |
| **65 years old and over** | 7.1 | 8.5 | 9.6 | 9.9 | 10.8 | 7.7 | 6.3 | 7.8 | 6 |

Source: [9]

Table 6 Poverty risk by age groups for the ČR in%

| Czech Republic | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|
| **Combined Czech Republic** | 10.4 | 9.9 | 9.6 | 9 | 8.6 | 9 | 9.8 | 9.6 | 8.6 |
| **0 – 17 years old** | 17.6 | 16.5 | 16.6 | 13.2 | 13.3 | 14.3 | 15.2 | 13.9 | 11.3 |
| **18 – 24 years old** | 10.7 | 12 | 12.1 | 11.6 | 11 | 11.2 | 12.7 | 13.4 | 11.4 |
| **25 – 54 years old** | 10.3 | 9.3 | 8.7 | 8.3 | 7.1 | 8 | 9.1 | 9 | 8.4 |
| **55 – 64 years old** | 5.2 | 5.1 | 5.6 | 6.2 | 6.7 | 6.2 | 6.8 | 7.7 | 7.5 |
| **65 years old and over** | 5.3 | 5.9 | 5.5 | 7.4 | 7.2 | 6.8 | 6.6 | 6 | 5.8 |

Source: Own processing based on the findings of the Czech Statistical Office and Eurostat

Generally the type of households to suffer the most poverty is the single-parent family with dependent children. From 2005 – 2007, in both the Slovak and Czech Republics, this group faced the most poverty. From 2008 – 2012, this changed to the two parent family, with three or more dependent children.

Between 2005 to 2013, the Czech Republic saw poverty in single parent families with dependent children decrease from 41% to 27,8% The period, except for 2007 – 2008 when this rate of poverty rose to 40%, saw a continuous rapid decrease in the rate of poverty among those households (two adults with two dependent children). For this group the rate of vulnerable households decreased by 3,5 p. b. since 2005. Despite of ongoing efforts to eliminate poverty in the world, it still occurs and sometimes increases, such as in two adult households with three or more dependent children. For this type of household, Slovakia saw an increase in proportion of the people at risk of poverty by 5,7% The Czech Republic recorded a growth in the rate of poverty for households without dependent children of 0,4 p. b.
In 2013, the most vulnerable group was single-parent families with dependent children (30,1% in Slovakia and 27,8% in the Czech Republic).

Table 7 Poverty risk by type of household for the SR in%

| SR | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|
| **Combined SR** | 13.3 | 11.7 | 10.5 | 10.9 | 11 | 12 | 13 | 13.2 | 12.8 |
| **One person household** | 16.3 | 16.6 | 17.4 | 21.7 | 23 | 19.1 | 18.7 | 19.3 | 15.5 |
| **Household without dependent children** | 8.1 | 7.9 | 6.5 | 7.5 | 7.7 | 8.1 | 7.9 | 9 | 7.5 |
| **Household with dependent children** | 16.6 | 14.1 | 13.5 | 13.2 | 13.4 | 15 | 16.8 | 16.5 | 16.3 |
| **Lone-parent families with dependent children** | 31.8 | 29.4 | 26.3 | 20.9 | 23 | 25 | 26.4 | 27.5 | 30.1 |
| **2 adults with one dependent child** | 12.9 | 8 | 5.9 | 9.6 | 10.5 | 12 | 13.2 | 12.4 | 10 |
| **2 adults with 2 dependent children** | 16.7 | 13.6 | 12.3 | 10 | 9.9 | 11 | 13.1 | 14.3 | 13.2 |
| **2 adults with 3 or more dependent children** | 24.2 | 23.9 | 25.7 | 33.3 | 27.9 | 29.8 | 32.6 | 35.1 | 29.9 |

Source: Own processing of data obtained from the Statistical Office of the Slovak Republic

Table 8 Poverty risk by type of households in the Czech Republic in%

| Czech Republic | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|
| **Combined Czech Republic** | 10.4 | 9.9 | 9.6 | 9 | 8.6 | 9 | 9.8 | 9.6 | 8.6 |
| **One person household** | 16.4 | 17.1 | 15.9 | 18.5 | 19.5 | 18 | 18.2 | 14.9 | 14.7 |
| **Household without dependent children** | 6.7 | 6.2 | 5.7 | 6.9 | 6.4 | 6.5 | 7.1 | 7.5 | 7.1 |
| **Household with dependent children** | 13.8 | 13.2 | 13.2 | 11.1 | 10.5 | 11.4 | 12.4 | 11.6 | 10.1 |
| **Lone-parent families with dependent children** | 41 | 40.8 | 37.7 | 40 | 40.3 | 37.7 | 35.6 | 31.3 | 27.8 |
| **2 adults with one dependent child** | 8.8 | 7.6 | 6.9 | 6.4 | 4.6 | 7.9 | 6.8 | 6.8 | 8.5 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **2 adults with 2 dependent children** | 11 | 9.8 | 8.1 | 6.8 | 7.2 | 8.7 | 9.3 | 8.9 | 6.4 |
| **2 adults with 3 or more dependent children** | 24.7 | 29.5 | 29.9 | 19 | 23.1 | 20.9 | 23.9 | 22.4 | 13.8 |

Source: Own processing based on the findings of the Czech Statistical Office and Eurostat

In terms of economic activities, the groups most at risk are currently unemployed residents in both countries. In the Slovak Republic in 2013 this group suffered from poverty rates up to 43,8%, in absolute terms, 169 000 people, and in the Czech Republic they suffered from rates of 44,5% (in absolute terms 164 000 persons). By comparison, in 2012 we recorded a decrease in the SR people suffering from poverty after social transfers by 0,8 p. b., representing an annual decrease of more than 3 000 people. In the Czech Republic there was also an annual decrease of 1,2%, but after considering the number of persons unemployed in that year there was actually an increase in the number of people suffering from poverty to 171 400 people, which is 7 400 more than in 2013. The least affected group, for a given economic activity, for the whole period was the working population. Only 5,7% of workers in Slovakia and only 4% of workers in the Czech Republic were at risk of living in poverty in 2013. Compared to 2012 there was a reduction in the proportion of employed persons suffering from poverty by 0,5 p. b. for both countries. In 2013 Slovakia suffered from poverty, nearly 133,000 workers, which compared to 2012 represents a decline of 11 300 employed persons. Czech workers caught in poverty numbered 197 500 persons in 2013, which implies a reduction compared to 2012, when poverty was experienced by more than 220 000 workers. There was an almost 8% decline in the number of employed people at risk of poverty recorded in the period between 2005 to 2006 in the Czech Republic, and the percentage of unemployed people suffering from poverty was 7,5% in Slovakia for the years 2009 – 2010.

Table 9 Rate of risk of poverty after social transfers, by economic activity of population in%

| SR | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|
| **0-18 years old** | 11.9 | 10.2 | 9 | 9.6 | 9.7 | 10.6 | 11.4 | 11.5 | 11.1 |
| **In work** | 8.9 | 6.3 | 4.9 | 5.8 | 5.2 | 5.7 | 6.3 | 6.2 | 5.7 |
| **Not at work** | 15.3 | 15 | 14.1 | 14.5 | 15.3 | 16.1 | 16.9 | 17.3 | 16.8 |
| **unemployed** | 39 | 40.8 | 45.1 | 43.2 | 48.6 | 41.1 | 42.6 | 44.6 | 43.8 |
| **retired** | 6.9 | 8.1 | 8 | 9.7 | 8.9 | 6.7 | 6.3 | 7.7 | 6.6 |
| **other inactive persons** | 19 | 15.7 | 15.3 | 15.7 | 15.9 | 16.5 | 18.5 | 17.9 | 17.4 |

Source: Own processing based on the findings of the Slovak Statistical Office

Table 10 Rate of risk of poverty after social transfers, by economic activity of population in the Czech Republic in%

| Czech Republic | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|
| **0-18 years old** | 8.5 | 8.2 | 7.9 | 8 | 7.5 | 7.8 | 8.6 | 8.7 | 8 |
| **In work** | 3.5 | 3.5 | 3.3 | 3.6 | 3.2 | 3.7 | 4 | 4.5 | 4 |
| **Not at work** | 14.9 | 13.9 | 13.5 | 13.6 | 12.9 | 12.7 | 13.8 | 13.4 | 12.6 |
| **unemployed** | 51.1 | 43.3 | 48.6 | 47.8 | 46.9 | 40.6 | 46.4 | 46.7 | 44.5 |
| **retired** | 6.1 | 6.8 | 6.3 | 8 | 7.1 | 6.6 | 6.7 | 6.4 | 6.1 |
| **other inactive persons** | 16.1 | 14.8 | 13.1 | 12.4 | 13 | 12.9 | 14 | 13.7 | 11.9 |

Source: Own processing based on the findings of the Czech Statistical Office

The following tables show the number and proportion of persons at risk of poverty after social transfers are accounted for. In summary, the Slovak Republic recorded a higher proportion of people at risk of poverty for the whole period. We can say that the number of people suffering from the risk of poverty for both countries over the years has always changed and fluctuated. The highest recorded negative fluctuation was a 1,7% decline in 2005 – 2006, when the number of people at risk of poverty fell by 90 000 in the Slovak Republic. Conversely, the highest recorded positive fluctuation was a 1% growth measured in 2009 – 2010, when the number of exposed persons increased by 57 thousand in the Czech Republic. The CR also provides the highest decline in the poverty risk for the years 2007 – 2008 in the number of 40 000 persons per year and the highest growth in the period 2010 – 2011, when the number of people at risk of poverty increased by up to 86 000 a year.

Table 11 People at risk of poverty after social transfers in absolute and relative terms in the SR (in thous of Persons and in%)

| SR | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|
| **absolute expression** | 718 | 628 | 573 | 588 | 594 | 651 | 700 | 716 | 694 |
| **the relative expression** | 13.3 | 11.6 | 10.6 | 10.9 | 11 | 12 | 13 | 13.2 | 12.8 |

Source: Own processing based on the findings of the Slovak Statistical Office

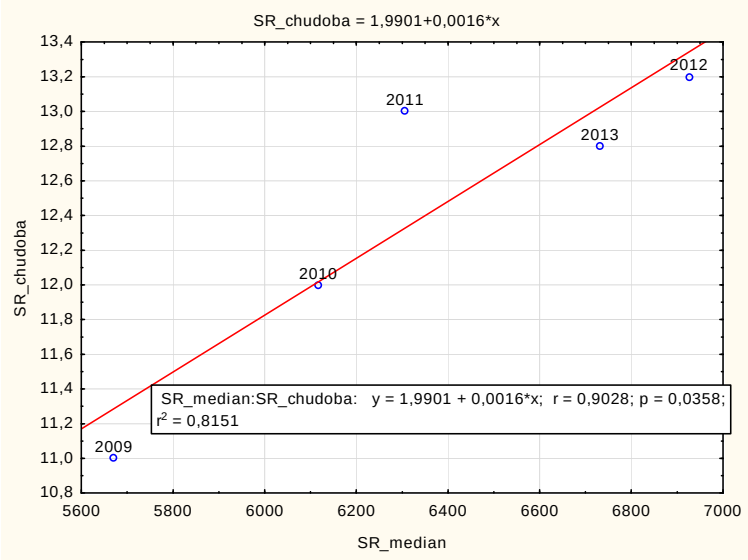
Table 12 People at risk of poverty after social transfers in absolute and relative terms in the Czech Republic (in thous. of Persons and in%)

| Czech Republic | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|
| **absolute expression** | 1 049 | 1 001 | 980 | 925 | 885 | 936 | 1 022 | 990 | 886 |
| **the relative expression** | 10.4 | 9.9 | 9.6 | 9 | 8.6 | 9 | 9.8 | 9.6 | 8.6 |

Source: Own processing based on the findings of the Czech Statistical Office

In the next text, we focus on the linear correlation dependence between selected variables concerning poverty. The linear correlation dependence of the total risk of poverty and median income (Fig. 1) is expected and obvious, to confirm it was sufficient took only 5 measurements. The chart shows fluctuations in income distribution in different years. It also points out that while in absolute terms in 2013 poverty rates compared to the previous two years were positive, i.e. decreased (there was a decrease compared to the previous data), but this happened while median income income (€ / year) decreased.

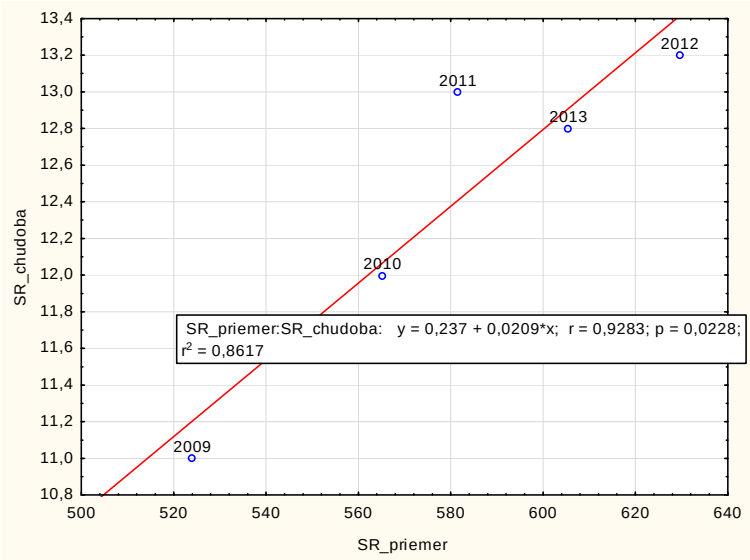
Fig 1: The linear correlation dependence of the total risk of poverty and median income




Source: Own processing

Like shape has a linear correlation dependence (Fig. 2) poverty rates and median income (€ / month).

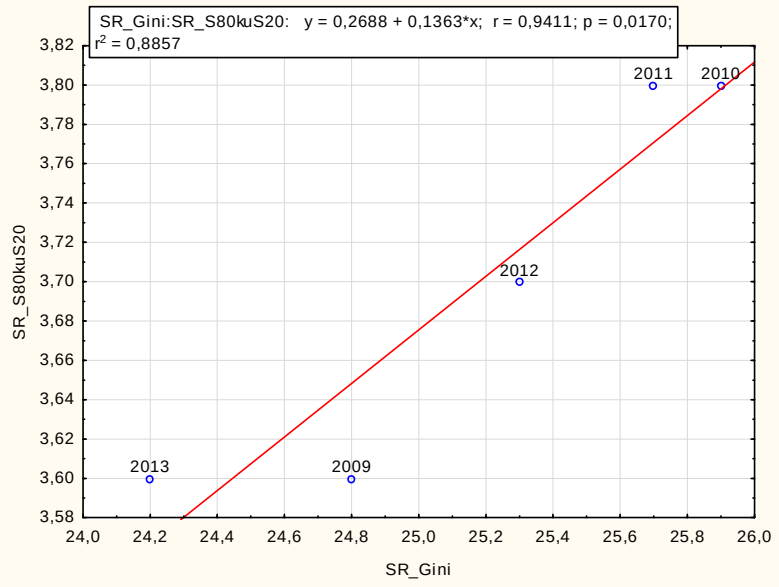
Fig 2: Like shape has a linear correlation dependence




Source: Own processing

Gini coefficient reached its lowest level in 2013, when the ratio of quintiles fell to the level of 2009. In view of these two indicators, 2013 can be evaluated as "a good year". A linear relationship between these two measures are also apparent (FIG. 3).

Fig 3: A linear relationship between these two measures are also apparent




Source: Own processing

According to a report on the EU-SILC 2013 survey on income and living conditions, it can be confirmed that Slovakia has long been one of the countries with significant economic and social disparities between regions. This difference is also reflected in the differences in median income, somewhat, However, compared to the previous year the order of regions in Slovakia, in terms of level of income, changed. The highest income level was recorded for persons living in the Bratislava region, where median equivalent disposable income was € 662/month. In other regions, this income ranged from € 514 (Prešov Region) to € 581 per person / month (Trencin region). Both of these are significantly less than what is earned in the Bratislava region.

## Conclusion

This paper describes the development of the basic indicators of poverty in Slovakia and at NUTS III, as well, as analysis of the income at the NUTS III level in the Slovak Republic and the Czech Republic.

In Slovakia, their is less talk about poverty and what talk there is does not always contain an understanding of what poverty is. But, poverty is slowly being accepted as part of the social order. Active inclusion of it in discussions is a cardinal tool for poverty reduction, while it is also necessary to achieve the Europe 2020 objectives on poverty with emphasis on reducing the number of poor people in Europe by 20 million by the year 2020. The reduction should be accompanied by an integrated approach of job creation and support income. It is expected that in Slovakia the issue of poverty, misery and inequality in the coming period will resonate more, which will in some way hopefully link into the pre-election struggle.

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# FLOODS AND THEIR (ECONOMIC) CONSEQUENCES IN DIFFERENT WORLD REGIONS, ESPECIALLY IN EUROPE

# POVODNE A ICH (EKONOMICKÉ) DÔSLEDKY V RÔZNYCH REGIÓNOCH SVETA S DÔRAZOM NA EURÓPU

***Abstract:*** *The paper deals with the positive and negative impacts of floods. The paper analysis of flooding damage in different parts of the world, especially Europe and Slovakia. The objective of this paper is to analyze flood damage in various regions of the world. The paper was developed based on data from secondary sources from the European Environment Agency and the Ministry of Environment of the Slovak republic. One single event may produce both benefits and losses to different parts of the riverine ecosystem. These impacts are extremely difficult to quantify or monetize e.g. by quantifying ecosystem services before and after an event or accounting for the number of fish killed or trees damaged. If more people are to dwell in vulnerable areas and more and more businesses settle down in these areas the more intensive effect a flood event will have upon society. Society is becoming more aware that floods can be controlled to a limited extent, and that absolute safety against floods is a myth.*
***Key words:*** *floods, flooding, process, management*

***Kľúčové slová:*** *povodne, záplavy, proces,manažment*

**JEL:** Q00, Q01

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## Introduction

The objective of this paper is to analyze flood damage in various regions of the world. For centuries and even millennia, people have been settling near rivers in order to till fertile soils, profit from flat terrain, have easy access to the water needed to sustain life, and use the river for transport. In days gone by, dwellings were typically constructed on higher land, while lower ground was used for farming. Riparian peoples benefited from the floods which have enriched the soil (irrigation and nutrient supply) and helped agriculture. In short, people lived in harmony with floods (Kundzewicz, 2004).

The frequency and consequences of extreme flood events have increased rapidly worldwide in recent decades (e.g. Bouwer et al. 2007; Kron 2009 in Zevenbergen, 2013).

The key drivers for these increases are the world's population growth and the increase in socioeconomic activities in flood-prone areas and significant climate change, which occurred in almost all countries of the world.

**Causes of floods**

The cause of floods are most frequently extremely heavy rains or sudden melting snow combined with significantly reduced ability, even inability of an area to retain rainwater (due to damage to the country – e. g. dried swamps or drained of agricultural land).

Flood risk may have increased due to a range of changes in the use of land, which induce changes of hydrological systems. Deforestation, urbanization, and reduction of wetlands cause a decrease in accumulation of water in the basin and increase the runoff. Urbanization has a negative impact on the risk of flooding by increasing impervious surfaces (roofs, roads, sidewalks, parking lots, etc.) (Kundzewicz, 2004). Extensive asphalted or concrete surfaces contribute to the rapid runoff of rainwater and the drying the soil under these built-up areas, including reduction of groundwater reserves and climate change in cities. These factors cause changes in drainage conditions and increase the risk of local flooding. According to EEA (2001) on average every 10 years a loss of 2% of agricultural land in Europe occurs.

The dried soil without anti-erosion measures (e.g. fields with an area of tens of hectares without any vegetation) behaves as an impermeable film. In such an affected land a flood wave can easily arise, which rises up to 3 or 4 meters within a few tens of minutes respectively hours, even at a creek which the water level of is typically 20 or 30 cm.

The countries face a wide variety of flood problems and have differing capacities to deal with these problems. Some countries are situated in temperate and monsoon-like climates, or have mountainous or flat floodplain-like features. Bangladesh has extensive floods every year, covering up to 30–60% of the country, whereas the Netherlands experienced real devastating floods for the last time in 1926 (rivers) and 1953 (storm surge).

Several sources of floods were identified: *(a)* floods that occur regularly in relation to yearly monsoon rainfall (Bangladesh, China, Vietnam), or *(b)* as sudden flash floods after torrential rains in mountainous areas (Argentina, Bangladesh, China, Croatia, Flanders, Indonesia, Japan, USA, UK, Vietnam). In addition, floods may occur *(c)* as rare events due to unusual combinations of rainfall and soil conditions (prolonged rainfall in combination with frozen or saturated soils, poor drainage or drainage congestion due to high river or sea levels, e.g. during typhoons or hurricanes (Croatia, Japan, USA) or floods may occur *(d)* due to embankment failure, e.g. due to poor maintenance (Croatia), inadequate construction or poor design (failures can occur everywhere) or riverbank erosion (Bangladesh).

Flood damage is most pronounced in urban areas, where high densities of people, assets and vulnerable infrastructure occur (Buenos Aires, Dhaka, Jakarta, Japanese cities, Croatian and Chinese floodplains). Extremely dangerous are low-lying polders behind embanked rivers, where flood levels may be 5 – 10 meters above ground level. This situation occurs in the river deltas of the Netherlands, China, Japan, USA and Bangladesh (Van Alphen, Lodder, 2006).

## Flood consequences

### Methodology

The paper was developed based on data from secondary sources from the European Environment Agency and the Ministry of Environment of the Slovak republic. Tables and graphs were prepared based on data from environmental organizations. All resources are put under the table or graph.

Impacts of floods due to high density of population, large impervious areas, clogging of drainage systems, high economic values of properties and infrastructures and various other effects can be: physical, economic, social and environmental (Tingsanchali, 2012). Random nature of flooding (frequency of occurrence, progress and culmination flow) is also reflected in the variability of flood damages, which are proportional to the damaging effects of floods, the extent of the flooded area and the degree of economic exploitation

In general, we can divide the flood losses:

- losses on human life;
- ecological losses;
- economical losses.

The consequences of all natural disasters are always twofold. Primarily produced damage caused by the action of natural forces themselves. Direct flood damage covers all varieties of harm which relate to the immediate physical contact of flood water on humans, property and the environment. This includes, for example, damage to buildings, economic goods and dykes, loss of standing crops and livestock in agriculture, loss flood damage, vulnerability and risk perception of human life, immediate health impacts, and contamination of ecological systems. Indirect or consequential effects comprise damage, which occurs as a further consequence of the flood and the disruptions of economic and social activities for example interruptions of energy supplies, interruption of communication links, water logging buildings, contamination of drinking water sources, environmental accidents and more. This damage can affect areas quite a bit larger than those actually inundated. One prominent example is the loss of economic production due to destroyed facilities, lack of energy and telecommunication supplies, and the interruption of supplies of intermediary goods. Other examples are the loss of time and profits due to traffic disruptions, disturbance of markets after floods (e.g. higher prices for food or decreased prices for real estate near floodplains), reduced productivity with the consequence of decreased competitiveness of selected economic sectors or regions and the disadvantages connected with reduced market and public services (Smith/Ward 1998, Green et al.1994 in Messner, Meyer, 2005). Primary and secondary effects of large-scale flood disasters are a particularly serious source of risk to the society in terms of impact on it, the property and the land.

Flood losses can be distinguished as (Hanák et al., 2009):

- direct calculable losses (caused by immediate contact with water – property losses, contamination, …);
- direct non - calculable losses (caused by immediate contact with water - victims, losses on historical buildings, destruction of biotopes, subjective losses on property, …);
- indirect calculable losses (profit loss, purchasing power decrease, decrease of real property prices, evacuation costs, …);
- indirect non-calculable losses (social life failure – education, increased rate of sickness).

Financial consequences of floods, which can be directly quantified, include flood damages by themselves and the cost of rescue and security works (Table 1).

Table 1: Overview of expenditure for the implementation of flood safety and rescue works and flood damage in the period 2002 – 2013 in Slovakia in Eur:

| Year | Flood security works | Flood rescue works | Flood works (together) | Flood damages | Flood damages and works (together) |
|---|---|---|---|---|---|
| **2002** | 1 664 177.12 | 1 927 072.96 | 3 591 250.08 | 50 644 393.55 | 54 235 643.63 |
| **2003** | 139 314.88 | 188 773.82 | 328 088.70 | 1 457 412.20 | 1 785 500.90 |
| **2004** | 3 416 915.62 | 1 235 842.79 | 4 652 758.41 | 34 913 496.65 | 39 566 255.06 |
| **2005** | 2 674 135.30 | 2 236 241.12 | 4 910 376.42 | 24 045 973.58 | 28 956 350.00 |
| **2006** | 6 424 815.77 | 6 053 508.60 | 12 478 324.37 | 79 602 237.27 | 92 080 561.64 |
| **2007** | 212 374.69 | 319 358.69 | 531 733.38 | 3 638 949.74 | 4 170 683.12 |
| **2008** | 2 514 937.00 | 3 586 769.00 | 6 101 706.00 | 39 754 597.00 | 45 856 303.00 |
| **2009** | 1 591 301.00 | 1 301 334.00 | 2 892 635.00 | 8 436 354.10 | 11 328 989.10 |
| **2010** | 28 041 650.00 | 25 751 090.00 | 53 792 740.00 | 480 851 66.30 | 534 644 403.34 |
| **2011** | 12 573 473.82 | 2 001 204.36 | 14 574 678.18 | 20 017 256.53 | 34 591 934.71 |
| **do 8/2012** | 460 623.91 | 369 427.02 | 830 050.93 | 2 435 268.39 | 3 265 319.32 |
| **9/2012 – 6/2013** | 4 518 834.57 | 2 648 270.81 | 7 167 105.38 | 12 782 551.26 | 19 949 656.64 |
| **7/2013 – 12/2013** | 231 642.20 | 81 634.11 | 313 276.31 | 678 046.16 | 991 322.47 |
| **Ø 2002 – 2013** | 5 372 016.32 | 3 975 043.94 | 9 347 060.26 | 63 271 516.65 | 72 618 576.91 |

Source: Prepared on the basis of data from “the Report on the progress of the flood” (www.minzp.sk)

Increase in economic losses due to natural disasters is closely associated with the increasing value of assets exposed to risk. During the 20th century in all economically developed countries a continuous increase in the value of tangible and intangible assets which are the subject of threats to natural processes occurs. The value of endangered assets and volume of total insured property is growing faster than the intensity of natural threats (Messner, Meyer, 2005).
The total damage potential, which represents the maximum possible damage incurred as a result of the process, is influenced by the structure, value and deployment of assets in floodplains. The actual amount of flood damage of a specific flood event depends on the vulnerability of the affected socio-economic and ecological systems, i.e. on their potential to be harmed by a hazardous event (Cutter 1996, Mitchell 1989 in Messner, Meyer, 2005). The vulnerability of socio-economic structures is reflected into a growing dependence on sophisticated technology and communications systems. In the event of their collapse the dependence of all management systems for electricity supply for computing, information and communication systems, telecommunication networks and transportation causes greater chaos and harm than in the less advanced systems. In crisis situations the ability to deliver the right information at the right place at the right time and in the correct form plays a decisive role for the functioning of the rescue system. Timely and correct information and communication functionality have proved to be one of the major problems which marred the solution of flood situation in extreme floods for example in August 2002 in the Czech Republic, despite the experience of the floods in the year 1997 in Moravia (Langhammer, 2007B).

Growth flood damage is influenced by various factors such as (Langhammer, 2007B):

- The way the space is built;
- The way floods behave (culmination flow, shape and volume of flooding, duration of flooding ...);
- Bed capacity, condition and ability to withstand more water;
- Timely awareness of flood risks (weather, warning system);
- Preparedness and level of flood protection.

In addition to economic and social damage, floods may have severe environmental consequences (COM, 2004) as for example when waste water treatment plants are inundated or when factories holding large quantities of toxic chemicals are also affected. Floods may also destroy wetland areas and reduce biodiversity. There is also a growing awareness of the significance of river flooding on human health, both physical and psychological. Substantial health implications can occur for example when floodwaters carry pollutants, or are mixed with contaminated water from drains and agricultural land. There will be mental health consequences as well: in addition to the considerable stress of extensive damage, the threat of repeated floods, sometimes coupled with possible withdrawal of insurance cover can make properties impossible to sell.

**FACTS – Analysis of flood damages in varions of the world**

Since the early 20th century to the present day, there is a significant increase to the extent of damage caused by natural disasters. Only for the period since World War II the total average amount of damage per decade increased almost tenfold (Munich Re 2005 in Langhammer, 2007A). The most characteristic feature for the current disasters is the growing extent of the damage made in a single event while at the same time a greater population and greater expanse of territory are affected (Axco 2005, Munich Re 2005 in Langhammer, 2007A). While in the 1980s annually 147 million inhabitants have been affected by natural disasters, it was already 211 million inhabitants in the 1990s (UNEP 2005 in Langhammer, 2007A). Social and economic impacts of natural disasters vary considerably. There is a continuously decreasing total number of victims of natural disasters, while direct and induced economic losses are growing rapidly (UNEP 2005 in Langhammer, 2007A).

According to data from Swiss Re an event is considered a disaster where there are at least 20 victims, 2 000 people homeless and over 335 million USD insurance claims (Čamrová, Jílková, 2006). Floods are the most common natural disasters and represent 40% of all natural disasters between the years 1985 – 2009 (Cunado and Ferreira, 2011 in Soukopová, Furová, 2012).

During the last few decades, however, increased attention has been paid to the consequences of floods and measures that could be developed to reduce the effects of a flood. This has been triggered by the observation that economic and insured losses due to “extreme” floods have drastically increased during the last two decades (Munich RE, 2005) even though flood protection investments have also increased.

The main explanation for this trend can be found in socioeconomic development and spatial planning policies, as it appears that wealth and exposure have increased in flood-prone areas (Munich RE, 2005; EEA et al., 2008). Even in areas where the overall population growth is slowing down (for example, along the Rhine river), population growth in cities along rivers tends to be increasing (LDS NRW, 2008 in De Moel et al., 2009). Flood-prone areas remain attractive for socioeconomic activities and it is therefore likely that the damage potential (that is the amount of assets in flood-prone areas) will continue to increase in the future.

Using data compiled according to the Red Cross for the period 1971 – 1995 we find that the floods have killed annually on average more than 12 700 people worldwide, affected 60 million others and caused 3.2 million people to became homeless (Kundzewicz, 2004). Since 1990, there have been over 30 floods, in each of which either the material losses exceeded one billion USD, or the number of fatalities was greater than 1000, or both. The highest material flood losses, of the order of 30 billion USD, were recorded in China in the summer of 1998, while a storm surge in Bangladesh in April 1991 caused the highest number of fatalities (about 140 000). Flood damage in Europe in the period 1991 – 1995 reached the level of 99 billion EUR (EEA, 2001).

Countries such as Bangladesh and China have suffered at least 2.5 million victims in the last 100 years in major floods. In Europe, the loss of life has been a matter of

thousands in the past century. In the last decade, in terms of casualties, major riverine flooding has occurred in Vietnam in 1997 (3000), Bangladesh in 1998 (1100) and China in 1998 (1320). In economic terms, major floods of the past decade were along the Mississippi (1993, 21 billion USD), Jang – c' (1998, 30 billion USD) and in Central Europe (2002, about 20 billion USD). In terms of loss of GNP, the most devastating floods occur in developing countries: the 1998 and 2004 floods in Bangladesh caused damage of 2.8 and 2.2 billion USD, i.e. about 7% of their GNP. In China flood damage accounts for 1–3% of its GNP every year, whereas in Japan it accounts for about 0.1%. The wealth of a country determines the amount of funds that can be spent on flood protection and can be expressed through the annual income per capita. In the countries concerned, this varies from less than 2000 USD in Bangladesh to about 40000 USD in the USA (Van Alphen, Lodder, 2006).

Although most dramatic extreme floods occur outside Europe (especially in South Asia), Europe is not immune. There have been several flood events with material damage in excess of 1 billion EUR and the growing flood damage has intensified concern among European nations. After the flood-rich decade of the 1990s, with many disastrous flood events in Europe, the 21st century has already witnessed several destructive floods. Among the destructive floods in Europe in the 1990s were flooding in the basins of the River Rhine and its tributaries (1993, 1995), in the Mediterranean region (1994) and in Central Europe (1997). The flood on the Rhine in December 1993 caused inundation of parts of the cities of Koblenz, Bonn and Cologne and then in January and February 1995 another large flood hit Germany, northern France and The Netherlands. Dramatic floods devastated large areas in the Czech Republic, Poland and the Oder basin in Germany in July 1997. Major floods occurred in the UK, Italy, France and Switzerland in the year 2000. The absolute record of annual flood loss in Europe was observed in August 2002, when the material damage exceeded 20 billion EUR in nominal value (Table 2). This flood damaged the historical cities of Prague and Dresden. Major large floods also occurred in Europe in 2005, 2007 and 2010 (Kundzewicz, Pińskwar and Brakenridge, 2013). After a heavy rainfall there has also been a dramatic increase in the levels of European rivers in 2013, as for example in Germany and the Czech Republic which also brought casualties and the declaration of the highest level of flood activity.

Table 2: Floods in Europe with significant consequences

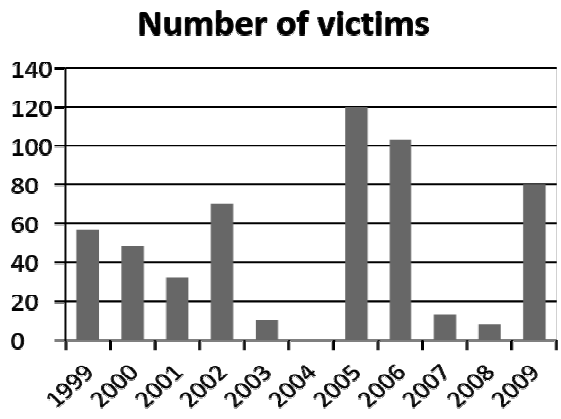
| Year | Month | Area | Number of victims | Economic losses (mil. EUR) |
|---|---|---|---|---|
| **1999** | **May** | Germany (Bavaria), Switzerland, Liechtenstein and Austria | **5** | **805** (370 Germ. + 435 Switz.) |
| | **June** | Romania | **19** | |
| | **November** | France | **33** | **570** |
| **2000** | **April** | Romania, Hungary, Serbia, Ukraine | **9** | **400** (Rom.) |
| | **Oct.-Novem.** | England and Wales | **10** | **1400** |
| | **October** | Italy, French, Swiss and Italian Alps | **29** | **11700** |
| **2001** | **June** | Romania | **7** | **220** |
| | **July** | Poland | **25** | **810** |
| **2002** | **August** | Germany, Czech Republic, Austria | **47** | **20900** (13700 Germ. + 3500 Czech Rep. + 3700 Austria) |
| | **September** | France | **23** | **1500** |
| | **Nov.-Dec.** | Italy | | **440** |
| **2003** | **January** | Italy | | **150** |
| | **February** | Greece | | **650** |
| | **August** | Italy | **3** | **510** |
| | **December** | France | **7** | **1600** |
| **2004** | **August** | England | | **700** |
| **2005** | **April-May** | Romania and Serbia | | **565** |
| | **May - August** | Bulgaria | **24** | **335** |
| | **July - August** | Romania | **85** | **1200** |
| | **August** | Switzerland, Austria, Germany | **11** | **2810** (190 Germ. + 620 Austria + 2000 Switz.) |
| **2006** | **March** | Greece | | **410** |
| | **March - May** | Hungary, Slovakia, Serbia, Czech Republic, Austria and Germany | **12** | **800** (590 Hungary + 210 Czech Rep.) |
| | **June** | Romania | **44** | |
| | **Oct.-Novem.** | Turkey | **47** | **265** |
| **2007** | **May** | Spain | | **310** |
| | **June** | England | | **270** |
| | **June** | Northern England and Wales | **6** | **1900** |
| | **July** | England | **7** | **1900** |

| | | | | |
|---|---|---|---|---|
| | **August** | Switzerland | | **290** |
| | **September** | Slovenia | | **245** |
| **2008** | **July** | Romania | **5** | **440** |
| | **December** | Italy | **3** | **290** |
| **2009** | **June** | Czech Republic and Poland | **14** | **450** (200 Czech Rep. + 250 Poland) |
| | **September** | Turkey | **31** | **100** |
| | **October** | Italy | **35** | |
| | **November** | England and southern Scotland | | **230** |

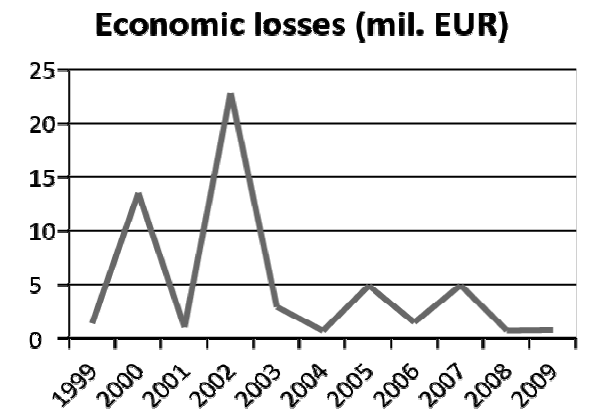
Source: EEA. 2010

The direct economic losses from the major events between 1999 and 2009 were about 55 billion EUR. The most destructive events in terms of economic losses were: the floods in the Elbe basin in 2002 that produced losses of over 20 billion EUR; floods in Italy, France and the Swiss Alps in 2000 causing around 12 billion EUR and a series of flood events in the United Kingdom during summer 2007 accumulating in losses of more than 4 billion EUR Several areas were affected several times in a relatively short period of time. This is the case of England (Worcestershire and Gloucestershire) where two major events were reported in 2007. Also north-east Romania and Bulgaria experienced repeated flooding. Two particularly large floods hit both countries within just a few weeks of each other during the summer of 2005 (EEA, 2010).
The graph 1 and graph 2 bind to Table 2. The horizontal axis is years. The vertical axis is the number of victim (Graph 1) and economic losses in million Eur (Graph 2).

Graph 1: Numbers of victims




Graph 2: Economic losses




Source: Prepared on the basis of data from EEA 2010

The countries registering the highest economic losses were Germany (14.26 billion EUR), Italy (13.1 billion EUR), United Kingdom (6.4 billion EUR), Austria (4.32 billion EUR), Czech Republic (3.91 billion EUR), France (3.67 billion EUR), Romania (over 2.82 billion EUR) and Switzerland (over 2.72 billion EUR).

Flood events resulted (in the reporting period) in around 541 human fatalities. The most fatal events occurred in Romania with 85 people killed in 2005, in Turkey with 47 and in Romania 44 killed in 2006 and in Italy with 35 killed in 2009. It seems that there is no evident trend over time in respect of the number of fatalities. This is because the number of deaths is very much dependent on single events. Furthermore, in the past few years early warning systems and prevention measures have improved evacuation procedures in the areas exposed to floods (EEA, 2010).

Flooding, along with wind related storms, is the most important natural hazard in Europe in terms of economic loss (CRED 2009 in EEA, 2010). In central Europe, floods have been recently recognized as a major hazard, in particular after the 1997 Odra/Oder flood, the 2001 Vistula flood, and the most destructive 2002 flood on the Elbe, the Danube, and their tributaries. It is estimated that the material flood damage recorded across the continent of Europe in 2002 was higher than in any single previous year. According to Munich Re (2003), the floods in August of 2002 alone caused damage at a level exceeding 15 billion EUR (9.2 billion EUR in Germany, after 3 billion EUR each in Austria and in the Czech Republic). Further, during severe storms and floods on 8 – 9 September 2002, 23 people were killed in southern France (Rhone valley), while the total losses went up to 1.2 billion USD. Destructive flood events occurred in many other parts of the world in 2002. In July and August, floods and landslides in northeastern and eastern India, Nepal and Bangladesh killed 1200 people. A flood in central and western China in June caused 3.1 billion USD losses and killed 500 people, while another in central and southern China, caused 1.7 billion USD damage and killed 250 people (EEA, 2010).

Floods in 2013, which affected parts of Europe, Asia, Canada and Australia have caused about 47% of total global losses and 45% of insured losses (Munich Re, 2013). The most deadly disaster of the 460 recorded "natural hazard events" worldwide in 2013 was the series of flash floods in June in northern India and Nepal, which killed more than 1,000 people after extremely heavy monsoon rains. By far the costliest natural disaster were river floods that hit the southern and eastern Germany and neighboring countries in May and June 2013 and caused damage worth more than 16 billion USD (mostly in Germany). In some places the rainfall was up to 400 liters per square meter within a period of a few days, which led to rapid increase in river systems of the Danube and Elbe (Munich Re, 2013).

In 2013 Slovakia faced a record-high level of the Danube. Flood wave came from Germany and then from Austria. According to estimates it was historically the third largest flood in Bratislava (in terms of maximum flow), more water has not passed the river bed in the last 113 years. The water level peaked in the Capital at up to 1034 cm at a maximum flow rate of 10 641 $m^3$/ s. The Danube basin faced a hundred-year water level and Slovakia passed this test. Without the flood protection (the project was worth 32.5 million EUR, of which Slovakia co-financed about 4.8 million EUR) the water level would reach, in theory, a level of 1.25 m at the Courthouse ("Justičný palác"), 2.5 m at the well-known shopping center on Vajnorska street and even 4 m at the Ružinovská polyclinic. Reported damage to

public and private property, that is, for example, municipalities, autonomous regions, local offices or individuals after the flood on the Danube in 2002 reached 5.079 million EUR. Damages in 2013 represented less than 2% of this amount or vice versa, damages in Bratislava in 2013 were about 98% lower than in 2002 (MŽP SR, 2013).

## Conclusion

Floods in the past brought humanity many positive effects as floods in the Nile, which helped ensure the livelihood of the population in ancient Egypt. Only when the floods began to threaten the lives, health and property of the population and economic activities of society, they became a serious problem for the mankind. Not the nature can be held responsible for the fact that the floods are harmful to society, but the people because they take natural space from water and put themselves in her way (MŽP SR, 2010). On the other hand, building of settlements in the watercourses was necessary because rivers provided enough water to cater for the necessities of life and the most fertile land due to floods is in riverside floodplains. Society is becoming more aware that floods can be controlled to a limited extent, and that absolute safety against floods is a myth.

The flood as a natural hazard has effect on the stability of society. If more people are to dwell in vulnerable areas and more and more businesses settle down in these areas the more intensive effect a flood event will have upon society (Seifert, 2012). It will be necessary to evacuate more buildings, provide emergency accommodation for more people, more workers will not be able to make money, because they will have to rescue and look after their property. More and more companies will have to suddenly cease production, services will no longer be provided, unexpected shortfalls in tax receipts shall bring the municipal budgets out of balance and public services will no longer be funded. The infrastructure to repair after a flood event will also be more extensive.

One single event may produce both benefits and losses to different parts of the riverine ecosystem. These impacts are extremely difficult to quantify or monetize e.g. by quantifying ecosystem services before and after an event or accounting for the number of fish killed or trees damaged. Regular annual floods provide water resources for domestic supply, irrigation or industrial use. Some of the most important benefits of floods are linked to the maintenance of biological diversity in the flood plain ecology (Smith and Ward, 1998). Furthermore, many rivers carry minerals and nutrients which support agricultural production on the flood plains. Another aspect that makes it difficult to quantify the ecological consequences of floods is that some of the benefits from floods tend to become evident months or years after the event, or are often not apparent at all (e.g. recharging of groundwater stocks). This suggests that any immediate ecological accounting is prone to error (NRC, 1999). Flooding in river ecosystems should be regarded as a natural process and not as a disturbance.

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