THE REDUCTION OF UNCERTAINTY IN MAKING DECISIONS BY EVALUATING THE MACROECONOMIC FORECASTS PERFORMANCE IN ROMANIA

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ABSTRACT

The evaluation of macroeocnomic forecasts performance does not include only the calculating of some statistical measures, rather controversial in literature, like root mean squares error or absolute mean error. In theory and economic practice, three directions have been traced regarding the evaluation of forecasts performance: the analyse of accuracy, bias and efficiency. Using the forecasted values on medium run of inflation rate and unemplyment rate through the period from 2004-2010 in Romania, we get a better degree of accuracy and a lower efficiency for forecasts made by National Commission of Forecasting comparing to those based of Dobrescu model used by Institute of Economic Forecasting. Following the international tendency, the forecasts are, in all cases, biased because of difficulties in precise anticipation of shocks which affect the economy. Forecasts performance is indestructible related by their uncertainty, RMSE, the measure of evaluating the accuracy being used in building forecast intervals based on historical errors. For forecasted values of inflation rate published by National Bank of Romania we propose a new way of building forecast interval in order to take into account the economic shocks.

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I. INTRODUCTION

In addition to economic analysis, the elaboration of forecasts is an essential aspect that conducts the way of developing the activity al macroeconomic level. But any forecast must be accompanied by macroeconomic explanations of its performance. The purpose of this evaluation is related to different aspects: the improvement of the model on which the forecast was based, adjustment of gouverment policies, the planning of results. Basically, performance evaluation in this context refers directly to the degree of trust confered to the prediction. Although the literature on forecasting methods and techniques used in describing the evolution of an economic phenomenon is particularly rich, surprisingly, few researchers have dealt with the methods used to improve the measurement of forecast uncertainty. The aspect is important, because the macroeconomic predictions must not be easily accepted, taking into account the negative consequences of macroeconomic forecasts failures, consequences that affect the state policies. The decisions of economic policy are based on these forecasts. Hence, there is an evident interest of improving their performance.

In literature there are 3 directions in evaluating the performance of macroeconomic forecasts: accuracy, bias and efficiency.A large number of articles have considered the problem of comparing the accuracy measures, contributions in the field are related of names like: Leith and Tanner-1990, Makridakis- 1993, Yokum and Armstrong-1995, Tashman-2000, Makridakis and Hibon-2000, Koehler, Martin şi Witt -2002, Hyndman -2006 . and Witt -2002, Hyndman-2006.

Meese and Rogoff's paper, „ Empirical exchange rate models of the seventies", remains the starting point for many researches on the comparing of accuracy and bias. Recently, Dovern J. and J. Weisser (2011) examines in the same article, „ Accuracy, unbiasedness and efficiency of professional macroeconomic forecasts: An empirical comparison for the G7" the three criteria using the empirical data from the G7 economies.

II. FORECASTS ACCCURACY IN LITERATURE

Forecast accuracy is a large chapter in the literature related to the evaluation of forecasts uncertainty. There are two methods used in comparing the prediction quality: vertical methods (eg, mean squared error) and horizontal methods (such as distance in time). An exhaustive presentation of the problem taking into account all the achievements in literature is not possible, but will outline some important conclusions.

In order to evaluate the forecast performance, and also to order the predictions, statisticians have developed several measures of accuracy. Fildes R. and Steckler (2000) analyze the problem of accuracy using statistics, indicating landmarks in the literature. For comparison between the MSE indicators of the forecasts, Granger and Newbold propose a statistic. Another statistic is presented by Diebold and Mariano in order to compare other quantitative measures of errors. Diebold and Mariano were proposed in 1995 a comparison test of two forecast's accuracy under the null hypothesis that states the lack of difference. The test proposed by them was later improved by Harvey and Ashley, who developed a new statistic based on a bootstrap inference. Later, Christoffersen and Diebold have developed a new way of

measuring the accuracy that keeps the cointegration relationship between variables.

Armstrong and Fildes (1995) shows that the purpose of measuring forecast error is the provision of information about the shape of errors distribution and proposed a loss function for measuring the forecast error. Armstrong and Fildes show that it is not sufficient to use a single measure of accuracy.

Mariano R.S. (2000) presents the most significant tests of forecasts accuracy, including the changes of his test- Diebold Mariano (DM). Since the normal distribution is a poor approximation of the distribution of low volume data series, Harvey, Leybourne, and Newbold improve the properties of finite data sets, applying some corrections: the change of DM statistics to eliminate the bias and to make comparison not to normal distribution, but to the t-Student. Clark evaluates the power of some tests of equal forecast accuracy, such as modified versions of DM test or those of Newey and West, which are based on the Bartlett kernel and a fixed length of data series. Meese and Rogoff in their study from 1983, " The empirical exchange rate models of the seventies " compared the RMSE and the bias of exchange rate forecasts, that were based on structural models and they made a conclusion that was later used to improve macroeconomic forecasts performance. They have thus demonstrated that random walk process generates better forecasts than structural models.

In the evaluation of a forecast based on a model, Clements and Hendry (2005) identify six important aspects to be studied: ex-ante and ex post, evaluation, forecast horizon length, the quality of a model to be conditional or not, internal and external standards, testing the stability and the significance of the models, testing parameters stability and assurance of their continuous updating.

In literature, there are several traditional ways of measurement, which can be ranked according to the dependence or independence of measurement scale. A complete classification is made by RJ Hyndman and AB Koehler (2005) in their reference study in the field, "Another Look at Measures of Forecast Accuracy ":

- Scale-dependent measures

The most used measures of scale dependent accuracy are:

-> Mean-Square Error (MSE) = average (e_t^2)

-> Root Mean Square Error (RMSE) = $\sqrt{MSE}$

-> Mean Absolute Error (MAE) = average ($|e_t|$)

-> Median Absolute Error (MdAE) = median ($|e_t|$)

RMSE and MSE are commonly used in statistical modeling, although they are affected by outliers more than other measures.

- Scale-independent errors:

-> Measures based on percentage errors

The percentage error is given by: $p_t = \frac{e_t}{X_t} \cdot 100$

The most common measures based on percentage errors are:

* Mean Absolute Percentage Error (MAPE) = average ($|p_t|$)

* Median Absolute Percentage Error (MdAPE) = median ($|p_t|$)

* Root Mean Square Percentage Error (RMSPE) = geometric mean (p_t^2)

* Root Median Square Percentage Error (RMdSPE) = median (p_t^2)

When X_t takes the value 0, the percentage error becomes infinite or it is not defined and the measure distribution is highly skewed, which is a major disadvantage. Makridakis introduced symmetrical measures in order to avoid another disadvantage of MAPE and MdAPE, ie, too large penalizing made to positive errors in comparison with the negative ones.

* Mean Absolute Percentage Error (sMAPE) = average ($\frac{|X_t - F_t|}{X_t + F} \cdot 200$)

* Symmetric Median Absolute Percentage Error (sMdAPE) = median ($\frac{|X_t - F_t|}{X_t + F} \cdot 200$),where F_t - forecast of X_t.

-> Measures based on relative errors

It is considered that $r_t = \frac{e_t}{e_t^*}$, where e_t^* is the forecast error for the reference model.

* Mean Relative Absolute Error (MRAE) = average ($|r_t|$)

* Median Relative Absolute Error (MdRAE) = median ($|r_t|$)

* Geometric Mean Relative Absolute Error (GMRAE) = geometric mean ($|r_t|$)

A major disadvantage is the too low value for the error of benchmark forecast.

For example, the relative RMSE is calculated: $rel\_RMSE = \frac{RMSE}{RMSE_b}, where\ RMSE_b$ is the RMSE of "benchmark model"

Relative measures can be defined for MFA MdAE, MAPE. When the benchmark model is a random walk, it is used rel_RMSE, which is actually Theil's U statistic. Random walk or naive model is used the most, but it may be replaced with naive2 method, in which the forecasts are based on the latest seasonally adjusted values.

- Free-scale error metrics (resulted from dividing each error at average error)

Hyndman and Koehler introduce in this class of errors "Mean Absolute Scaled Error " (MASE) in order to compare the accuracy of forecasts of more time series.

Other authors, like Fildes R. and Steckler H. (2000) use another criterion to classify the accuracy measures. If we consider, $\hat{X}_t(k)$ the predicted value after k periods from the origin time t, then the error at future time (t+k) is: $e_t(t+k)$. Indicators used to evaluate the forecast accuracy can be classified according to their usage. Thus, the forecast accuracy measurement can be done independently or by comparison with another forecast.

A. Independent measures of accuracy

In this case, it is usually used a loss function, but we can also choose the distance criterion proposed by Granger and Jeon for evaluating forecasts based on economic models. The most used indicators are:

a) Mean Square Error (MSE)

b) Root Mean Squared Error (RMSE)

c) Generalized Forecast Error Second Moment (GFESM)

d) Mean Absolute Percentage Error (MAPE)

e) Symmetric Median Absolute Percent Error (SMAPE)

f) Mean error (ME)

g) Mean absolute error (MAE).

In practice, the most used measures of forecast error are:

- Root Mean Squared Error (RMSE)

$$RMSE = \sqrt{\frac{1}{n}\sum_{j=1}^{n} e_X^2(T_0 + j, k)} \tag{1}$$

Mean error (ME)

$$ME = \frac{1}{n}\sum_{j=1}^{n} e_X(T_0 + j, k) \tag{2}$$

The sign of indicator value provides important information: if it has a positive value, then the current value of the variable was underestimated, which means expected average values too small. A negative value of the indicator shows expected values too high on average.

- Mean absolute error (MAE)

$$MAE = \frac{1}{n}\sum_{j=1}^{n} \left| e_X(T_0 + j, k) \right| \tag{3}$$

These measures of accuracy have some disadvantages. For example, RMSE is affected by outliers. Armstrong and Collopy stresses that these measures are not independent of the unit of measurement, unless if they are expressed as percentage. Fair, Jenkins, Diebold and Baillie show that these measures include average errors with different degrees of variability. The purpose of using these indicators is related to the characterization of distribution errors. Clements and Hendry have proposed a generalized version of the RMSE based on errors intercorrelation, when at least two series of macroeconomic data are used. If we have two forecasts with the same mean absolute error, RMSE penalizes the one with the biggest errors.

B. Measures for the evaluation of the relative accuracy of forecasts

Relative accuracy measures are related to the comparison of the forecast with a forecast of reference, found in the literature as the 'benchmark forecast' or 'naive forecast. However, it remains a subjective step to choose the forecast used for comparison Problems may occur in this case are related to these aspects: the existence of outliers or inappropriate choice of models used for predictions and the emergence of shocks. A first measure of relative accuracy is Theil's U statistic, which uses as reference forecast the last observed value recorded in the data series. Collopy and Armstrong have proposed instead of U a new similar indicator

(RAE). Thompson improved MSE indicator, suggesting a statistically determined MSE- log mean squared error ratio.

A common practice is to compare the forecast errors with those based on a random-walk. "Naïve model" method assumes that the variable value in the next period is equal to the one recorded at actual moment. U-Theil proposed the calculation of U, that takes into account both changes in the negative and the positive sense of an indicator:

$$U = \sqrt{\frac{\sum (X_{t+k} - \hat{X}_t(k))^2}{\sum X_{t+k}^2}} \tag{4}$$

Hyndman and Koehler proposed scale errors based on the mean absolute error of a naive forecasting method. MAE serves therefore, as denominator. Using this method, it is generated the one-step-ahead forecast. Scale error is defined as:

$$es_t = \frac{e_t}{\frac{1}{n-1}\sum_{i=2}^{n} |X_i - X_{i-1}|} \tag{5}$$

and mean absolute scale error as: MASE= mean $| es_t |$.

Naive forecast values are considered to be the current ones recorded during the previous period. MASE is used both to compare forecast methods applied to a given set of data and also to compare the accuracy of several series. If the scale error is less than 1, the compared forecast is better than the reference one (naïve forecast).

One of the business objectives in forecasting was empirical validation. Famous results have been registered by Makridakis and Hibon, who lead research groups around the world to make comparisons between different methods of forecasting. In literature the results are known as "M-competitionEx-ante forecast errors for 21 methods were compared with predictions based on 1001 economic series. Accuracy criteria used in the M competition were: central tendency error (APE median), MSE, which gives more weight to larger error, MAPE, which is the basic measure. This is the measure recommended in reference books in forecast accuracy domain, written by Hanke and Reitsch or Bowerman, O'Connell and Koehler.

Armstrong and Collopy use MdRAE, MdAPE and GMRAE, the last two measures being also recommended by Fildes, who also uses GRMSE (geometric mean squared relative error). In M3 competition, Makridakis and Hibon recommended MdRAE, sMAPE and sMdAPE.

Clements and Hendry propose a linear transformation of original series and the robustness evaluation of a measure used to quantify the error.

It is made distinguish between errors within the actual data series and errors on forecast horizon, which is enshrined in the literature as in sample errors out sample errors. A part of the forecast errors are generated by the fact that the series is affected by errors and by

the forecast itself. One-step-ahead errors must be, normally, uncorrelated and of zero mean, conditions to be respected also by in sample and out sample errors. Some authors recommend the use of Kullback-Leibler divergence in order to compare the forecasts in terms of accuracy.

Kullback-Leibler distance (divergence) (KL) also known as informational divergence or relative entropy is an essential indicator used in statistics and information theory. It is used in hypothesis testing, adaptive estimation, estimation of maximum or minimum function. KL divergence between two probability densities, A and B, defined on a discrete finite set X is:

$$D(A||B) = \sum_{x \in X} A(x) \cdot \log \frac{A(x)}{B(x)} = E(\log \frac{A(x)}{B(x)}). \tag{6}$$

In the continuous case, if a and b are two probability densities with the mean m, then:

$$D(a||b) = \int a \log \frac{a}{b} dm \tag{7}$$

Using the KL divergence to measure forecast accuracy, some indicators are proposed:

- KL-N (quadratic loss function is scaled with the variance estimated):
- KL-N1 using the estimated variance only for the last five periods;
- KL-N2 takes into account only the last 10 periods in calculating the estimated variance;
- KL-DE1 based on a double exponential distribution of the error;
- KL-DE2, unlike the KL-DE1 use another estimator for the scale parameter.

Other measures to used to evaluate the accuracy are correlation between forecasted values and actual values (measured by coefficient of determination of changes in the series of values and the ones in forecasted series), the percentage of turning points forecast, calculated for binary variables by rank (score) Kuiper, conditional efficiency (for comparing two different forecasts based on the same regression model).

Recent studies target accuracy analysis using as comparison criterion different models used in making predictions or the analysis of forecasted values for the same macroeconomic indicators registered in several countries.

Ericsson NR (1992) shows that the parameters stability and mean square error of prediction are two key measures in evaluation of forecast accuracy, but they are not sufficient and it is necessary the introduction of a new statistical test.

Considering the AR (1) process, which is represented as $y_t = \beta y_{t-1} + u_t$, Hoque A., Magnus JR and Pesaran B. show that for small values of β the prediction mean square error is a decreasing function in comparison with the number of forecast periods.

Granger CWJ şi Jeon Y. CWJ Granger and Y. Jeon (2003) consider four models for U.S. inflation: an univariate model, a model based on an indicator used to measure inflation, an univariate model based on the two previous models and a bivariate model. Applying the

mean square error criterion, the best prediction made is the one based on an autoregressive model of order 1 (AR (1)). Applying distance-time method, the best model is the one based on an indicator used to measure the inflation.

Ledolter J. (2006) compares the mean square error of ex-post and ex ante forecasts of regression models with transfer function with the mean square error of univariate models that ignore the covariance and show superiority of predictions based on transfer functions.

T. Teräsvirta, van Dijk D., Medeiros MC (2005) examine the accuracy of forecasts based on linear autoregressive models, autoregressive with smooth transition (STAR) and neural networks (neural network-NN) time series for 47 months of the macroeconomic variables of G7 economies. For each model is used a dynamic specification and it is showed that STAR models generate better forecasts than linear autoregressive ones. Neural networks over long horizon forecast generated better predictions than the models using an approach from private to general.

U. Heilemann and Stekler H. (2007) explain why macroeconomic forecast accuracy in the last 50 years in G7 has not improved. The first explanation refers to the critic brought to macroeconometrics models and to forecasting models, and the second one is related to the unrealistic expectations of forecast accuracy. Problems related to the forecasts bias, data quality, the forecast process, predicted indicators, the relationship between forecast accuracy and forecast horizon are analyzed.

Ruth K. (2008), using the empirical studies, obtained forecasts with a higher degree of accuracy for European macroeconomic variables by combining specific sub-groups predictions in comparison with forecasts based on a single model for the whole Union.

Gorr WL (2009) showed that the univariate method of prediction is suitable for normal conditions of forecasting while using conventional measures for accuracy, but multivariate models are recommended for predicting exceptional conditions when ROC curve is used to measure accuracy.

Dovern J. and J. Weisser (2011) used a broad set of individual forecasts to analyze four macroeconomic variables in G7 countries. Analyzing accuracy, bias and forecasts efficiency, resulted large discrepancies between countries and also in the the same country for different variables. In general, the forecasts are biased and only a fraction of GDP forecasts are closer to the results registered in reality.

In Netherlands, experts make predictions starting from the macroeconomic model used by the Netherlands Bureau for Economic Policy Analysis (CPB). For the period 1997-2008 was reconstructed the model of the experts macroeconomic variables evolution and it was compared with the base model. The conclusions of Franses PH, Kranendonk HC and Lanser D. (2011) were that the CPB model forecasts are in general biased and with a higher degree of accuracy.

Many studies in literature refer to the combining of two methods based on the same model (such as eg bayesian mediation model), but French and Insura point out that a combination between model predictions and expert assessments has not been proposed yet.

III. EVALUATION OF MACROECONOMIC FORECASTS ACCURACY IN ROMANIA

In this study we evaluate the accuracy of forecasts made by principal institutions in Romania for inflation rate and unemployment rate: Institute of Economic Forecastingand NationalCommission ofForecasting

We consider the values of inflation and the unemployment rate projected by NationalCommission ofForecasting for the period 2004-2010. The indicators mentioned above are calculated for the forecast errors. The values of ME show the underestimation tendency of inflation. Moreover, MAE has the same value, showing the persistence of this underestimation.

The result is confirmed by practice, taking into account the shocks recorded in this period. Thus, in 2004, currency appreciation, the restrictiveness of fiscal policy and greater tendency towards savings have contributed to the disinflation process. However, a number of other factors determined the increase of inflationary pressure: the gross average wage growth, the accumulation of arrears and the increase of consumption. Disinflation process was resumed in 2005 due to weaker dynamics of administered prices and currency appreciation against the euro. A further acceleration of the disinflation process registered in 2006 due to volatile price downturn, the reducing of the basic component and the increased competition in the retail market.

But in 2007, the inflation trajectory changed, the annual inflation increase being attributed shocks like: unexpected increase of volatile prices for agricultural products, increase to food prices, the RON exchange rate correction, all of these in the context of an excessive demand. If the first half of 2008 inflationary pressures were generated by supply shocks (food market tensions, the rise in import prices of agricultural raw materials and unprocessed products) and demand shocks (increase in fuel prices and natural gas). Since August 2008 these factors have started to downsize, but influences on the demand generated by easy fiscal policy persisted, the maintenance of laxity in wage policy, expansion of lending. Amid a severe economic contraction in 2009 in Romania, a relatively slow rate of reduction in inflation was caused by persistent structural rigidities in the labor market and product market, but also by a variable number of factors acting during the year. In 2010, the volatile prices of food supply have been affected by the influence of external price increases in food goods, because of global supply reduction.

TABLE 1 - Values for inflation rate in Romania in 2004-2010

	Inflation rate (%)			
Year	INS	NationalCommission ofForecasting	Institute of Economic Forecasting (Dobrescu model)	Institute of Economic Forecasting (PEP program)
2004	11,9	9	6,2	12
2005	9	7	13,74	9
2006	6,56	4	6,88	7
2007	4,84	4,5	6,82	5
2008	7,85	3,8	5,88	3,6
2009	5,59	4,5	4,36	
2010	6,09	3,5	4,04	

SOURCE: Author

National Institute of Statistics - www.insse.ro, NationalCommission ofForecasting- www.cnp.ro, Dobrescu E. (2006), Macromodels of the Romanian Transition Economy, Expert Publishing house, Bucharest

ME indicator shows an underestimation of the annual inflation rate to 0.29 percentage points. The very low RMSE value indicates a low variability of the series of errors.

TABLE 2—The average and standard deviation of the inflation rate, respectively unemployment rate in 2004-2010

Statistical indicators	Inflation Rate (%)	Unemployment rate (%)
Average (2004-2010)	7,38	5,82
Standard deviation	2,62	1,27

SOURCE : own calculations using Excel

TABLE 3— Indicators of forecast accuracy for inflation and unemployment rate in Romania (2004-2010)

Forecast Errors	Inflation rate	Unemployment rate
RMSE*	0,1	0,09
ME*	0,29	-0,05
MAE*	0,29	0,27
MASE*	0,041	0,038
Stat. U Theil	0,33**	0,14***

* Percentage points
** Compared to Dobrescu model
*** Compared to the MA (1) model- dynamic forecast

SOURCE: Author

Unlike the forecast inflation rate, the negative ME value indicates an overestimation of the unemployment rate by 0.05 percentage points. Errors variability is very small, because RMSE has a value of only 0.09 percentage points. Labor market immediately reacted to the crisis in 2009 through higher unemployment, but also slower annual growth in wages.

For inflation, which recorded only positive rates of growth in the analyzed period, naive model have to extrapolate the latest trend. If Moore had proposed the comparison to projections based on an extrapolation method, the development of VAR and ARIMA models, impose their use as benchmark models. A value of U less than one indicates lower forecast errors than those from the naïve model. The same conclusion is reached when it is calculated the scale error proposed by Hyndman and Koehler.

The U statistic was calculated, taking as reference the inflation forecasts based on Dobrescu model and those of unemployment rate based on an MA (1) model.

Unemployment rates from 1991 to 2010 in Romania follow a MA(1) process: $r\_unemployment = 7{,}761 + e_t - 0{,}805 \cdot e_{t-1}$. We used two forecasting techniques: ex-post (corresponding the dynamic forecast) and ex-ante forecasts used for static forecast.

is the one thatforecasts the value in period only based on data up to time then, for all periods that are already projected using data from period makes forecasts based only on registered data.

A dynamic forecasting was made in EViews in 2004-2010. The ex- post technique was applied first, using the first 13 values of the unemployment rate for the model and the rest for prediction. Ex-ante technique of forecasting is based on all values.

Eviews Program displays a set of indicators to evaluate the model reliability:

- RMSE (Root Mean Squared Error), which must have a small value as possible;
- MAE (Mean Absolute Error);
- MAPE (Mean Absolute Percent Error);
- Theil's inequality coefficient (takes values in (0,1), a value close to 0 indicating a good adjustment; in this case has a low value, so, the adjustment is very good);
- Bias Proportion has to be small (in this case is quite large);
- Variance Proportion has to be as small; in this case is rather close to 0;
- Covariance Proportion is desirable to be as large as possible; in this case is very small.

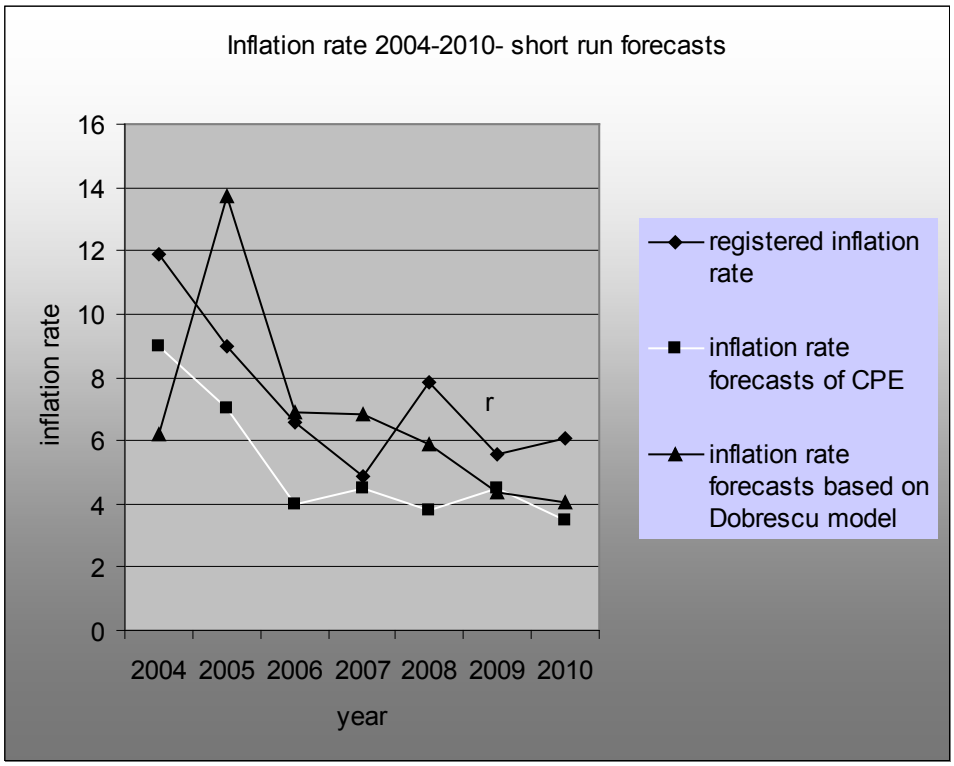
Inflation forecast errors of Dobrescu model are higher than those of the Commission of Forecasting. This conclusion was also reached by comparing RMSE and the Theil's U coefficient modified by changing the benchmark model.

RMSE for forecasted inflation rate of Dobrescu model is 1.03 percentage points compared to 0.29 percentage points, the value calculated for the Commission of Forecasting predictions.

Taking as reference the Dobrescu model forecast inflation rate the U statistics has a value of 0.33, which means that the Commission's forecasts are better. This conclusion is also results from the graphic analysis below.

SHORT RUN FORECASTS FOR THE INFLATION RATE (2004-2010)

FIGURE 1



SOURCE: Table 1

To make a comparison of forecasts characteristics, the loss-function values are analyzed-root mean squared error (RMSE), which calculates the forecast deviation from the actual values recorded. It is estimated that a prediction is much closer to the real evolution as much as RMSE value is lower. Static forecast is superior to the dynamic one for unemployment rate which follows a MA (1), because of the lower value of RMSE.

TABLE 4— Unemployment rate in Romania in 2004-2010

	Unemployment rate (%)				
Year	NationalCommission ofForecasting	Static Forecast MA (1)	Dynamic Forecast MA(1)	Institute of Economic Forecasting (Dobrescu model)	Institute of Economic Forecasting (PEP program)
2004	6,3	7,5599876	7,756	8,02	8
2005	5,9	6,7465086	7,761	7,9	7,9
2006	4	7,0794254	7,761	7,65	7,8
2007	4,4	5,2815697	7,761	7,42	7,6
2008	5,8	7,0511957	7,761	7,19	7,4
2009	7,5	6,7535875	7,761	6,99	
2010	6,9	8,3619821	7,761	6,83	

SOURCE: National Commission ofForecasting - www.cnp.ro, Dobrescu E. (2006), Macromodels of the Romanian Transition Economy, Expert Publishing House, Bucharest

Commission of Forecasting makes predictions using quarterly model of Romanian economy. On long run and short run, index of prices used to calculate inflation is estimated according to the index of M2 and the exchange rate.

RMSE for unemployment rate forecasts of Commission of Forecasting (1,27) is lower than the one of MA(1) model, which has the value 2,24 for a dynamic forecast in EViews.

EViews static forecast is better than the dynamic one taking into consideration all indicators used in reliability evaluation, but the RMSE is higher for predicted values of Commission of Forecasting. The modified U statistic is calculated in order to compare forecasts of the Commission with those based on the MA (1) model and a value of 0.07 resulted when static forecast is chosen as 'benchmark forecast' and 0.14 for a dynamic forecast used as reference forecast. In conclusion, we obtained smaller forecast errors for the unemployment rate provided by the Commission of Forecasting in comparison with the errors resulting from a moving average model.

E. Dobrescu (2003) groups the constraints affecting economic performance in two categories, one of these taking into account demand factors (limited access to foreign markets and the decline in real terms of capacity absorption) and the other one the supply factors (the activity of companies lacking performance). For the period 2003-2007, the academician Dobrescu has developed some scenarios of the evolution of main macroeconomic indicators, the workings being made in PEP program (Pre-Accession Economic Program).

For the period 2004-2010 the unemployment rate projected in the Dobrescu model achieved a RMSE value of 0.46. That means an error greater than the one of the forecast of Commission of forecasting. IPE also used the PEP program (Pre-Accesion Economic Programme) to forecast the unemployment rates from 200 to 2008. RMSE has a value of about 0.58, higher than 0.54, the result when Dobrescu model is used.

An optimal macroeconomic forecast is unbiased and efficient, in the macroeconomic

framework taking into account the rational expectations hypothesis. This implies a zero average prediction error.

IV. BIAS AND EFFICIENCY OF FORECASTS

Bias and forecast efficiency have an important role in the literature that examines the problem of forecast performance.

A. Bias forecasts

Corderie (2003) shows that McNees (1978, 1987) and Fair and Schiller (1989) brought among the first contributions in the field of bias and efficiency of the individual forecasts made by consensus. Figlewski and Wachtel noted that early results showed that the projections of private sector are biased and uncorrelated with the rational expectations hypothesis. Batchelor R. (2007) detected the presence of systematic bias in the forecast of real GDP and inflation made by the private sector in the G7 countries during 1990-2005. The measuring and test of bias was based on regression models and nonparametric tests of accuracy of the ranks. Empirical researches have shown a conclusion already presented in the literature, namely, the discrepancy between rational expectations tests and the too pessimistic or too optimistic forecasts.

Bias in this context implies a zero mean forecast error series. In the literature rationality tests are used to check if the forecasts are optimal in relation to a certain criterion, eg, if they are biased or ensure a good informational efficiency. The standard test of forecast bias-test-Mincer-Zarnowitz starts from this model : $A_t = a + b \cdot P_t + e_t$.

A_t -Current values, P_t – predicted values

We test Test the hypothesis of unbiased forecasts: a = 0, b = 1 using a F test, called Mincer-Zarnowitz test.

Holden and Peel proposed a modified version of the test, which is based on forecast errors by testing whether their mean (m) is zero: $A_t - P_t = m + e_t$.

In the first version of the test for the inflation rate resulted that a and b are not significantly different from 0, so the null hypothesis can not be accepted for the forecast made by the Commission of Forecasting. In the second version of the test was properly calculated a p-value of 0.003 for t test, which is lower than the threshold of 0.05. So, with a probability of 95% hypothesis of unbiasedness is rejected. The result is correct, since all expected values were lower than those actually recorded.

The bias of forecasts can be generated by technological shocks, which might be an important factor of economic growth. Wojciech C. and Svetlana M. (2009) realized an empirical research, breaking down inflation into a linear and a nonlinear component resulting from technological shocks, for which were they demonstrate the positive contribution to economic growth.

Accuracy can be improved if it is known that there is autocorrelation between errors and other data available at the time the forecast is made. The correlation indicates an inefficient

use of information from the past. If X_i are the observed variables that influence the forecast, then: $e_Y(t-k,k) = \gamma + \sum_i \sum_{j>k} \delta_{i,j} X_i(t-j) + e_t$.

If γ *and* $\delta_{i,j}$ are significantly different from zero, the forecasts can be improved if one takes into account the influence of X_i variables. However, Jeong and Maddie have demonstrated that tests of rationality are dependent on assumptions made for regression models. Pain shows that while the data series is nonstationar with unit roots, cointegration tests should be used. In the case of asymmetric loss functions the forecasts are rational, even if the mean error is zero.

Given the shocks in food prices during the chosen period, we check that only a part of the bias was caused precisely by the components of the index of consumer prices of goods used to calculate the inflation. Thus, we calculate a new inflation rate excluding food prices and we use this indicator in the regression model for testing the bias. Using an F test a lower bias than the initial one resulted. So, shocks in the price of food influence inflation forecasts.

B. Forecasts efficiency

Fair and Schiller (1989) propose a test in order to compare the efficiency of two forecasts made by two different institutions for the same variable. To this end, they consider a simple linear regression model: $X_t - X_{t-1} = b_0 + b_1(X_1^p - X_{t-1}) + b_2(X_2^p - X_{t-1})$

X_t - The value recorded for variable X at time t

X_{t-1} - The value recorded at time t-1 for variable X

X_1^p - The predicted value of the first institution

X_2^p - The predicted value of the second institution

If b1> 0 and b2 = 0, the second institution provides a forecast relatively inefficient, and the first institution forecast contains, in addition to the first one information, an essential piece of information about changes that may occur in the analyzed variable.

If b2> 0 and b1 = 0, the first institution provides a relatively inefficient forecast.

If both parameters of the regression model are strictly positive, then, each institution brings different information through the forecast.

We compared in terms of efficiency the inflation rate forecasts of Commission of Forecasting and Institute of Economic Forecasting for 2004-2010. After the estimation of model parameters, it resulted that b1 = 0.06, value that does not differ statistically to 0, and for b2a value of 1.538 b2> 0. Therefore, the Commission for Forecasting prediction is inefficient compared with that of the Institute of Economic Forecasting.

V. BUILDING FORECASTS INTERVALS

The problem of building forecast intervals and the determination of distributions was approached quite late in the literature, notable works in this area being written by Cogley (2005), Adolfson (2007), Clark (2009) and Jore (2009), Giordani and Villiani (2009). The results showed an important conclusion: in order to build a forecast interval with a certain probability, the model has to include variances deviation in time.

Kjellberg D. and M. Villani (2010) numbered the advantages and disadvantages of both types of forecasts, the ones based on models and those built by the experts. Forecast methods based on models describe the complex relationships using endogenous variables by its transparence making easy the identification of mistakes that generated wrong predictions. The disadvantages are related to the difficulty of adapting the model to recent changes in the economy, as well as the too simple form of the models. Chatfield shows that forecast intervals are often too narrow not taking into account the uncertainty related to model specification, problem that is encountered also in the experts' assessment. Unlike the forecasts based exclusive on models, expert assessments modify immediately to any change of information related to the predicted phenomenon. Disadvantages in experts assessments are related just to the low degree of transparency, the difficulty of using many explanatory variables outside an explicit model.

A. Building prediction intervals based on historical forecast errors

The build of intervals taking into account the forecasts accuracy is an effective way to highlight the uncertainty that accompanies any forecast made. In following, we used historical forecast errors to determine the forecast interval for inflation. We also used the projected inflation rates at the end of the year published by the National Bank of Romania for each quarter from 2007 to2010. Forecast errors are calculated as the difference between expected value and the registered value. Forecast errors for each quarter are calculated by RMSE.

Forecast intervals are built considering that the forecast error series is normally distributed of zero mean and standard deviation equal to the RMSE corresponding to historical forecast errors. For a probability of (1-α), forecast interval is calculated:

$$(X_t(k) - z_{\alpha/2} \cdot RMSE(k), X_t(k) + z_{\alpha/2} \cdot RMSE(k)), k = 1,...,K$$

$X_t(k)$- punctual forecast for variable X_{t+k} at time t

$z_{\alpha/2}$- the α / 2 quintile of standardized normal distribution.

The table below displays the RMSE and lower and upper limits of the forecast interval for inflation predicted by the central bank with a quarter before ('one-step-ahead ").

TABLE 5— The limits of the inflation rate forecast intervals in Romania from 2007 Q1 to 2010 Q4 (based on historical forecast errors)

Quarter	RMSE	Lower limit	Upper limit
2007 T1	0,67	3,18	5,82
2007 T2	0,51	3,31	5,29
2007 T3	0,19	4,42	5,18
2007 T4	1,99	0,79	8,61
2008 T1	1,65	3,06	9,54
2008 T2	2,36	1,57	10,83
2008 T3	2,72	0,07	10,73
2008 T4	2,51	-0,62	9,22
2009 T1	0,77	4,49	7,51
2009 T2	0,59	4,35	6,65
2009 T3	0,11	4,88	5,32
2009 T4	0,06	4,38	4,62
2010 T1	0,43	3,35	5,05
2010 T2	0,02	4,34	4,41
2010 T3	0,27	7,24	8,30
2010 T4	0,31	7,56	8,78

SOURCE: calculations made using data from reports of inflation of National Bank of Romania between 2006-2010 - www.bnr.ro

The forecast intervals based on RMSE are independent of the state of the economy. Therefore, Blix and Sellin proposed the change of the method, so that the interval takes into account of changes in the economy, multiplying RMSE by a factor of uncertainty subjective chosen by the expert in forecasting. Another approach uses, for the series of observations, a model in which time varies. The series of quarterly inflation rates follows an autoregressive AR process in which the series has a residual variance of stochastic type. It is assumed the hypothesis that errors are identically distributed and follows a standardized normal distribution. Then, the regression model can be written:

$ri = m + \sum_{k=1}^{K} \varphi_k (ri_{t-k} - m) + \alpha_t \cdot e_t$, where α_t is the standard deviation of errors $\ln\alpha_t^2 = \ln\alpha_{t-1}^2 + \varepsilon_t$, where ε_t follows a normal distribution and $\ln\alpha_t^2$ is a random walk
We introduce a new statistical measure called the relative volatility or relative variance (variance of T moment in relation with the geometric mean of variances corresponding to the

interval used to calculate RMSE), calculated by the formula: $\beta_T = \frac{\hat{\alpha}_T}{n^{-1}\prod_{t=t_1}^{t_2}\hat{\alpha}_t^{\frac{1}{n}}}$ t_1 and t_2 are the

initial moment and the final one of the period for which RMSE is calculated, the time of the interval bounded of the two moments is: $n = t_1 + t_2 - 1$, and $\hat{\alpha}_T$ is a bayesian estimation. The new intervals of variation of forecast values will be calculated as follows:

$(X_t(k) - z_{\alpha/2} \cdot \alpha_t \cdot RMSE(k), X_t(k) + z_{\alpha/2} \cdot \alpha_t \cdot RMSE(k)), k = 1,...,K \cdot$

The relative volatility is 0,279.

Relative volatility of Q4 of 2010 was 1.279, which means that a 62.1% decrease in the value of RMSE is necessary to take into account the changes in the economy.

B. The proposal of a new way to build forecast interval for Romania

Between 2007-2010 inflation rates calculated at the end of the quarter may be represented by an AR process of order 1 (AR (1)). To determine the interval of variances of BNR predictions taking into account the state of the economy in each of the periods for which data were recorded, the coefficient which multiplies RMSE is calculated in different way than that recommended in the literature. Inflation is modeled in 2007-2010 as:

$r\_\inf_t = 6,917 + 0,714 \cdot r\_\inf_{t-1} + e_t$

For an AR process ($X_t = \phi_1 \cdot X_{t-1} + e_t$), the variance is: $\text{var}(X_t) = \frac{\sigma_e^2}{1+\phi_1^2}$, where

σ_e^2 – AR error variance.

The variance of inflation is: $\text{var}(r\_\inf) = \frac{\sigma_e^2}{1+0,714^2} = \frac{1,232}{1,509} = 0,816$

We introduce as a measure of economic state the indicator δ -relative variance of the phenomenon at a specific time in relation with the variance on the entire time horizon, which for T moment is calculated as: $\delta_T = \frac{[e_T - E(e_t)]^2}{\text{var}(r\_\inf)} = 0,339$

TABLE 6—The limits of the inflation rate forecast intervals in Romania from 2007 Q1 to 2010 Q4 (based on own method)

Quarter	e_t	$[e_t - E(e_t)]^2$	δ_t	RMSE	Lower limit	Upper limit
2007 T2	-0,921	0,849	1,040	0,507	3,267	5,333
2007 T3	0,307	0,094	0,116	0,193	4,756	4,844
2007 T4	1,149	1,320	1,618	1,993	-1,621	11,021
2008 T1	1,195	1,428	1,750	1,653	0,629	11,971
2008 T2	0,905	0,819	1,003	2,363	1,552	10,848
2008 T3	0,029	0,001	0,001	2,720	5,394	5,406
2008 T4	-0,967	0,934	1,145	2,510	-1,333	9,933
2009 T1	-0,071	0,005	0,006	0,770	5,991	6,009
2009 T2	-0,722	0,521	0,639	0,587	4,765	6,235
2009 T3	-1,336	1,785	2,188	0,113	4,614	5,586
2009 T4	-0,980	0,961	1,177	0,063	4,354	4,646
2010 T1	-0,603	0,364	0,445	0,434	3,817	4,575
2010 T2	-0,923	0,852	1,044	0,017	4,342	4,412
2010 T3	2,410	5,808	7,118	0,270	3,999	11,535
2010 T4	0,526	0,277	0,340	0,311	7,960	8,374

SOURCE: calculations made using data from reports of inflation of National Bank of Romania between 2006-2010 - www.bnr.ro

In this case, we obtained a relatively large variance, which means that it is necessary a decrease of RMSE value with 66.1% if one takes into the state of the economy in the last quarter of 2010.

VI. CONCLUSIONS

Forecast performance evaluation is an important indicator of the extent to which projections made accomplished their purpose to be closer as much as possible of the registered values. Forecasts accuracy in Romania for inflation and unemployment rate was evaluated for each an institution specialized in the elaboration of forecasts, and comparisons were made showing the superiority of forecasts made by National Commission of Forecasting. However, in terms of efficiency, Institute of Economic Forecasting inflation provides better predictions. Regardless of the institution, all forecasts are biased, an important part of this bias being caused by shocks in the food prices in 2004-2010.

Based on data of inflation forecasts provided quarterly by the Central Bank, forecast intervals were built using the method of historical forecast errors. For Romania, when inflation rates follows an AR (1), we have improved the technique of building forecast intervals taking into account the state of the economy in each period for which data were recorded.

In conclusion, macroeconomic forecasts evaluation is necessary to inform the public about the way in which state institutions predicted the economic phenomenon. Further,

according a certain degree of reliability by studying the results, in the future the public attention will focus on a particular institution in accord with the criterion followed, accuracy or efficiency, whereas the forecasts are generally biased at national and internationally level because of the difficulty to anticipate the structural shocks.

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SMANJENJE NEODLUČNOSTI PRI DONOŠENJU ODLUKA VREDNOVANJEM UČINKA MAKROEKONOMSKIH PREDVIĐANJA U RUMUNJSKOJ

Sažetak

Vrednovanje performansi makroekonomskih predviđanja ne uključuje samo izračun nekoliko statističkih mjera, prilično kontroverznih u literaturi, kao što su korijen srednje kvadratne greške ili srednje apsolutne greške. U teoriji i ekonomskoj praksi, možemo pratiti tri smjera u vezi s vrednovanjem performansi predviđanja: analizu točnosti, pristranosti i efikasnosti. Koristeći prognozirane srednje vrijednosti stope inflacije i stope nezaposlenosti u periodu od 2004. do 2010. u Rumunjskoj, dobivamo bolji stupanj točnosti i manju efikasnost za prognoze koje daje Nacionalna komisija za prognoziranje u usporedbi s onima baziranim na Dobrescu modelu kojeg koristi Institut za ekonomska prognoziranja. Slijedeći međunarodni trend, predviđanja su u svakom slučaju pristrana radi poteškoća u preciznom predviđanju šokova koji utječu na ekonomiju. Performansa predviđanja je neraskidivo vezana za njihovu nesigurnost, RMSE, mjeru vrednovanja točnosti koju koristimo u stvaranju prognostičkih intervala zasnovanih na povijesnim pogreškama. Za predložene vrijednosti stope inflacije koje objavljuje Rumunjska Narodna Banka, predlažemo nov način kreiranja prognostičkog intervala kako bi se uzeli u obzir ekonomski šokovi.

Ključne riječi: *makroekonomsko predviđanje, točnost, pristranost, učinkovitost*

THE DYNAMICAL RELATIONSHIP BETWEEN OIL PRICE SHOCKS AND SELECTED MACROECONOMIC VARIABLES IN TURKEY

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ABSTRACT

In many empirical studies, the dynamic relationship among energy sector variables (such as, oil, electricity, gasoline, coal, renewable energy, etc.) and economic variables (such as; financial markets, real economy and the overall economy) are studied. Oil price changes may affect the economic variables more of oil importer countries then oil exporter countries especially emerging markets. In addition to this, oil price changes and shocks may be an important device to explain stock market index return. In this paper, Istanbul stock exchange market index (ISE-100), interest rates, exchange rates and oil price are analyzed by using a vector autoregressive (VAR) approach for Turkey. The results suggest that there is a dynamic relationship among oil price shocks, Istanbul stock market index, exchange rate and interest rate.

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I. INTRODUCTION

Oil is the lifeblood of modern economics (Basher and Sadorsky, 2006). When countries urbanize and modernize, demand for oil increases. The forecasting of oil demand for the future is not easy but it can be said that the demand for oil and the industrial development are highly correlated. As the growth rate increases, the demand for energy (especially oil, electricity, renewable energy, etc.,) increases. In the future, most probably China and India (these countries are called emerging economies which are growing very fast according to other emerging countries) are expected to demand and consume the most of the world's oil production (Basher and Sadorsky, 2006). Therefore, the price changes of oil or energy affect emerging economies more than developed economies. The production technologies which based on oil are very dangerous for air pollution and environment. Because of this reason, most developed countries shift their production lines from oil based technology to other types of alternative technologies or they carry their productions to developing or under-developing countries. Thus, emerging economies tend to be more energy intensive than developed economies.

The simple demand and supply rule is valid for the oil prices. If there is a demand surplus for oil, this leads to higher oil prices. According to Basher and Sadorsky (2006) if oil price increases, this will act same as the inflation tax and two things can happen (1) consumers try to find alternative energies, and (2) increasing in the production cost of the non-oil producing companies; oil price volatility increases the risk and uncertainty which negatively affect the stock prices and reduces wealth and investment. Basher and Sadorsky (2006) used a multi-factor model to investigate the relationship between oil price risk and emerging stock market returns. They found strong evidence that oil price risk impacts the stock price returns in emerging markets.

There are many studies on the relationship among oil prices, the stock prices, and real economic activities. However, most of these studies have focused on the stock markets of the developed economies (Sadorsky (1999); Cunado and DeGracia (2005); Lanza et.al, (2005); Basher and Sadorsky (2006); Ghouri (2006); Lardic and Mignon (2008); Henriques and Sadorsky (2008); Park and Ratti (2008); Faff and Brailsford (1999)). Only a few studies concentrated on emerging economies' financial markets (e.g. Papapetrou (2001); Rautava (2004); Hammoudeh and Choi (2006); Farzanegan and Markwardt (2009); Basher, Haug and Sadorsky (2010), Soytaş, et. al., (2009)). The aim of the present study is to investigate the dynamic relationship among oil price, stock market index, interest rate, and exchange rate in Turkey. The rest of the paper is organized as follows: In the second section, a review of empirical studies on the effects of oil prices on macro-economical variables will provided. Afterwards, impulse response functions and variance decomposition analysis results will be presented and discussed.

II. LITERATURE

The effect of crude oil prices on the macro-economical variables has been the subject of many studies. While the most of these studies are concerned with the developed economies, a number of studies dealing with the effect on the emerging markets are also present. Oil price changes and shocks affect real economic activity in several ways (Lardic and Mignon, 2006; Cunado and DeGracia, 2005; Abeysinghe, 2001). One of the effects is the classical supply side effect. An increase in oil prices leads to an increase in the cost of production which in turn causes a decrease in growth of output and productivity. An increase in oil prices impacts trade of oil importer countries negatively. Another effect is about money demand. As oil prices increases, the amount of money demanded also increases. If the government does not give strong reaction to this increase, the inflation rate of the country can rise, investments may decrease and at the end total gross domestic product may decline. The nominal wages may rise while real wages decreasing as a result of an increase in oil prices which leads economy to the price-wage loops. Besides that, in short-term, oil prices may affect the production structure and in turn have negative effect on unemployment but in the long run the increase in oil prices will induce structural changes for the energy sectors.

Cunado and DeGracia (2005) studied the oil prices and macro economy relationships to shed a light on the impact of oil price shocks on both economic activity and consumer price indices in six Asian countries (Malaysia, Japan, Singapore, South Korea, Philippines, and Thailand). They found two important results. First, oil prices have a significant effect on economic activity and price indices, and second, this effect is more significant when oil price shocks are defined in local prices.

Cheung and Ng (1998) have studied the long run co-movements among five national stock market indices (Canada, Germany, Italy, Japan, and USA) and measures of aggregate real activity including the real oil price, real consumption, real money and real output by using Johanson co-integration. They found that oil prices are negatively correlated with stock prices. According to Cheung and Ng (1998) increases in oil prices generally cause a rise in the production cost which leads to a fall in the aggregate economic activity.

Papapetrou (2001) studied to explain the dynamic relationship among oil price changes, real sector prices, interest rates, real economic activity and employment for Greece. He used both industrial production and employment as the measure of economic activity and found that the oil price shocks have negative effect on industrial production and employment. The results, also, suggest that a steep increase in oil price depresses the real stock returns.

In addition to its effects on the real economic activity and employment oil price changes are very important tools to explain stock price movements. According to Cong et.al., (2008) oil price shocks are not the only factor that affects the stock market prices. Oil price shocks have influences on industries' stock price differently. The relationship between oil price and stock market is complicated and it is not easy to explain for many countries. Cong at. al. (2008) investigated the interactive relationship between oil price shocks and Chinese stock market using multivariate vector auto-regression methodology. They found that oil price shocks have statistically significant effects only on the manufacturing index and some oil companies' stock prices. Some important oil price shocks depressed the oil company stock price in China. To explain the changes in the return of manufacturing index, both world and Chinese oil

price shocks were found to be better explanation tools more compared to the interest rates. Sadorsky (1999) tried to explain the oil price and oil price volatility effects on real stock returns for USA. After 1986, oil prices explain a larger fraction of the forecast error variance in real stock returns compared to the interest rates. In addition to this, there is evidence that oil price volatility shocks have asymmetric effects on economy.

Henriques and Sadorsky (2008) used four variables vector autoregressive model to develop and estimate the empirical relationship between alternative energy stock prices, technological stock prices, oil prices and interest rates. They found Granger causality between technology stock prices and oil prices with the alternative energy companies' stock prices. Simulation results showed that a shock to technology stock prices has a larger impact on alternative energy stock prices than does a shock to oil prices.

According to Park and Ratti (2008), oil price shocks have a statistically significant impact on real stock returns contemporaneously. A multivariate VAR analysis is conducted with linear and nonlinear specification of oil price shocks in USA and 13 European countries[1]. Oil price shocks have a statistically significant impact on real stock returns in the same month or within one month. Authors stated that the stock market's response to oil price shock partly depend on whether the country was oil importing or oil exporting countries. Another study (Hammoudeh and Li, 2005) compared the relationship between oil price changes and stock returns for oil-based countries (Mexico and Norway) and oil-sensitive industries (US oil and transportation industries) by using vector error – correction model (VEC) and they also examined the oil sensitivity of those returns with their sensitivity to systematic risk with respect to the world capital market using international arbitrage pricing model (APT). Also, they tested whether or not asymmetry in return sensitivity exist when the world capital market is an up or down. Their findings showed that the oil price growth leads the stock returns of oil exporting countries and the US oil-sensitive industries and this industry showing the greatest sensitivity. According to Hammoudeh and Li (2005), the oil sensitivity is positive in the case of the US AMEX Oil Index and the Norway Oslo All-Shares index but negative for US transportation index, but the Oil sensitivity does not sensitivity for Mexico.

Hammoudeh and Aleisa (2004) investigated the links between the stock market indices of GCC[2] and NewYork Mercantile Exchange (NYMEX) oil futures prices for the period of 1994-2001. The results of the study revealed that Saudi Arabia has a predictive power for oil futures prices since there is a bidirectional relationship between stock market indices of Saudi Arabia and NYMEX future oil prices. Hammoudeh and Choi (2006) made a similar study to investigate the relationships among five GCC stock markets and their links to three global factors (Western Texas Intermediate (WTI) oil spot prices, US 3-months Treasury bill rate and S&P index) by using vector-error correction (VEC) model for the weekly data and they found that five GCC stock markets and three global variables have several long-run equilibrium relationships and are co-driven by common stochastic forces. In addition to this, they found that the US T-bill has a short term impact on some of the GCC stock markets.

Lanza, et.al (2005) focuses on the long run financial determinants of the stock prices of six major oil companies (BP, Chevron-Texaco, Eni, Exxon-Mobil, Royal Dutch Shell, Total-Fina-Elf). They used multivariate co-integration techniques and vector correction models,

[1] Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Netherlands, Norway, Spain, Sweden, U.K

[2] Members of Gulf Cooperation Council (GCC) includes Bahrain, Kuwait, Oman, Saudi Arabia and The United Arab Emirates

and found that the major financial variables are statistically significant in explaining the long-run dynamics of oil companies' stock values.

Rautava (2004) used vector autoregressive model and co-integration techniques to analyze the impact of international oil prices and real exchange rate on Russian economy and its fiscal policy. It is found that Russian economy and real exchange rate are influenced by oil price fluctuations in a statistically significant way.

Basher et al. (2010) examined the dynamic relationship between oil prices, exchange rates and emerging stock markets[3] using structural vector autoregression approach and they found that positive shocks to oil prices tend to depress emerging market stock prices and US dollars exchange rates in short run. Their results support that exchange rates respond to movements in oil prices and most of the dynamic relations takes place in short run. Also, they highlighted that oil prices respond negatively to an unexpected increase in oil supply and oil prices respond positively to an unexpected increase in demand and positive shocks to emerging stock markets.

Soytaş et al. (2009) examined the long and short-run relationships among the world oil price, Turkish interest rate, Turkish lira/US dollar exchange rate, and domestic spot gold and silver price by using Vector Autoregressive (VAR) model. They found that the world oil price has no predictive power of the precious metal prices, the interest rate and the exchange rate market in Turkey. Turkish spot precious metals, exchange rate and bond markets do not also provide information that would help improve the forecasts of world oil prices in the long run and there are no any significant influence of developments in the world oil markets on Turkish markets in the short run either.

As a summary of the above cited empirical researches, it can be said that there is an important relationship among the oil prices, macro economical variables and stock market index. In this paper, the main focus is to examine the relationship of oil price, macro-economical variables and stock market for Turkish market.

III. DATA AND METHODOLOGY

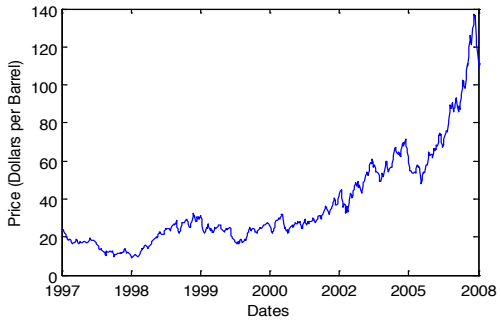
A. Data

The data used in the present study are crude oil price, exchange rate, interest rate and the main index of Istanbul Stock Market Exchange (ISE100) for the period 01.07.2005 – 10.31.2008. Oil price data are gathered from the American Energy Information Administration's web page (http://www.eia.doe.gov/), ISE100 data are collected from the web page of Istanbul Stock Exchange (http://www.ise.org/), and the interest and the exchange rates are collected from web page of Central Bank of the Republic of Turkey (http://www.tcmb.gov.tr/yeni/eng/). The empirical analysis has been carried out using weekly data. The variables of the model are Istanbul Stock Market index –*ISE100*, interest rate – *IR*, exchange rate – *ER*, and oil price – *OP*. The weekly World oil price (US Dollars per Barrel) is shown in Figure 1. The oil price has been increasing very sharply for last three years. The World oil price is all countries spot price FOB weighted by estimated export volume.

[3] Brazil, Chile, Colombia, Mexico, Peru, Czech Republic, Egypt, Hungary, Israel, Morocco, Poland, Russia, South Africa, Turkey, China, India, Indonesia, Korea, Malaysia, Philippines, Taiwan and Thailand

Weekly World Oil Price (US Dollars per Barrel)

FIGURE 1



SOURCE: Author

B. Methodology

The dynamical relationship among ISE100 changes, interest rate changes, exchange rate changes, and oil price changes are analyzed by the carrying out the following procedure. First, in order to determine whether the series are non-stationary in the levels and whether they are stationary in the first difference, one needs to perform a unit root test (Nandha and Hammoudeh, 2007). Co-integration test is necessary to see the co-integration equations after unit root test. Then, vector autoregressive (VAR) model or Vector Error Correct Method (VECM) can be applied. If the variables are stationary at level, VAR model can be applied. If the variables are non-stationary at the level, it must test for first difference for examining the stationary level. If the co-integration equations are statistically significant, the VECM might be used to analyze the long term relationship between variables with appropriate lag. Otherwise, VAR model can be used with the appropriate lag. VAR model applied, the impulse-response function analysis and variance decompositions could be done.

Unit root test

In order to avoid artificial regression results, it must be used as stationary state level. According to Rautava(2004), there are two reasons for unit root test and co-integration test. First, the risk of spurious correlation between variables and the second one is using only first differences of the variables runs the losing relevant information. Because of these reasons, unit root tests are necessary to see the variables are at stationary or non-stationary. If the variables are not stationary, co-integration test should be applied to understand the actual behavior of the variables. Augmented Dickey-Fuller (ADF), Phillips-Perron Test Equation (PP), Kwiatkowski-Phillips-Schmidt-Shin (KPSS), Elliott-Rothenberg-Stock (ERS), Ng-Perron (NP) are the methods to test unit root of variables.

Phillips-Perron (PP) unit root test was used to investigate whether the variables in this study are integrated in the same order or not. The null hypotheses of PP test for the interest rate,

exchange rate, stock market index and oil price is that log level of each variable has a unit root. The PP unit root test results are presented in Table1. According to results, the three variables *(Ln (ISE100), Ln(ER)*, and *Ln(IR)*) are non-stationary and the *Ln(OP)* variable is stationary at the significance level of 5% in level state with constant term. In levels and constant + trend position, just *Ln(IR)* is stationary at 5% significance level, *Ln(ER), Ln(OP)* and *Ln(ISE-100)* are non-stationary. In the first difference all of the variables are stationary at the 1% significance level for both constant and constant + trend position.

TABLE 1 - Results of Phillips-Perron Unit Root test (The null hypothesis is that the variable is non-stationary) ($y_t = \alpha + \beta y_{t-1} + u_t$)

	Variable	Constant – $Z(t_\alpha)$	Constant + trend – $Z(t_\alpha)$
In Levels	Ln(IR)	-1.11	-2.07**
	Ln(ER)	-0.67	0.06
	Ln(ISE-100)	-1.31	0.56
	Ln(OP)	-2.14**	-0.02
In the first difference	Ln(IR)	-13.99*	-14.01*
	Ln(ER)	-10.14*	-10.23*
	Ln(ISE-100)	-11.13*	-11.42*
	Ln(OP)	-9.62*	-9.77*

Notes: ** and * denote that a test statistic is statistically significant at the 5% and 1% level of significance, respectively. Unit root computations are made by using Eviews employing the Bartlett Kernel estimation method with Newey-West Bandwith selector. The null hypothesis of PP test is the series has a unit root.
SOURCE: Author

Co-integration Test

Table 2 presents the results of Johanson co-integration test. Johanson maximum likelihood approach was used to test cointegration and it employed both maximum Eigenvalue and trace statistics. According to Trace test statistics and Max-eigenvalue test, there is no cointegration at both 5% and 1% levels.

TABLE 2 - Johansen Cointegration Test results for the variables (OP, ISE100, ER, IR)

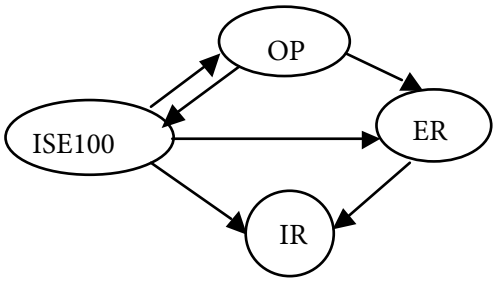
Hypothesized No. of CE(s)	Trace Statistic	5% Critical Value	1% Critical Value	Max-Eigen Statistic	5% Critical Value	1% Critical Value
None	44.89			21.60		
At most 1	23.29	29.68	35.65	12.38	20.97	25.52
At most 2	10.91	15.41	20.04	7.82	14.07	18.63
At most 3	3.09	3.76	6.65	3.09	3.76	6.65

Note: *(**) denotes rejection of the hypothesis at the 5%(1%) level
SOURCE: Author

IV. IMPULSE RESPONSE AND VARIANCE DECOMPOSITION ANALYSIS

In this study a VAR analysis was used to explain oil price changes and its effects on stock returns, interest rate changes and exchange rate changes. VAR analysis allows the analyzer to test for the endogeneity of all variables and the responses of oil price changes, stock returns, interest rates, and exchange rate to oil prices, exchange rate, interest rate and exchange rate shocks in order to capture the short-run dynamics of the variables. To construct the VAR vector, relationships among variables was examined with the Granger causalities test. Results of Granger causality test can be illustrated as follows;

FIGURE 2



SOURCE: Author

To determine the appropriate number of lag length of the VAR model the likelihood ratio statistic is employed which follows the chi-squared distribution. The results of this analysis are shown in Table 3. Five criteria (LR, FPE, AIC, SC, HQ) are used to select appropriate lag length of the VAR model. According to results, lag length is 1 based on three criteria (FPE, AIC and HQ).

Each equations of the VAR model are tested for the serial correlation with LM-statistics, and normality test. There was no serial correlations between variable but results rejected the normality. Since the Johanson procedure does not strictly depend on the normality assumption (Papapetrou, 2001), the VAR is employed for analysis.

Next, the generalized impulse response functions and the generalized variance decomposition are employed to analyze the short-run dynamics of the variables. The purpose of the analysis is to find each variable responds to one standard deviation shocks of other variables.

TABLE 3 - VAR Lag Order Selection Criteria

Endogenous variables: ***D(OP) D(ISE100) D(ER) D(IR)***

Lag	LogL	LR	FPE	AIC	SC	HQ
0	1738.649	NA	1.38E-13	-8.25946	-8.19110*	-18.23177
1	1778.387	77.38624	1.08E-13*	-8.50934*	-18.16755	-8.37089*
2	1793.548	28.88492	1.09E-13	-18.50051	-17.88528	-18.25129
3	1799.625	11.32314	1.21E-13	-18.39606	-17.50740	-18.03607
4	1808.281	15.76297	1.30E-13	-18.31875	-17.15666	-17.84800
5	1824.176	28.27650*	1.31E-13	-18.31765	-16.88212	-17.73614
6	1830.936	11.73991	1.44E-13	-18.22038	-16.51142	-17.52810
7	1840.210	15.71759	1.56E-13	-18.14958	-16.16719	-17.34654
8	1852.177	19.77637	1.63E-13	-18.10712	-15.85130	-17.19332

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

SOURCE: Author

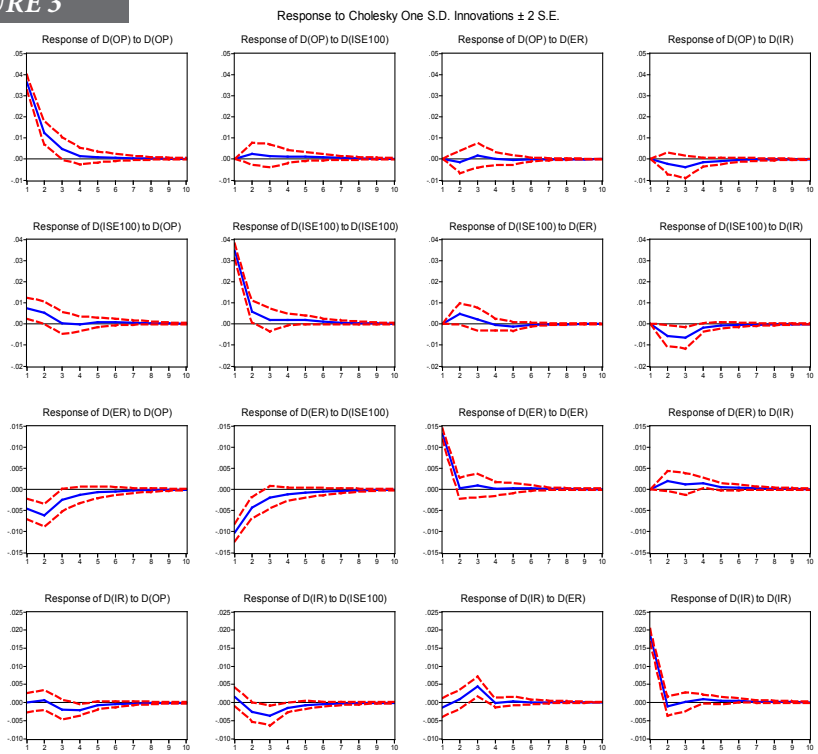
A. Impulse-Response Functions

Plotting the response to Cholesky one standard deviation functions is a practical way to explore the response of each variable to a shock immediately or with various lags. Figure 2 shows the impulse-responses results for one standard deviation of oil price, ISE100, exchange rate, and interest rate shock to oil price, ISE100, exchange rate, and interest rate disturbances. First column of figure 2 is belong to responses of variables to oil price changes, second column is for response of variables to ise100 index, third column is for responses of variables to exchange rate changes and the last column is for response of all variables to one standard deviation changes of interest rate changes. The impulse functions for oil price, ISE100, exchange rate, and interest rate are reported in rates. To see the percentage value, the rates must be multiplied by 100.

First column on figure 2 shows the responses of stock market index, exchange rate, interest rate and oil price to one standard deviation change on oil price shocks. Oil price shock has a positive impact on ISE100 and itself and negative impact on exchange rate. The impacts of oil price shocks on ise100 lost after third week. The impacts of oil price shocks on exchange rate and interest rate lost after seven week.

Impulse and response functions

FIGURE 3



SOURCE: Author

When we look at the second column in on Figure 2, it can be seen that ISE100 shock has a small positive impact on oil price and ISE100 but it has negative impact on exchange rate and interest rates. The exchange rate response is negative in the initial week after the shocks and then increases steadily up to eight week. Nine weeks after shock, the response of exchange rate lost its affects. Interest rate responses to ISE100 shock in the short run with the lowest response occurring third week, after the seventh week it lost its affects.

According to Dimitrova (2005), currency depreciation leads to a decline in stock prices in the short run. Exchange rate depreciation suggests higher inflation in the future and this makes investors doubtful about the companies' future performance. Therefore, stock prices drop in future. The expected thing is this "stock prices react exchange rates". According to author, when stock prices decline, foreign investors sell their financial assets and they buy respective currency. As a result, this leads to currency depreciation.

Third column of the figure 2 shows response of stock market index, exchange rates, interest rates and oil price to exchange rate shocks. Response of stock market index to one standard

deviation shock on exchange rate is positive effects for the first four weeks and it reached to the peak level at the second week, after seventh week it lost its affects. Response of interest rate to the exchange rate shock is negative at first week but positive between second and fourth week while the response of oil price is very small and lost its affects on oil price after seventh week.

In fourth column, figures show response of stock exchange market index, exchange rates, interest rates and oil price to interest rate shocks. Response of ise100 to one standard deviation shocks on interest rate is negative effect at the beginning and it reached to the lowest level at the third week. When the interest rate increases, at the beginning, investment can move from stock markets to money markets. But this is not stationary. After a while, the process returns back. According to Maysami et.al (2004) there is a negative relationship between interest rate and stock prices. There are two main reasons of this negative relationship. First, interest rate can influence the level of corporate profits which in turn influence the price investors are willing to pay for the stock through expectations of higher future dividends payments. Second, substantial amount of stocks are purchased with borrowing money, hence an increase in interest rates would make stock transactions more costly. According to Sadorsky (1999), changes in interest rates affect stock returns for three reasons. (a) Changes in interest rates are changes in the price charged for credit which is a major influence on the level of corporate profit. (b) Movements in interest rates change the relationship between competing financial assets. (c) Some stocks are purchased on margin. If the interest rate increases, stock returns will be dampened.

B. Variance Decomposition

Variance decomposition gives the proportion of the movements in the dependent variables that due to their own shocks, versus shocks to the other variables. Table .4 shows the variance decomposition for oil prices, ISE100, exchange rate, and interest rate over a period of 10 weeks. The reported numbers indicate the percentage of the forecast error in each variable. These errors can be attributed to innovations in other variables at four different time horizons (1, 4, 7, and 10 weeks).

TABLE 4 - Variance decomposition of oil price, ISE100, exchange rate, and interest rate

Variance Decomposition of Oil Price					
Period	S.E.	Oil Price shock	ISE100 shock	Exchange Rate shock	Interest Rate shock
1	0.036339	100.00	0.00	0.00	0.00
4	0.039193	97.64	0.60	0.32	1.44
7	0.039258	97.41	0.73	0.34	1.51
10	0.039262	97.40	0.74	0.34	1.52
Variance Decomposition of Istanbul Stock Exchange Market index (ISE100)					
Period	S.E.	D(OP)	D(ISE100)	D(ER)	D(IR)
1	0.03537	4.41	95.59	0.00	0.00
4	0.037759	5.83	86.70	1.83	5.65
7	0.037881	5.91	86.48	1.95	5.67
10	0.037887	5.92	86.46	1.95	5.68
Variance Decomposition of Exchange Rate					
Period	S.E.	D(OP)	D(ISE100)	D(ER)	D(IR)
1	0.01724	7.26	35.28	57.46	0.00
4	0.019393	18.10	34.30	45.63	1.96
7	0.019457	18.18	34.36	45.36	2.09
10	0.019462	18.19	34.37	45.34	2.10
Variance Decomposition of Interest Rate					
Period	S.E.	D(OP)	D(ISE100)	D(ER)	D(IR)
1	0.018588	0.00	0.70	0.55	98.74
4	0.019996	2.14	6.34	5.71	85.81
7	0.020055	2.37	6.50	5.70	85.43
10	0.020059	2.38	6.51	5.70	85.41

Cholesky Ordering: *D(OP) D(ISE100) D(ER) D(IR)*
SOURCE: Author

The results of variance decomposition suggest that each of the variables can be explained by the disturbances of others. As the table below suggests, the variance decomposition results are consistent with the findings of impulse-response functions. In the first week, 95.59% of the variability in Istanbul stock exchange market index changes is explained its own, 4.41% of the variability is explained by oil price shock. After 10 weeks, shocks to ise100, exchange rate, interest rate and oil price are approximately 86.46%, 1.95%, 5.68% and 5.92% subsequently.

According to the variance decomposition results for exchange rate, most of the exchange rate variability comes from itself and ise100. At the first week, 57.46% of the variability in exchange rate is explained by itself, while 35.28% is explained by ISE100, and 7.26% by oil price. After ten weeks, 45.34% is explained by the exchange rate, while 34.37% by ise100, 2.10% by interest rate and 18.19% by oil price changes. In the long term, the affects of oil price on exchange rate increase.

Table.4 represents that 98.74% of the variability of interest rate comes from itself while 0.70% by ISE100, and 0.55% by exchange rate changes. After seven weeks, ise100, exchange rate, interest rate and oil price account for 6.50%, 5.70%, 85.43%, and 2.37% of the interest rate forecast error variance, respectively.

Finally, table.4 presents the variance decomposition of oil price changes. In the first week, 100% of the oil price variability is attributed to shocks itself. After ten weeks, oil price variations (97.40%) are still mainly due to its changes, while 0.74% to ISE100, 0.34% to exchange rate and 1.52% interest rate.

V. CONCLUSION

The short term relationship between oil prices and interest rate, stock market index, and exchange rate was investigated for Turkish market in the period 07.01.2005 – 31.10.2008 by using a vector autoregressive (VAR) model. The main findings of the study are as follows: The oil price changes shocks have effect on Istanbul stock exchange market index which is similar to the findings of Cheung and Ng (1998) and Cong et.al (2008). The reason might be Turkey is an oil importing country and most of the companies on stock exchange market are affected directly or indirectly from oil price and exchange rate changes. Exchange rate changes influenced by the oil price which is similar to the findings of Rautava (2004). Oil price shocks explain a significant proportion of the Istanbul stock exchange market and interest rates and immediate negative effect on exchange rates. Impulse-Response functions results are also support variance decomposition results.

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DINAMIČKI ODNOS IZMEĐU NAFTNIH ŠOKOVA I ODABRANIH MAKROEKONOMSKIH VARIJABLI U TURSKOJ

SAŽETAK

Mnoga empirijska istraživanja proučavaju dinamički odnos između varijabli energetskog sektora (kao što su nafta, struja, benzin, ugljen, obnovljivi izvori, itd.) i ekonomskih varijabli (kao što su financijska tržišta, realna ekonomija i opća ekonomija). Promjene u cijeni nafte mogu više utjecati na ekonomske varijable u zemljama uvoznicama nafte nego u zemljama izvoznicama nafte, posebice na tržištima u nastajanju. Osim toga, promjene u cijeni nafte i naftni šokovi mogu biti važni pri objašnjavanju indeksa prinosa na tržištu dionica. Ovaj rad analizira indeks istambulskog tržišta dionica (ISE-100), kamatne stope, tečajne stope i cijenu nafte koristeći pristup vektorske autoregresije (VAR) za Tursku. Rezultati upućuju na to da postoji dinamična veza između naftnih šokova, istambulskog tržišta dionica, tečajne stope i kamatnih stopa.

Ključne riječi: *naftni šokovi, ISE-100, kamatne stope, tečajne stope, vektorska autoregresija (VAR).*

OIL PASS-THROUGH TO DOMESTIC PRICES IN TURKEY: DOES THE CHANGE IN INFLATION REGIME MATTER?

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- Oil shocks
- Pass-through
-Regime-dependent impulse responses
- MS-VAR model

ABSTRACT

This paper investigates the existence of oil pass through to inflation under different inflation regimes in Turkey. In order to compare the difference between the oil pass-through effects in the low and high inflation periods we employ Markov Regime Switching Vector Autoregressive (MS-VAR) model as a non-linear estimation framework. The regime-dependent impulse responses do not indicate strong pass through from crude oil prices to inflation in both regimes. However, this channel is working through refined petroleum product prices. The results show that there is a substantial decline in pass-through from refined petroleum prices to inflation as the economy moves from high to low inflation regime. These findings support the hypothesis of Taylor (2000) suggesting that low inflationary environment leads to a low pass-through.

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I. INTRODUCTION

The price of oil and overall price level in an economy are usually seen as being connected together. The main reason is that oil products are not used only as final consumer goods but also used as inputs for almost all kind of economic activities, and a price change in oil products assumed to be passing through to the prices of other products via direct and indirect ways. Direct effects are referred to the initial increases in the consumer prices as energy constitutes an important share in final consumption, whereas indirect effects arise as a result of an increase in the producer prices that in turn pass on to the consumer prices.

The coexistence of two consecutive oil shocks and stagflation in the major world economies during the 1970's has attracted a great deal of research interest in order to understand the relationship between oil prices and economic activity. Earlier studies find that there is a strong pass-through effect of oil shocks on inflation. Using the St. Louis type equations augmented with the change in real oil prices covering the 1962-1982 sample period, Gisser and Godwin (1986) finds that crude oil prices has a significant effect on the macroeconomic variables including inflation in the U.S. Burbidge and Harrison (1984) consider seven OECD countries along with the U.S. and estimate a seven-variable VAR model compromising industrial production, crude oil and consumer prices and the other key macroeconomic variables covering the period 1962-1982. Their impulse-response and historical decomposition results suggest that both 1973 and 1979 oil shocks have led to significant inflation in developed economies.

Oil prices remained stable for almost two decades after a decreasing period in the early 1980's with few exceptions. The upcoming years after 2000 witnessed a much more volatile and higher oil prices on average. However studies conducted after 2000s find that strong pass-through effect has declined as other determinants of inflation have been lessened by either structural change or controlled by policy makers in the developed economies. For example, Hooker (2002) finds that oil price pass through effect is negligible after 1980 in USA, estimating a Phillips curve model. LeBlanc and Chinn (2004) also based on Phillips curve framework; find that oil price increases have small effects on inflation in five developed countries. Blanchard and Gali, (2007) based on their VAR analysis dividing the sample as pre 1983 and post 1984 show that the dynamic effects of oil shocks have decreased over time in six developed countries subject to the analysis.

The results obtained from different studies suggest that the effects oil shocks on economic activity and consumer prices vary across the countries, and the investigation periods. Taylor (2000) argues that the pass-through effects are nonlinear, i.e. there is little pass through when the economy experiences a low inflation environment, and vice versa. Chen (2009), using a state space approach to cover time varying effects within a vector error correction (VEC) model, confirms the recent findings that pass-through effects into inflation have been declining, based on data from 19 industrial countries. However, he finds no evidence to support Taylor hypothesis that a lower inflation environment can lower pass- through effects.

In this study we aim to extend the empirical literature on the pass through effects of oil prices on inflation in a developing country perspective. Turkey is an interesting case in some distinguished ways. First, Turkey has moved from high to low inflation regime as a result of the implemented stabilization program following the November 2000-February 2001 crisis, and this led to changes in the estimated parameters in modeling inflation (see, Önder, 2009

for details). Second, oil constitutes a high share in total energy consumption (32 %)[3] in Turkey, and 95 % of oil demand is supplied by imports (EMRA, 2010).

The share of crude petrol constituted around 5 % of total imports in Turkey by 2009. These features make the Turkish economy not only vulnerable to the world prices of oil, but also to the exchange rates**.** Another interesting feature of Turkey is that taxes imposed on oil products are the highest in the world and constitute nearly 70 % of prices. Therefore, an increase in the oil prices may also have an indirect disinflationary effect given the increasing tax revenues help government to reduce budget deficit[4].

Despite the importance of oil in Turkish economy, relatively few studies have analyzed the effects of oil shocks on inflation. Aydoğuş (1993), and Berument and Taşçı (2000) investigate the effects of oil shocks using Input-Output analysis at the sectoral level. They found weaker support for the inflationary effects of oil prices. Along with the sectoral Input-Output analysis Kibritçioğlu and Kibritçioğlu (1999) employ a linear VAR model including inflation, oil prices including the other key macroeconomic variables with a relatively short sample (monthly data from 1986:01 to 1998:03). Their result does not indicate any direct and significant oil pass through. We find only one study Çatık and Önder (2011) investigating the inflationary impacts of oil prices by employing a nonlinear model. In that study, oil price-augmented Phillips curves are estimated with Markov regime-switching models covering the period 1996-2007. The regime-switching regressions reveal the existence of two different regimes characterized as the high- and the low-inflation periods. They find evidence for asymmetric oil pass-through in the high-inflation regime. Their results confirm the Taylor hypothesis suggesting that the pass-through effect of oil prices has declined significantly with the successful implementation of inflation targeting policy.

This main of this paper is to analyze the evolution of the pass-through effect of oil prices for Turkey under possible regime changes. Our study differs from the previous studies in two ways. First, unlike the single-equation Markov regime-switching Phillips curve estimates of Çatık and Önder (2011), we employ a Markov Regime Switching Vector Autoregressive (MS-VAR) model. Regime-dependent impulse responses derived from this model allow us to compare the significance of the difference between the oil pass-through under the high and the low inflationary periods. Finally, we use refined petroleum products index to establish the link between imported oil price changes and the inflation due to the key role of exchange rate movements and also taxes in the formulation of the petroleum products prices.

The rest of the paper is organized as follows. In the following section we introduce our data and methodology. Empirical findings on MS-VAR estimates and regime-dependent impulse response functions are presented in section three. Finally, conclusions are put forward in the last section.

[3] The ratio of oil in energy demand was around 45 % until 1996, before natural gas networks started to provide imported gas as an alternative energy resource.

[4] As one referee points out, increasing taxes may also cause an increase in consumption, and may impose no effect in the budget deficit.

II. Data and Methodology

A. Data

In order to analyze inflationary effects of oil prices we construct a six variable VAR system. A similar recursive VAR model is first used by McCarty (1999) to analyze exchange rate pass-through. We use monthly data covering the period 1994:1-2009:10. [5] Variables in the model are mainly collected from the Central Bank of Republic of Turkey (CBRT) Electronic Data Delivery System and Turkish Statistical Institute (TURKSTAT). The vector of endogenous variables used in the model is given as follows:

$$Y_t' = \left[Dlpet_t \; Dlrpet_t \; ipgap_t \; Dler_t \; Dlwpi_t \; Dlcpi_t \right] \quad \textbf{(1)}$$

All variables are in natural log-first difference form and seasonally adjusted except for exchange rate[6]. $Dlpet_t$ is the monthly change in the log of imported crude oil prices in US dollars. $Dlrpet_t$, calculated as the change in the log of refined petroleum products price index, is used to consider the dynamics of oil price determination. Using this variable we aim to establish the link between imported oil price changes and the inflation variables, this is not considered by the previous studies on Turkey. Output gap ($ipgap_t$) demand shock variable is measured as the gap between actual and potential industrial production. Hodrick and Prescott (1997) filter is used to compute potential output. $Dlne_t$ is the change in exchange rate computed as the monthly average of nominal Turkish lira–to–U.S. dollar exchange. $Dlnwpi_t$ and $Dlncpi_t$ are the inflation variables based on Wholesale Price Index (WPI) and Consumer Price Index (CPI), they are also calculated in terms of month on month change in the natural log price indices. [7]

B. Markov Switching Vector Autoregressive Model

Nonlinear impulse responses used in this study are derived from MSIH (Markov Switching Intercept Heteroscedasticity) specification of MS-VAR model proposed by Krolzig and Toro (2001) and Krolzig (2006). MSIH (Markov Switching Intercept Heteroscedasticity) specification covers regime-dependent intercepts and variance of the residuals and regime invariant autoregressive coefficients. Regime-dependent impulse responses can analyze the reaction of the variables to Gaussian innovations under different regimes. In addition, the regime-dependent responses also allows us to measure the responses of variables to the

[5] Estimation sample is determined by the availability of refined petroleum product price index obtained from TURKSTAT. Refined petroleum products index is a subcomponent of wholesale prices and includes the prices of gasolines, kerosene, distillate fuel oils, lpg (liquefied petroleum gas), asphalt, lubricating oils, diesel fuels, and residual fuels.

[6] Unit root properties of the variables are checked with ADF and Phillips Perron tests. All variables are found to be I(0) at least at 5% significance level. Since those tests ignore implications of structural breaks on the integration levels of the variables, Zivot and Andrews (1992) unit root tests are also applied. This test confirms the stationarity of variables under a structural break. The results of those tests are available upon request from the corresponding author.

[7] Turkish Statistical Institute (TURKSTAT) has stopped the publication of Consumer and Wholesale price indices with 1994 base year in 2005. Therefore 2003 base year series are combined with the earlier series to obtain the price changes after 2005.

transition from one to another regime.These steps are followed to derive regime-dependent impulse response functions (Krolzig and Toro, 2001 and Krolzig, 2006).[8] First MS-VAR model is defined by the following equations,

$$Y_t = v(s_t) + A(L)Y_{t-p} + u_t, \quad (2)$$

$$u_t \sim NID(0, \Sigma(s_t)). \quad (3)$$

Where $A(L)$ represents a regime invariant polynomial with order lag order *p*. The state variable s_t is an unobserved variable determining the state of the regime. Y_t is the previously defined vector of endogenous variables. This model assumes that state variable s_t follows an ergodic *M*-state first order Markov chain defined by the following transition probabilities:

$$p_{ij} = \Pr[s_t = j \mid s_{t-1} = i], \quad \sum_{i=1}^{m} p_{ij} = 1 \quad i, j = 1, ..., M. \quad (4)$$

Where *M* denotes the number of possible regimes and p_{ij} is the probability that event *i* is followed by event *j*, and a member of the following transition matrix:

$$P = \begin{bmatrix} p_{11} & p_{21} & \cdot & \cdot & \cdot & p_{M1} \\ p_{12} & p_{22} & \cdot & \cdot & \cdot & p_{M2} \\ \cdot & \cdot & \cdot & \cdot & \cdot & \cdot \\ p_{1M} & p_{2M} & \cdot & \cdot & \cdot & P_{MM} \end{bmatrix} \quad (5)$$

The estimation of MS-VAR model is based on maximum likelihood method. based on Expectation Maximization algorithm by Dempster *et al.* (1977).[9] In order to derive impulse responses from the estimated MS-VAR model, information about the realization of the state variable s_t is collected to the following regime vector ξ_t,

$$\xi_t = \begin{bmatrix} I(s_t = 1) \\ . \\ . \\ . \\ I(s_t = M) \end{bmatrix} \quad (6)$$

[8] MS-VAR models are estimated with Krolzig's MS-VAR package written in Ox.

[9] Maximization of likelihood function includes two stages according to EM algorithm. In the first stage initial values of the parameters are determined and then based on the initial values transition probabilities are computed. In the second stage called as maximization, maximum likelihood estimates of parameters are obtained using the previously computed transition probabilities. These stages are repeated until the parameters converge. Filtered and smoothed probabilities computed through the EM algorithm are used to determine classification of the regimes.

Where the indicator variables are defined by the following vector

$$I(s_t = m) = \begin{cases} 1 \;\; if\; s_t = M \\ 0 \; otherwise. \end{cases}$$

for $m = 1, \ldots, M$. Using the regime vector ξ_t, MSIH(M)-VAR(p) representation of the model can be reformulated as follows:

$$Y_t = H\xi_t + A(L)Y_{t-p} + u_t \qquad (7)$$

Where $H = \begin{bmatrix} M \\ . \\ . \\ . \\ 0 \end{bmatrix} = \iota_1 \otimes M$ and u_t is vector of error terms and $\mathbf{i}_j$ is the j^{th} column of the identity matrix.

State space representation of MS-VAR model is completed by the following first order Markov chain:

$$\xi_{t+1} = F\xi_t + v_t, \qquad (8)$$

where v_t is the vector of normally distributed error terms and F is transpose of the transition probabilities matrix. Using this information, the expectation of Y_{t+h} is calculated as :

$$Y_{t+h|t} = H\xi_{t+h|t} + AY_{t+h-1|t}, \qquad (9)$$

where the conditional expectation of ξ_{t+h},

$$\xi_{t+h|t} = F^h\xi_t. \qquad (10)$$

If variance covariance matrix of Σ_u does not change with respect to regime, linear impulse responses is calculated using (8) as follows:

$$\frac{\partial Y_{t+h|t}}{\partial u_{jt}} = JA^h\iota_j, \qquad (11)$$

Where $J = [I_k \quad 0 \quad . \quad . \quad . \quad 0] = \iota_1' \times I_K$ denotes a matrix with (*Kx Kp*) dimension. If variance covariance matrix of Σ_u becomes regime-variant, regime-dependent impulse responses based on the responses of the variables to the same shocks under different regimes, is calculated as

$$\frac{\partial Y_{t+h|t}}{\partial \varepsilon_{jt}} = JA^h D(\xi_t)\iota_j, \qquad (12)$$

Where $D(\xi_t)$ represents the lower triangular matrix computed from Cholesky decomposition of regime-dependent variance covariance matrix of $\sum_u(\xi_t) = D(\xi_t)D(\xi_t)'$.

III. Empirical Results

Before proceeding to impulse response analysis, linearity of the model is checked. For this purpose two regime MS-VAR model, MSIH(2)-VAR(*p*), and its linear counterpart are estimated up to 6 lags and the log-likelihood, Akaike information Criterion (AIC), Schwarz Bayesian Criterion (SBC) and Hannan Quinn Criterion (HQC) values are reported in Table 1. The log likelihood values of the MS-VAR models are higher than that of corresponding linear VAR model. The best fit is obtained when MS-VAR is estimated with 2 lags. When we compare the information criterions of MS-VAR model with the Linear VAR model, the MS-VAR model fit is better than the linear VAR model since it has lower AIC, SBC and HQC values. Along with the information criterion, Likelihood Ratio (*LR*) linearity tests based on the difference between the log-likelihood of MS-VAR and Linear VAR are also computed. The LR linearity tests reject the null hypothesis of Linear VAR model against the alternative of MSIH specification in all lags hence they also provide a further evidence in favor of nonlinear model.

TABLE 1. Testing the Nonlinearity and Lag Length in MS-VAR Model

No. of Lags	1		2		3	
	MS-VAR	Linear VAR	MS-VAR	Linear VAR	MS-VAR	Linear VAR
Log-likelihood	2564.166	2415.281	2760.640	2582.699	2644.188	2531.507
AIC criterion	-26.161	-24.892	-26.335	-24.874	-25.864	-24.979
HQ criterion	-25.266	-24.186	-25.521	-24.454	-24.475	-23.791
SC criterion	-23.960	-23.811	-24.583	-23.176	-22.434	-22.046
LR linearity test	297.7694	(0.00)	355.8838	(0.00)	225.3628	(0.00)
No. of Lags	4		5		6	
	MS-VAR	Linear VAR	MS-VAR	Linear VAR	MS-VAR	Linear VAR
Log-likelihood	2628.057	2489.539	2599.687	2449.567	2717.008	2564.509
AIC criterion	-26.075	-24.916	-26.155	-24.759	-26.254	-24.947
HQ criterion	-24.935	-23.978	-24.445	-23.070	-24.614	-23.509
SC criterion	-23.262	-22.600	-21.669	-20.591	-22.206	-21.397
LR linearity test	277.0364	(0.00)	300.2399	(0.00)	304.9982	(0.00)

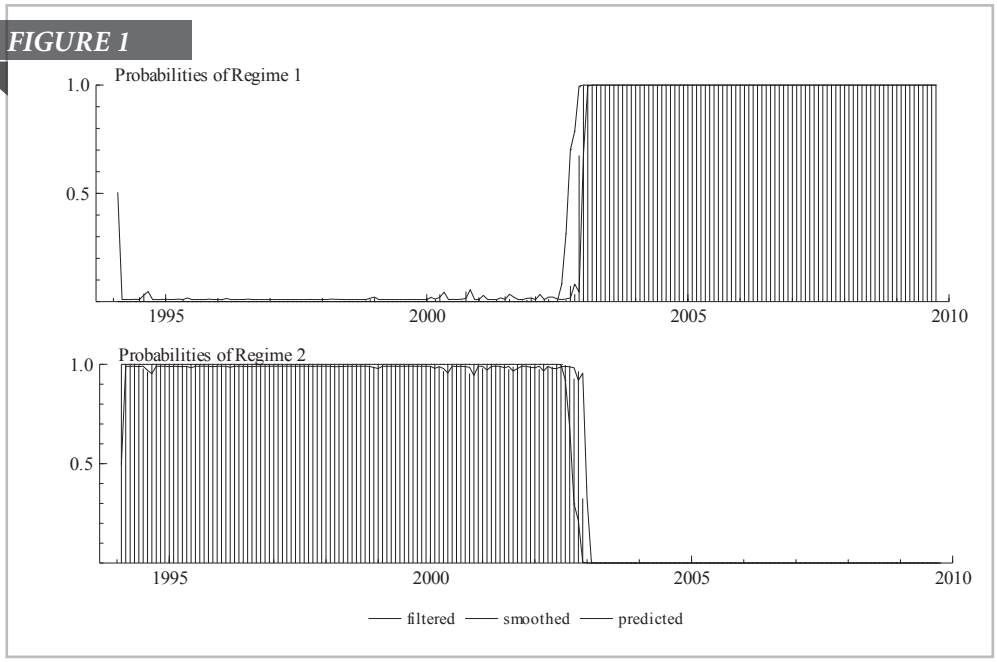
SOURCE: Author

Notes: The probability of Likelihood Ratio (LR) linearity test are given in parentheses.,The LR linearity test tests the null hypothesis that the true model is a linear against the alternative of MSIH and is distributed as $\chi^2(q)$ *where q is equal to the number of restrictions under which the two models are identical.*

The Maximum likelihood estimation of the selected MSIH(2)- VAR(2) model is reported in Table A1. The diagnostic statistics, autocorrelation functions (ACF) and the partial autocorrelation functions (PACF) and the spectral density suggest that MS-VAR residuals are not significantly autocorrelated. Quantile-Quantile (*QQ*) plots also indicates roughly normality of the residuals and hence the model is correctly specified (see Figure A2 in Appendix).

SMOOTHED AND FILTERED PROBABILITIES OF MS-VAR MODEL

FIGURE 1



SOURCE: Author

Smoothed and filtered probabilities illustrate the regime classifications computed through the EM algorithm (see Figure 1). As it seen, regimes are properly identified by high transition probabilities. Regime 1 covering the period 2002:10 - 2009:10 can be identified as the low inflation regime with 9.69% average annual CPI inflation. During that time inflation targeting strategy with floating exchange rate is implemented within the maintaining price stability objective of the Central Bank of Republic of Turkey. As a result of the inflation targeting policy, inflation was successfully decreased to single-digit level by the end of 2004. Regime 2 covering the period up to 2002:10 can be characterized as the high inflation regime, with average annual inflation rate of 53.6%. During that period Turkish economy experienced 1994 and 2001 crises as a result of the banking sector fragility and accumulating current account deficits (Akyürek, 2006).

TABLE 2. Transition Probabilities and Regime Properties

	Transition Probabilities		
	Regime 1	Regime 2	
Regime 1	0.977	0.023	
Regime 2	0.033	0.967	
	Regime Properties		
	Number of Obs.	Prob.	Duration
Regime 1	84.9	0.449	44.248
Regime 2	104.1	0.551	30.488

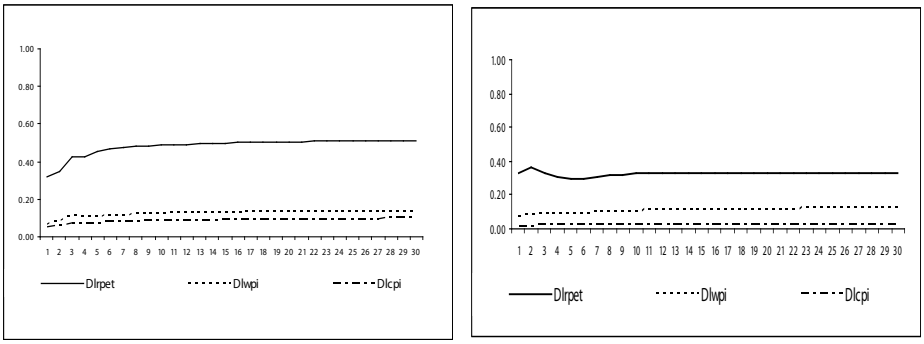
SOURCE: Author

The properties and transition probabilities of the high and low inflation regimes are reported in Table 2. Regime 2, high inflation regime, has more number of observations with the longest duration and highest probability. Regime 1 has a shorter duration, with 30 months and contains 45% of the total number of observations. Diagonals of the transition matrix (p_{11} and p_{22}) illustrating the probabilities of the system remaining in the current regime are found to be more than 90% for both regimes. Therefore regimes are persistent, when the system is exposed to an exogenous shock, it will most likely move towards the same regime.

Having estimated regime switching model, we compute regime-dependent impulse-response functions based on equation (12). To compare cumulative impulse response figures between the low and high inflation regimes in terms of magnitude pass-through coefficients are calculated following Rabanal and Schwartz (2001). Accordingly, pass-through coefficients are computed as the ratio of the j-month cumulative response of the each variables to the j-month cumulative response of the variables own shock. [10]

CUMULATIVE RESPONSES TO ORTHOGONAL SHOCK TO $Dlpet_t$

FIGURE 2



Regime 2 (High Inflation Regime) Regime 1 (Low Inflation Regime)

SOURCE: Author

Figure 2 reports cumulative responses of refined petroleum, wholesale and consumer prices to imported oil price shocks. The responses of inflation variables to imported crude oil price shocks are found to be very limited as far as both regimes are concerned. This may suggest

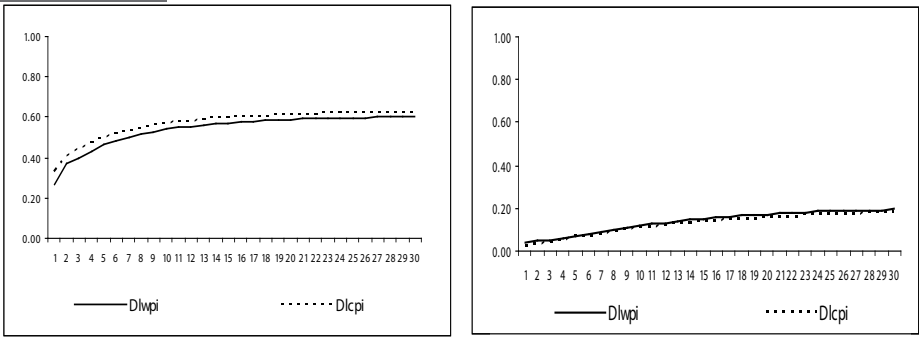
[10] The pass-through coefficient is calculated as $PT_{t,\,t+j}=Pt,\ t+j\ /\ E_{t,\,t+j}$ where P_{t+j} is the cumulative change in the price level and E_{t+j} is the cumulative change in the exchange rate between months t and t+j.

the insignificance of direct inflationary impact of crude oil prices. However, the pass through from oil prices to refined petroleum prices is found to be higher in Regime 2.

In the high inflation regime 13.7% of changes in imported crude oil prices are passed to wholesale prices within six months, this figure shows a slightly declining trend in the low inflation regime with 12.1%. However, the difference between high and low inflation periods are more pronounced when the pass-through to consumer prices are considered. Cumulative effect of pass-through to CPI has decreased from 9.7% to 2.8% as economy moves to low inflation regime. In the high inflation regime, the response of refined petroleum prices to oil shocks follows an increasing trend; starting with 33% in the first period and then reaching to 51% after twenty months. However refined petroleum products react in a different way in the low inflation regime; the response of this variable remains relatively stable, i.e. only % 33 of changes in oil prices are passes through to refined prices, and persists only eleven months.

CUMULATIVE RESPONSES TO ORTHOGONAL SHOCK TO $DLRPET_T$

FIGURE 3



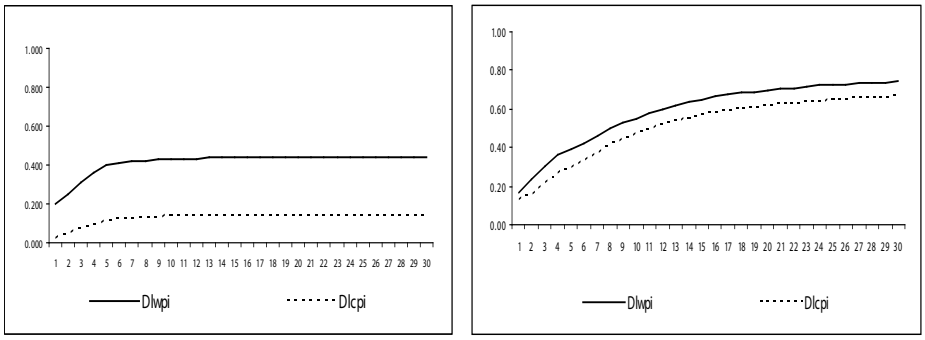
Regime 2 (High Inflation Regime) Regime 1 (Low Inflation Regime)

SOURCE: Author

Figure 3 shows that the responses of wholesale and consumer prices to the refined petroleum products prices have declined substantially in the low inflation regime. This evidence supports the proposition of Taylor (2000), low inflationary environment lowers the pass-through. In the high inflation regime 27.1 % of changes in refined petroleum prices are passed-through to WPI in the first month, at the end of the period 60.2% of changes are reflected. However in the low inflation regime pass-through to that variable is limited with 19.4% and it is completed within 24 months. Responses of consumer prices is slightly higher than that of wholesale prices in the high inflation regime with 62.4%, however as economy moves to low inflation regime it becomes lower with 17.9% even than the responses of wholesale prices.

CUMULATIVE RESPONSES TO ORTHOGONAL SHOCK TO $Dler_t$

FIGURE 4



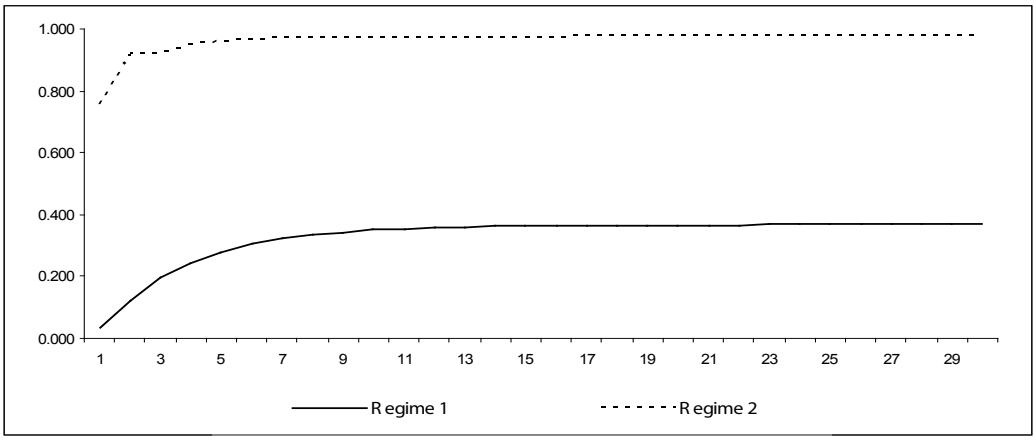
Regime 2 (High Inflation Regime) Regime 1 (Low Inflation Regime)

SOURCE: Author

Figures 4 and 5 provide some evidence on the intuition behind the decline in pass-through from refined petroleum prices in the low inflation regime. In the high inflation regime exchange rate pass-through to wholesale and consumer prices are 74.3% and 66.4%. However the respective figures are obtained as 43.9% and 14.4% in the low inflation regime. This decline can be attributed to change in the monetary policy regime. The implementation of inflation targeting strategy with floating exchange rate regime can be seen as a potential reason behind the decline in the oil pass-through.

CUMULATIVE RESPONSE OF $DLCPI_T$ TO $DLNWPI_T$

FIGURE 5



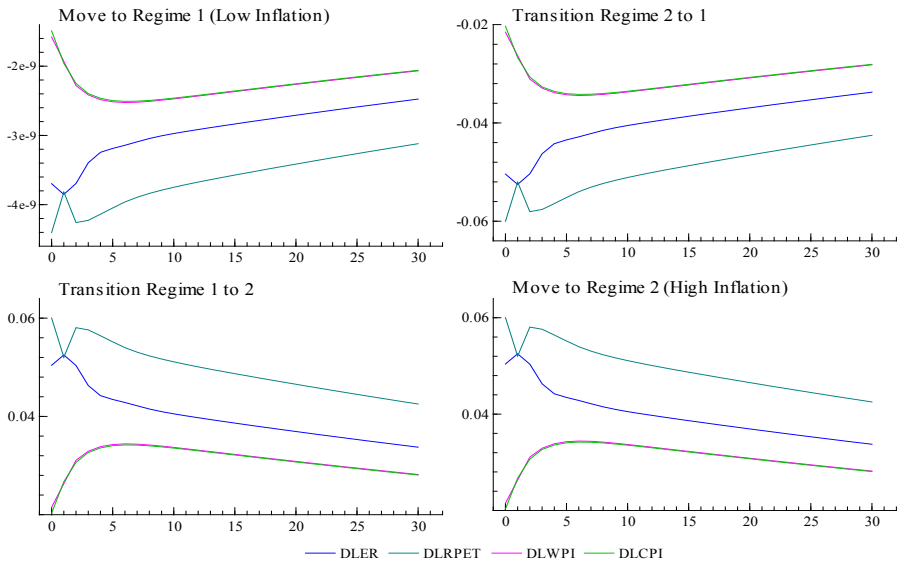
SOURCE: Author

Figure 5 shows that decline in pass-through from refined petroleum prices to inflation variables can be also adhered to weakening the relationship between consumer and wholesale prices. Cumulative responses of consumer prices to wholesale prices were very fast, i.e. 71.5% of the changes are reflected within four months. However the response of consumer prices decreased to 36.7% as economy moves to the low inflation regime.

In addition to the responses to shocks in the variables, regime-dependent responses also allow us to analyze the responses of variables to the transition from high to low inflation regimes.[11] The responses of prices and exchange rates to regime changes plotted in Figure 6 are in line with general findings of cumulative responses. Figure 6 shows that low inflation regime tends to be associated with exchange rate appreciation and the decline in the refined petroleum prices. The reverse type of this movement can be seen in the case of high inflation regime. The responses of variables to regime 2 are found to be considerably larger than those of regime 1, providing further support for the proposition of Taylor (2000). The responses of variables to regime changes follow similar patterns, except crude oil price changes. It is also remarkable that wholesale and consumer prices have identical regime shift responses in each regime.

RESPONSES TO REGIME SHIFTS

FIGURE 6



SOURCE: Author

[11] See Krolzig and Toro (1998) for the mathematical details on the derivation of regime shift responses.

IV. CONCLUSION

This paper analyses the existence of oil pass through to inflation under different inflation regimes in Turkey. In order to consider the impacts of non-linearity and structural breaks regime-dependent impulse response analysis based on MS-VAR model is employed.

Our estimates reveal the nonlinearity of the oil pass-through and indicate the existence of two different regimes characterized as the high and low inflation periods. We do not find strong direct pass through from imported oil prices to inflation in both regimes; this channel is working rather on refined petroleum product prices. This can be explained by the high taxes and exchange rate movements that break down the relationship between world and domestic prices in most of the oil importing developing countries.

Nonlinear regime-dependent impulse responses reveal the substantial decline in pass-through from refined petroleum prices to inflation as the economy moves from high to low inflation regime. In this respect, our analysis provides an empirical support for the proposition of Taylor (2000) low inflationary environment lowers the oil pass-through in Turkey.

Our results suggest that the decline in pass-through from refined petroleum prices in the low inflation regime can be largely attributed to the decline in the exchange rates. Therefore, for oil importing countries such as Turkey, policy makers should also consider exchange rate movements in the analysis of oil pass through. It is also interesting to note that the link between wholesale and consumer prices is weakened in the low inflation regime. The responses of consumer prices to wholesale prices are found to be very significant in the high inflation regime. However there is a substantial decrease when economy moves to low inflationary environment.

The results of this study point out that the extent of oil pass-through to domestic prices also is also determined by the overall macroeconomic environment. In this respect the achievement of price stability after the implementation of inflation targeting strategy seems to play a major role in the absorption of oil shocks in Turkey. Regime changes should be also taken into account by forecasting studies to provide more reliable predictions. In developing countries where taxes constitute a high portion of oil product prices, fiscal policy and monetary policy are linked closely. Our results imply that governments should endure the expectations on overall price stability before counting on tax revenues from oil products.

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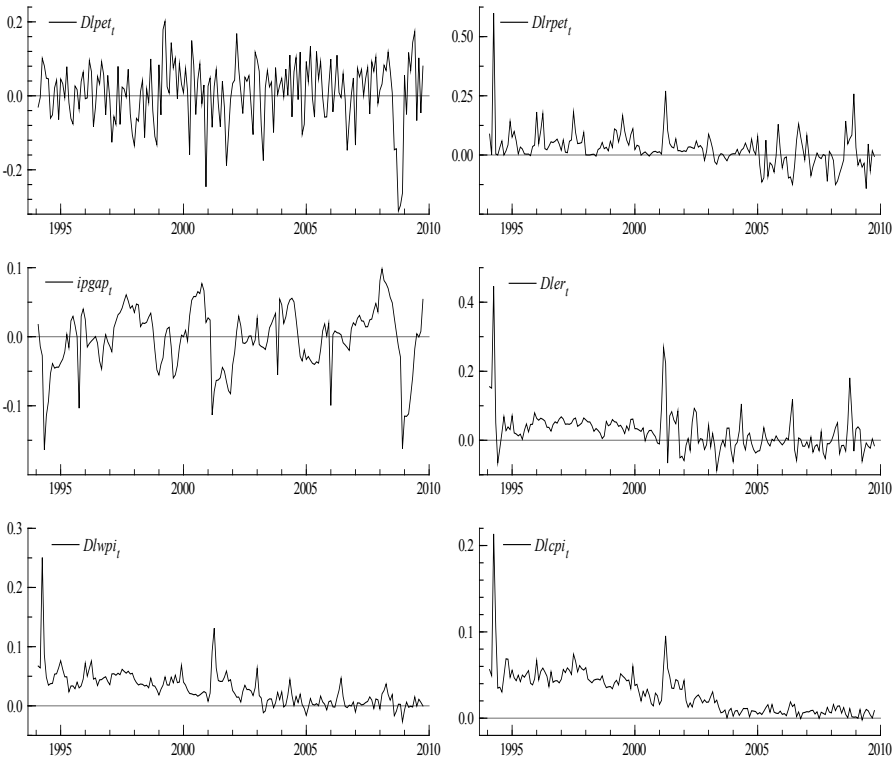
Appendix

VARIABLES IN THE MS-VAR MODEL

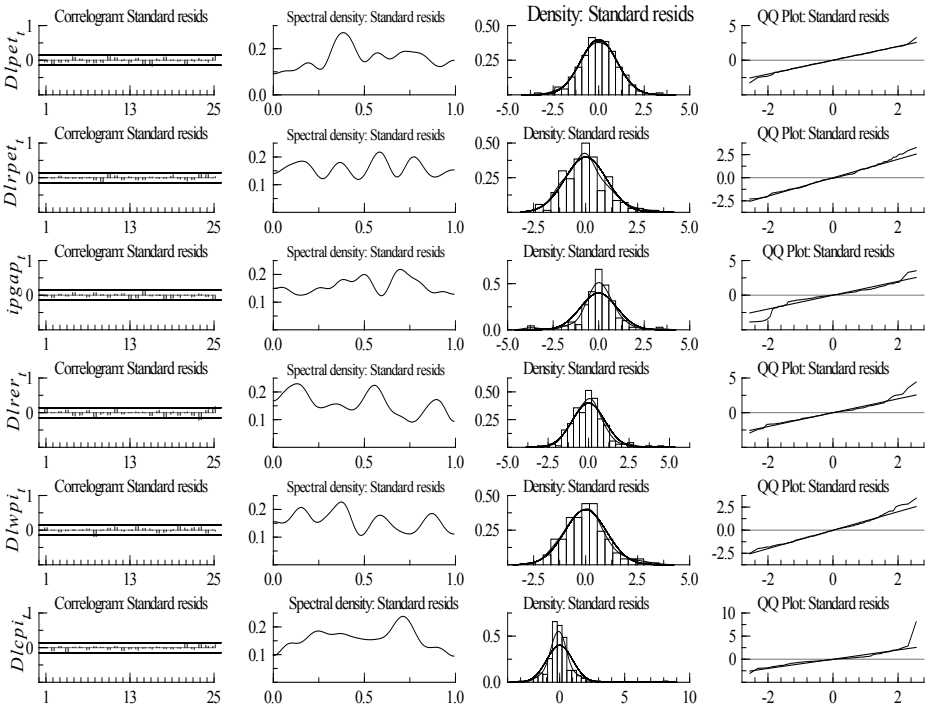
FIGURE A1



SOURCE: Author

RESIDUAL ANALYSIS

FIGURE A2



SOURCE: Author

Table A1. Maximum Likelihood Estimation of MS-VAR model

	$Dlpet_t$	$Dlrpet_t$	$ipgap_t$	$Dlne_t$	$Dlnwpi_t$	$Dlncpi_t$
Const(Reg.1)	0.013	-0.002	0.000	0.003	0.003	0.003
	(1.232)	(-0.304)	(0.124)	(0.620)	(2.143)	(4.372)
Const(Reg.2)	0.020	0.037	0.009	0.046	0.017	0.018
	(1.819)	(2.504)	1.202)	(3.865)	(3.611)	(4.824)
$Dlnpet_{t-1}$	0.073	0.033	0.004	-0.004	0.012	0.007
	(2.02)	(1.506)	(0.151)	(-0.105)	(1.024)	(0.852)
$Dlnpet_{t-2}$	0.061	0.022	0.031	0.005	-0.012	0.006
	(2.34)	(2.094)	(1.218)	(0.131)	(-1.152)	(0.788)
$Dlrpet_{t-1}$	0.071	0.256	-0.024	0.034	0.002	0.003
	(0.675)	(3.977)	(-0.631)	(0.680)	(0.102)	(0.273)
$Dlrpet_{t-2}$	-0.151	0.015	-0.062	0.105	0.008	0.001
	(-1.512)	(0.251)	(-1.686)	(2.162)	(1.720)	(1.739)
$ipgap_{t-1}$	-0.101	-0.124	0.619	-0.053	-0.016	-0.002
	(-0.517)	(-1.107)	(8.272)	(-0.544)	(-0.571)	(-0.124)
$ipgap_{t-2}$	-0.159	0.096	0.116	0.173	0.015	0.008
	(-0.883)	(0.935)	(1.692)	(1.917)	(0.571)	(0.505)
$Dlne_{t-1}$	-0.314	0.030	-0.080	0.454	0.101	0.016
	(-1.801)	(0.304)	(-1.247)	(5.221)	(3.921)	(2.423)
$Dlne_{t-2}$	0.324	0.032	-0.069	-0.200	-0.051	0.029
	(2.066)	(0.349)	(-1.175)	(-2.468)	(-2.080)	(1.686)
$Dlnwpi_{t-1}$	0.290	0.270	-0.058	-0.053	0.285	0.115
	(0.580)	(0.940)	(-0.319)	(-0.208)	(3.640)	(2.128)
$Dlnwpi_{t-2}$	0.042	0.146	0.323	-0.018	0.195	0.075
	(0.089)	(0.529)	(1.849)	(-0.073)	(2.616)	(1.441)
$Dlncpi_{t-1}$	-0.155	-0.163	-0.312	-0.901	-0.197	0.265
	(-0.246)	(-1.047)	(-1.339)	(-2.717)	(-1.830)	(3.425)
$Dlncpi_{t-2}$	-0.441	0.681	0.048	0.549	0.248	0.159
	(-0.692)	(1.764)	(0.205	(1.645)	(2.212)	(1.968)
Std. Err. (Regime 1)	0.089	0.061	0.027	0.034	0.013	0.005
Std. Err. (Regime 2)	0.077	0.071	0.027	0.054	0.024	0.020

Note: t-statistics of the parameters are given in parentheses.

SOURCE: Author

PRIJENOS CIJENE NAFTE NA DOMAĆE CIJENE U TURSKOJ: JESU LI PROMJENE U REŽIMU INFLACIJE BITNE?

SAŽETAK

Ovaj rad istražuje postojanje prijenosa cijene nafte na inflaciju pri različitim režimima inflacije u Turskoj. Kako bi se usporedila razlika između efekata prijenosa cijene nafte na periode niske i visoke inflacije, koristili smo se vektorskim autoregresijskim modelom Markovljeve promjene režima (MS-VAR) kao nelinearnim okvirom procjene. Odzivi na impulse ovisni o režimu ne ukazuju na snažan prijenos cijena sirove nafte na inflaciju u oba režima. Ipak, taj kanal funkcionira sa cijenama rafiniranih naftnih proizvoda. Rezultati pokazuju da postoji konkretni pad u prijenosu cijena rafiniranih naftnih proizvoda na inflaciju kako se ekonomija premješta s visokog na režim niske inflacije. Ti rezultati podupiru Taylorovu hipotezu (2000) koja sugerira da okolina niske inflacije vodi ka niskom prijenosu.

Ključne riječi: *inflacija, naftni šokovi, prijenos, odzivi na impulse ovisni o režimu, MS-VAR modeli.*

DETERMINANTS OF NONLIFE INSURANCE MARKET ATTRACTIVENESS FOR FOREIGN INVESTMENTS: EASTERN EUROPEAN EVIDENCE

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ABSTRACT

The aim of this paper is to investigate factors that influence the attractiveness of nonlife insurance market for foreign insurers in Eastern Europe. We use country-specific effects models for panel data that covers fifteen countries during the period 2004-2009, allowing each cross-sectional unit to have a different intercept term serving as an unobserved variable that is potentially correlated with the observed regressors. The research results indicate that the main forces affecting market attractiveness are insurance demand, entry barriers, market concentration and the return on investment. These findings provide significant implications for local governments and for both foreign and domestic insurers.

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I. INTRODUCTION

Insurance was one of the first industries that became international. During the last twenty years, globalization became one of the most important issues for insurance industries across the globe. Deregulation, privatization and liberalization have facilitated globalization of risks and insurance services (see Swiss Re, 2000; Cummins and Venard, 2007). These processes have spread over Eastern European insurance markets too (Njegomir and Stojic, 2011). Instead of being centrally planned, they became market-oriented. Although some barriers remain, regional insurance markets have been generally opened to foreign investments. Combined with the privatization of state monopolies and deregulation, liberalization have facilitated foreign insurers' entry and generated more competitive local insurance markets.

Local economies tend to attract foreign companies in order to generate foreign investments inflows, improve competitiveness of local insurance markets and achieve the greater availability and more affordable insurance coverage. Although the study of the importance of market characteristics that influence foreign insurers' participation is important for local economies as well as for foreign and domestic insurers, to our knowledge, similar study for Eastern European countries is non existent.[3]

While factors that affect insurance demand and supply for non-life insurance have been studied extensively (for example, Outreville, 1990; Browne, Chung and Frees, 2000; Hussels, Ward and Zurbruegg, 2005), studies on the issue of market characteristics that relate to the participation of foreign insurers are generally scarce. Even when they are available (for example, Ma and Pope, 2003; Outreville, 2008) they are not focused on insurance markets of Eastern European region. Thus, the aim of this paper is to investigate factors that influence foreign insurers' participation, or in other words factors that affect the attractiveness of Eastern European non-life insurance markets for foreign insurers. The findings of this study will be of particular importance to policymakers that seek to better understand how they can influence participation of foreign insurers on local non-life insurance markets and take advantages of globalisation. Additionally, the findings will be of interest for foreign insurers that wish to enter or increase their participation on local non-life insurance markets but also for domestic insurers that seek to understand factors that could influence market competitiveness in order to develop their operations in a way that will provide successful competition with new entrants and to start or increase their cross-border presence on regional non-life insurance market.

We apply linear model for panel data. Panel data encompass 15 formerly communist European states for the period 2004-2009.[4]

The remainder of this article is organised as follows. In this chapter we briefly present historical specificities of Eastern European insurance markets followed by review of literature on determinants of insurance market attractivenes in different lines of insurance as well as different regions of the world. We observe that most authors agree on key macro factors which we use too in our analysis. In section 3 we describe the data and variables we shall apply in

[3] Insurers can participate in foreign markets either through cross-border or establishment trade (Skipper and Kwon, 2007). Cross-border trade exists when insured domiciled in one country purchases insurance coverage from insurer that is domiciled in another country. Establishment trade exists when insured and insurer are domiciled in the same country. We limit our discussion here on establishment insurance trade.

[4] Countries included in our analysis are Bosnia and Herzegovina, Croatia, Former Yugoslav Republic of Macedonia, Montenegro, Slovenia and Serbia. Former East Block countries are the following: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, and Slovakia.

the regression model. Results of the model are presented in section 4 where we conclude that the results are in line with previous studies. Finally, in section 5 we address policy makers and insurance companies in clarifying the implications of the results of our research.

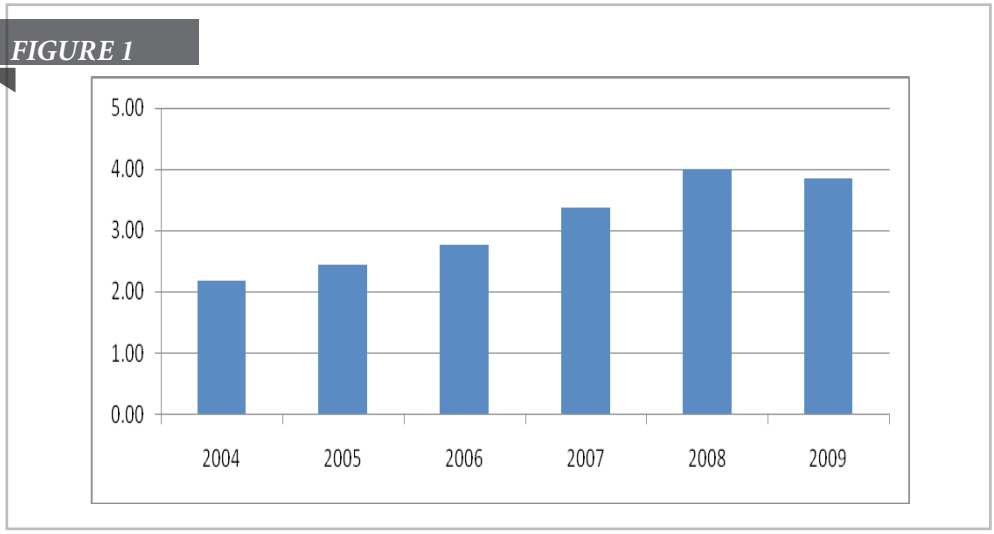
In the last two decades countries of Central and East Europe have experienced tremendous changes of political, cultural, social and economic environment. All countries have had communist regimes and centrally planned economies. During transitory period towards market economy some of countries have been politically disintegrated, some have been seized by war while some have experienced extraordinary high inflation rates. Different political and economic transitory paths have predetermined the development of insurance industries. All of the developments that have happened or are still happening in the observed countries can be grouped into two periods, one period being from 1989 to 2004 and the other being from 2004 to the present. The first period, which depicts the initial transition of insurance markets in observed countries, is analysed in detail by Pye (2000). This article aims to investigate factors that affect the attractiveness of Eastern European non-life insurance markets for foreign insurers in the period 2004-2009.

The period 2004-2009 was influenced by many political, social and economic developments that have influenced the development of observed insurance markets. The most important was the integration of majority of countries in the EU. Poland, Slovakia, Czech Republic, Hungary, Slovenia, Latvia, Lithuania and Estonia became EU member states in 2004 while Romania and Bulgaria became member states in 2007. Additionally, all countries of former Yugoslavia are in some stage of negotiations for EU membership. All countries that became members of the EU have changed their insurance regulations, increased transparency of insurance industry and liberalised insurance markets in accordance with the established EU regulations. Countries still outside the EU zone also changed their regulations in accordance with the EU regulations as a result of their aspirations to become EU member states. The other crucial development during the observed period was economic crisis that has negatively influenced insurance industry in all countries.

The word 'potential' is often used to describe the observed markets, often referred to as 'emerging Europe'. The growth of non-life insurance premium was significant during the period 2004-2008, but turned negative in 2009 because of economic recession. During the observed period, relative annual growth of non-life insurance premium in the region was 11.47 percent, 13.58 percent, 22.33 percent, 18.80 percent and -4.16 percent respectively. However, despite the recent growth these markets are still undeveloped in terms of total premium volume, low share of life insurance in total premium, the predominant share of obligatory auto liability insurance (in average above 60 percent in non-life insurance premium), high market concentration (the obvious legacy of the communist era), insurance penetration and density. Figure1 illustrates constant growth of non-life insurance premium in Central and Eastern European countries and its share in world premium. The share of regional in global insurance premium was between 2 percent and 4 percent during the observed period, while its share in world population was around 4.7 percent. The average premium per capita of USD 55.8 when compared with USD 1572.8 in North America and USD 1811.1 demonstrate significant underdevelopment, but also potential for future growth.

NON-LIFE INSURANCE PREMIUM IN CENTRAL AND EASTERN EUROPE – SHARE OF WORLD MARKET (2004-2009)

FIGURE 1



SOURCE: Swiss Re (2005, 2006, 2007, 2008, 2009 and 2010)

As a result of first and especially the second phase of transition, foreign insurers' participation has increased in local markets. The most significant increase of foreign insurers' participation during the period 2004-2009 has been marked in Bulgaria (from 52 percent to 82 percent), Croatia (from 19 percent to 31 percent), Montenegro (from 23 percent to 83 percent), Serbia (from 69 percent to 93 percent) and FYR of Macedonia (from 50 percent to 91 percent).[5] Other countries retained relatively flat, but above 50 percent foreign insurers participation. The only exception has been insurance market in Slovenia where foreign insurers' participation was around three and five percent. Theoretically, the potential arrival of foreign competitors holds acute implications for current market competitors, and the viability of foreign entry is heavily influenced by government policies on market liberalization (Skipper, 1998). However, only limited investigation of the impact of liberalization on the market concentration–profitability relationship has been undertaken (for example, Mann, 1966; Qualls, 1972; Jenny and Weber, 1976; Caves, Porter, and Spence, 1980). Thus, in the conceptualisation of the idea for the research we have chosen the period 2004-2009 for these still developing markets in order to investigate factors that influence the attractiveness of insurance market for foreign insurers.

II. LITERATURE REVIEW

All previous studies that examine companies' participation in foreign markets can be divided into two categories: those that focus on firm-specific issues of companies entering foreign markets and those that focus on market-specific characteristics that facilitate or hinder foreign companies' presence. The first group of research studies focuses on international diversification (Capar and Kotabe, 2003) and firm-specific competences (Dunning, 1977; Bartlett and Ghoshal, 1989; Rugman and Verbeke, 2004) as motivators for the establishment

[5] We exclude cross-border trade, that is, premiums underwritten directly by insurance companies established in other EU member states.

of foreign market presence. Other studies emphasize the market specific characteristics as key motivators for foreign companies' presence. Some studies (Agarwal and Ramaswami, 1992; Rugman and Verbeke, 2004) indicate that both firm-specific and market-specific factors jointly influence companies' participation in a specific national market.

Clarke et al. (2003) give one of the most comprehensive reviews on existing studies related to the banking industry. A substantial body of literature has been reviewed, for both location-specific factors and approaches that had examined bank-specific factors that influence banks' entry into foreign markets. Also Soussa (2004) points out that research studies found that profit opportunity, information costs, deregulation and, specific for the U.S., relaxation of restrictions on interstate banking, have influenced banks' entry into foreign markets.

In the insurance literature, qualitative studies that have examined factors affecting insurers' international operations appeared first. Schroath and Korth (1989) examined the U.S. property and liability companies, and learnt that knowledge of foreign markets represents a major managerial barrier to foreign market entry. Based on in-depth interviews with insurance executives, Zimmerman (1999) found that barriers, especially non-tariff, are one of the factors that influence managerial decision to entering foreign markets but become critical factor if they create prohibitive costs or difficulties.

The insurance related literature has only recently focused on empirical, quantitative studies when examining factors that affect companies' presence in foreign markets. Moshirian (1999) focused on cross-border trade and foreign direct investment in insurance services using a model for British and German foreign direct investments in insurance. His findings suggest that in addition to insurance premiums, national income of the host country, bilateral trade, labor and capital costs and economic growth, the expansion of international insurance services complement those in banking. Elango (2003) examined the internationalization of the U.S. reinsurance industry and found support for previous studies done for the insurance industry. U.S. reinsurers export their services to countries with large markets, high income per capita and insurance prices, where firms operate internationally, whilst cultural distance was found to be insignificant. Donghui and Moshirian (2004) found that national income, source countries' insurance market size and host countries' financial development facilitates, while the relatively higher wages and higher costs of capital in the host countries restrain foreign direct investments in insurance services in the U.S.. Berry-Stölzle, Hoyt and Wende (2010) examined successful business strategies for insurance companies entering foreign markets for the period 2004-2007 and found that although these strategies vary across countries they generally involve a high growth rate, increased size and emphasis on life insurance. They also found that better risk-adjusted performance is associated with lower financial leverage and mutual organizational form. Ma and Pope (2003) empirically examined the importance of foreign market characteristics that have decisive role for the participation of international insurers in the non-life business of industrialized countries for the period 1995-1998. Their research indicates that market structure is important factor in determining whether international insurers would participate in a given foreign market but when markets are not competitive, removing of trade barriers significantly improves the attractiveness of host countries. Additionally, their results suggest that the development of economy in general is positively correlated with the involvement of foreign insurers. Outreville (2008) examined the factors that influence the participation of the world's largest insurance companies in some transitional and developing countries based on data for the year 2003 only. The study results indicate that location-specific factors, namely the size of a market, human capital, and good

governance explain internationalization of insurance groups. The study also suggests that cultural distance, regulatory barriers and market competitiveness significantly influence the host country choice by transnational insurance companies.

Although, Berry-Stölzle, Hoyt and Wende (2010) included insurance markets of Croatia and Bosnia and Herzegovina in their examination of successful business strategies for insurers entering emerging markets, neither of the previous studies does not focus examination of location-specific factors for foreign insurers participation on Eastern European economies. Although our research contains results that extend and complement those in existing literature, the main contribution of the research presented in this paper is original. We depart from Ma and Pope (2003) as we use data for transition countries of Eastern Europe; in which sense we are close to Outreville (2008), but depart from his study as our examination exploit time series data instead of single year observation.

III. DATA AND METHODOLOGY

We focus our analysis here on factors that determine the attractiveness of a non-life insurance market for foreign insurers' participation. For a detailed insight to definitions of variables used in the analysis we direct the interested reader to Njegomir and Stojic, (2010).

We use foreign companies' premiums (*FP*) in gross written non-life premium per capita, calculated for each national market, as a proxy for market attractiveness. Factors that we use as control variables, which may explain the attractiveness of a market for foreign insurers, include the following: market competitiveness (*HHI*), barriers to entry (*LIB*), human capital (*HCI*), insurance demand (*ID*), foreign direct investments (*FDI*), market profitability (*PR*) and return on investment (*ROI*). Following Ma and Pope (2003) we include a variable interacting market competitiveness and barriers to entry (*HHILIB*) to control for their interactive relationship and its impact on market attractiveness.[6]

Data cover 15 countries, 6 of which were formerly constituent republics of Socialist Federal Republic of Yugoslavia, and 9 countries of the former East Block, over the time period 2004-2009. We observe an integral linear model encompassing all of the observed variables. Number of observations for each country varies between 5 and 6, depending on data availability, total of 88 observations. Descriptive statistics of cross-sectional and time-series data for each variable depicting market attractiveness are shown in Table 1.

TABLE 1 - Observed Variables' Descriptive Statistics

	FDI	FP	GDP	HCI	HHI	LIB	PR	ROI
Mean	578	80,050	8.101	0,714	0,795	61,576	0,140	0,022
Median	397	64,187	7.952	0,731	1	61,450	0,132	0,018
Maximum	5.277	315,186	18730	0,876	1	77,952	0,420	0,105
Minimum	1	1,651	2.476	0,422	0	44,700	-0,143	-0,070
Std. Dev.	760	64,312	4.309	0,120	0,344	7,879	0,126	0,036
Skewness	4,295	1,520	0,529	-0,740	-1,391	-0,020	0,238	0,110
Kurtosis	24,755	5,521	2,376	2,658	3,500	2,460	2,552	3,018

SOURCE: Authors' calculations

Note: Values of FDI, FP, GDP are given per capita.

[6] *HHILIB* is obtained by multiplying HHI and *LIB*.

Data used in empirical analysis are obtained from various sources. Gross written premium, loss, expense, and foreign companies' market share data for each market are obtained from individual countries' regulatory bodies and national insurance associations. Inflation rate, population and GDP data are obtained from European Bank for Research and Development (EBRD) economic statistics and forecasts published for each year in *Transition Report*. Population data for countries of ex-Yugoslavia are obtained from individual countries' statistical offices, except for Bosnia and Herzegovina, the only country that hadn't census since 1991, which is outdated, thus we use EBRD's estimates of total population excluding refugees abroad. Adult literacy rate data are obtained from United Nations Development Programme (UNDP) Human Development Reports for various years while gross enrollment ratio data are obtained from United Nations Educational, Scientific and Cultural Organization's (UNESCO) Institute for Statistics. Long term interest rate data are obtained from United Nations Economic Commission for Europe (UNECE) Statistical Division Database. Index of economic freedom data, that depicts barriers to entry, is obtained from The Heritage Foundation. Finally, exchange rate of national currencies against the euro for ex-Yugoslavia countries are obtained from individual countries' central banks. Foreign direct investment (FDI) data are obtained from UNCTAD's *Country Fact Sheets*. All monetary values have been denominated to end of 2009 euro value and adjusted for inflation by authors.

Given the cross-sectional and time-series data, to specify the model we observe logarithm of foreign premium as a dependent variable, while the independent variables are market concentration and liberalisation. The model is further augmented by the following explanatory variables: GDP per capita, FDI per capita (both in log form), human capital index, profitability and return on investment.

Six dummy variables for each year shall be introduced in the model for dealing with time effects directly (variable y_{04} takes value 1 for each country in 2004. and 0 otherwise).
We start with testing whether variation of foreign premium is significant between countries. H_0: $\mu_i=0$, that is $\sigma_\mu^2 = 0$ against the alternative H_1 that individual effects do exist.

Both F-test and Welch test suggest we accept the alternative hypothesis that claims the existence of individual effects. We use the same test for testing time effects, that is heterogeneity of the observed variable in time:

TABLE 2: Anova F statistics (individual effects)

Method	df	Value	Probability
Anova F-test	(14, 75)	12	0.0000
Welch F-test*	(14, 28,12)	136	0.0000

SOURCE: Author

F-test is insignificant at 5 percent level, suggesting we should accept the H_0 that time effects do not exist.

We further analyse whether the observed individual effects in the model should be specified as fixed or stochastic. We first estimate the model with stochastic effects, in order to apply Hausman test for correlated random effects:

TABLE 3: Correlated Random Effects - Hausman Test

Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi. d.f.	Prob.
Cross-section random	17,20	7	0,0162

SOURCE: Author

There is strong evidence in support of H_1 hypothesis that individual random effect model is not appropriate, therefore we adopt model with country specific fixed effects. All time dummy variables except y_{05} are found to be insignificant; therefore, we shall estimate the model with specific fixed effects and a single dummy y_{05}.

The general equation to be estimated is:

$$y_{it} = \alpha_i + \boldsymbol{x}_{it}\beta + u_{it},$$

where y_{it} is a scalar dependent variable, in other words, foreign premium per cap. In log form, $\boldsymbol{x}_{it}$ is a $K\times1$ vector of independent variables, u_{it} is a scalar disturbance term, *i* indexes country in a cross section, and *t* indexes time measured in years.Our model incorporates White's consistent covariance matrix (White, 1980), for dealing with heteroskedasticity.

IV. EMPIRICAL RESULTS

The model used in this study has been introduced at the end of previous chapter. In this section, we present original results and interpretations concerning the model observed. The results of the empirical analysis are presented in Table 4 and Table 5.

TABLE 4: Parameter estimates from *Model*

Dependent Variable: LOG(FP)

Method: Panel Least Squares

Sample: 2004 2009

Cross-sections included: 15

Total panel (unbalanced) observations: 88

White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C*	-13,956	2,655	-5,257	0,000
LOG(FDI)	0,034	0,030	1,153	0,253
LOG(ID)*	1,781	0,137	13,026	0,000
HCI	-0,984	2,340	-0,421	0,675
HHI*	-6,900	3,334	-2,069	0,043
LIB**	0,044	0,023	1,921	0,059
HHILIB*	0,112	0,055	2,038	0,046
PR	-0,729	0,746	-0,978	0,332
ROI***	1,520	0,887	1,714	0,091
Y_{05}*	0,121	0,045	2,695	0,009

TABLE 4: Parameter estimates from *Model - continued*

R-squared	0,888	Mean dependent var	4,016
Adjusted R-squared	0,848	S.D. dependent var	1,003
S.E. of regression	0,391	Akaike info criterion	1,185
Sum squared resid	9,766	Schwarz criterion	1,861
Log likelihood	-28,135	F-statistic	222,160
Durbin-Watson stat	1,169	Prob(F-statistic)	0,000

Note:*, ** and *** denote significance at 1 percent, 5 percent and 10 percent level respectively.

SOURCE: Author

TABLE 5: Cross-section fixed effects

Country	Effect
Bosnia	1,143
Bulgaria	1,018
Czech R.	-0,393
Croatia	0,732
Hungary	-0,045
FYRM	1,038
Poland	0,431
Romania	0,703
Slovakia	-1,160
Slovenia	-1,895
Serbia	1,144
Montenegro	1,074
Latvia	-0,544
Lithuania	-1,518
Estonia	-1,865

SOURCE: Author

The results suggest that five explanatory variables influence observed market attractiveness.

Insurance demand (*ID*) is positive and significant at 1 percent. This means that with 1 percent increase in GDP per capita, premium written by foreign insurers would increase roughly by 1.78 percent. This result is consistent with previous studies that suggest that with the increase of insurance demand the market becomes more attractive for foreign insurers' participation (for example, Moshirian, 1999, 2004; Ma and Pope, 2003; Outreville, 2008).

Market concentration (*HHI*) is found to be significant at 1 percent level and has a negative sign as expected. Entry barriers (*LIB*) are significant at 5 percent level and have positive effect on market attractiveness. Additionally, interaction term *HHILIB* is found to be positive and significant at 1 percent level. Therefore, in market that is more concentrated dominant insurers may restrain foreign competitors' entry. However, the negative impact of high market concentration is mitigated by strong positive impact of the interaction term of market concentration with the degree of easiness for foreign competitors to enter the market. These results are consistent with previous studies S-C-P hypothesis (for example, Ma and Pope,

2003; Njegomir and Stojic, 2011).

Return on investment (*ROI*) has statistically significant influence on market attractiveness at 10 percent. The impact of ROI is found to be positive, as expected.

Model was tested on all dummy variables. However, none of the dummy variables representing each year was significant except the Y_{05} representing the year 2005 and therefore we only leave the later in the final model. It is found that this variable has a positive impact. The significance of the year 2005 may be explained with the fact that eight of the observed countries (Slovenia, Hungary, Slovakia, Czech Republic, Poland, Lithuania, Latvia and Estonia) joined the European Union on May 2004 and the fact that in some of the remaining countries insurance laws have been changed (for example, Serbia and Croatia).

Underwriting profitability (*PR*), foreign direct investments (*FDI*) and human capital (*HCI*) are found to be insignificant.

V. CONCLUSION

This research study examines factors affecting attractiveness of Eastern European non-life insurance market for foreign insurers for the period 2004-2009. The region encompasses non-life insurance industries in 15 countries: Bosnia and Herzegovina, Croatia, FYR Macedonia, Montenegro, Serbia, Slovenia, Hungary, Czech Republic, Slovakia, Romania, Bulgaria, Poland, Lithuania, Latvia and Estonia. The research results indicate that the main forces affecting market attractiveness are insurance demand, entry barriers, market concentration and the return on investment. As expected, only market concentration has negative impact.

These results are important for local governments that wish to increase domestic non-life insurance market competitiveness and capacity, achieve foreign investments inflows and more affordable and available insurance for all. Foreign insurers bring not only additional insurance coverage capacity but also expertise in underwriting, claims handling, loss adjusting, marketing and investments, which could facilitate not only coverage of large risks but also increase in the amount of insurance premium per capita and the volume of invested assets in capital markets. Generally, local governments may use competitive and liberalising policies that could promote or restrain foreign insurers' entry. These findings could improve the policymakers' knowledge on how government policies should be targeted in order to increase or decrease foreign companies' participation. Additionally, research results could provide foreign insurance companies an invaluable insight in the characteristics of non-life insurance markets across Eastern Europe and facilitate their decisions whether to participate or not. The results are useful for both foreign and national insurers to anticipate consequences of possible changes in government policies that will aim to decrease or further increase foreign insurers' presence.

Possible limitation of the research results could be the absence of information costs, omitted due to the lack of relevant data, usually measured by geographic and cultural distance between host and home country. Further research should focus on the overcoming of the above-mentioned limitation.

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ODREDNICE TRŽIŠNE ATRAKTIVNOSTI NEŽIVOTNIH OSIGURANJA ZA STRANA ULAGANJA: ISTOČNOEUROPSKA SITUACIJA

SAŽETAK

Cilj ovog rada je istražiti faktore koji utječu na atraktivnost tržišta neživotnih osiguranja za strane osiguravatelje u Istočnoj Europi. Koristili smo modele efekata specifičnih za pojedine zemlje za dobivanje panelnih podataka koji pokrivaju petnaest zemalja u periodu od 2004-2009, omogućavajući svakoj međusektorskoj jedinici različit presječni član u svrhu neuočene slučajne varijable koja je potencijalno korelirana s uočenim regresorima. Rezultati istraživanja ukazuju na to da glavni utjecaj na atraktivnost tržišta imaju potražnja za osiguranjem, ulazne barijere, koncentracija tržišta i zarada od investicije. Rezultati bi mogli biti vrlo značajni za lokalne uprave te strane i domaće osiguravatelje.

Ključne riječi: *globalizacija, neživotna osiguranja, atraktivnost tržišta, istočna Europa*.

BUSINESS TOURISM DESTINATION COMPETITIVENESS: A CASE OF VOJVODINA PROVINCE (SERBIA)

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ABSTRACT

The main purpose of this article is to create model of business tourism destination competitiveness and test it on the example of Vojvodina Province, tourist cluster in Serbia, where business tourism is defined as one of key tourist products. The paper aims to examine in which areas Vojvodina Province is more competitive as a business tourism destination and where it is less competitive compared to "competitive set" of three chosen destinations. Also, this paper aims to test relationships between destination competitiveness determinants in order to determine the weakest point of Vojvodina Province business tourism competitiveness, and specifically the position of destination management. The study results indicate that two determinants: destination management and destination policy, planning and development are the weakest points of Vojvodina Province competitiveness, while highest ratings are assigned to core resources and attractors determinant. The results will be most valuable in assisting destination management organizations, tourism policy creators and tourism practitioners to better understand identified destination advantages and problems in business tourism and general tourism development in Vojvodina Province, and to formulate strategies to effectively manage destination disadvantages.

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I. INTRODUCTION

The number of tourism destinations worldwide is constantly growing. As destinations strive for bigger market shares, there is great competition on the international tourism market. Competitiveness is increasingly being seen as a critical influence on the performance of tourism destinations in competitive world markets (Enright, Newton, 2005).

Crouch and Ritchie (2000, p.6) stated that tourism destination competitiveness "has tremendous ramifications for the tourism industry, and is therefore of considerable interest to practitioners and policy makers." Moreover, Enright and Newton (2005, p.340) stated that "a destination is competitive if it can attract and satisfy potential tourists, and this competitiveness is determined by both tourism specific factors and a much wider range of factors that influence the tourism service providers."

In tourism industry, competition among territorial areas is usually not centred on the single aspects of the tourist product (environmental resources, transportation, tourism services, hospitality, etc.), but on the tourist destination as an integrated set of facilities for the tourist (Buhalis, 2000; Ritchie & Crouch, 2000). In an ever more saturated market, the fundamental task of destination management is to understand how tourism destination competitiveness can be enhanced and sustained. There is thus a strong need to identify and explore competitive (dis)advantages and to analyze the actual competitive position (Gomezelj, Mihaljič, 2008). Identifying competitors and determining the destination advantages and disadvantages relative to competitors is an integral part of successful marketing management of tourist destinations.

During the past couple of decades, the research body on tourism destination competitiveness has grown. General models of destination competitiveness have been developed with an extensive list of determinants and attributes. But although the list is extensive, they are unlikely all to be of equal importance or influence in determining the competitiveness of destinations. A destination should therefore be wise to focus attention on those attributes that are likely to have the greatest beneficial impact to particular segments of the tourism market (Crouch, 2010).

Business travellers represent growing segment of the international tourism market and business tourism is considered as one of most desirable forms of tourism development at destinations worldwide. According to WTO (2007), business tourism is high quality and high yield, can be positioned as a key part of an economic development strategy and the sector is resilient to the types of events and economic downturns that affect leisure tourism. Therefore, the number of destinations that recognized benefits of business tourism development is constantly increasing, thus, the competition is more intensive now than it used to be.

Tourism industry in Serbia and countries in the region (Hungary, Croatia, Slovenia and Romania) show great interest in business tourism development. These countries continuously put new venues and facilities on the market and compete in attracting international business events. The Vojvodina Province, as one of four tourist clusters in Serbia, represents an attractive location for holding business events and has a long tradition of organizing fairs and congresses. Different strategic and planning documents recognized tourism as an activity that could stimulate whole economy development through jobs creation, investments in

(tourism) infrastructure and tourism complementary activities. Moreover, business tourism is considered as one of quick-win tourist products in Vojvodina, as well as in whole Serbia, which could improve destination image and provide competitive position in short time on the international tourism market. However, there are no studies about tourism, and specifically business tourism competitiveness of Vojvodina Province.

The main purpose of this article is to create and test model of business tourism destination competitiveness, which will include general tourism-related factors and specific business tourism factors that affect destination competitiveness. Different hypotheses are created to determine in which areas Vojvodina Province is more competitive as a business tourism destination and where it is less competitive. It is aim to deal with the following research questions:

1. What is the weakest point in Vojvodina Province business tourism competitiveness?
2. What is the position of tourism management?

The article is divided into six sections. The paper starts with the theory on tourism destination competitiveness and business tourism. The methodology used is presented in section four, which is followed by research results in section five. Section six includes conclusions, limitations of the research, and future research directions.

II. THEORY ON TOURISM DESTINATION COMPETITIVENESS

As a concept in business, management and international trade, competitiveness has received widespread interest and attention (Ritchie and Crouch, 2003). Attempts to conceptualize and analyze competitiveness have come from a variety of different academic disciplines, including economics, management, politics and culture, each with its own perspective on the subject.

Scott and Lodge (1985, p.3) viewed national competitiveness as "a country's ability to create, produce, distribute, and service products in international trade while earning rising returns on its resources". They also noted that this ability "is more and more a matter of strategies, and less and less a product of natural endowments". The Organization for Economic Cooperation & Development (OECD) *(The World Competitiveness Report*, 1994) defines competitiveness as "the ability of a country or company to, proportionally, generates more wealth than its competitors in world markets". Competitiveness is viewed as combining both assets and processes where assets are inherited (e.g., natural resources) or created (e.g., infrastructure) and processes transform assets into economic results (e.g., manufacturing).

Ritchie and Crouch (2000) viewed a destination's competitiveness as a country's ability to create added value and thus increase the national wealth by managing assets and processes, attractiveness, aggressiveness and proximity, and there by integrating these relationships within an economic and social model that takes into account a destination's natural capital and its preservation for future generations (Ritchie and Crouch, 2003).

Hong (2008, p.6) defines tourism competitiveness as the ability of a destination to create, integrate and deliver tourism experiences, including value-added goods and services considered

to be important by tourists. These experiences sustain the resources of a destination, and help it maintain a good market position relative to other destinations.

Competitiveness has been associated in the tourism literature as a crucial factor for the success of tourist destinations (Kozak and Rimmington, 1999; Crouch and Ritchie, 1999; Mihalic, 2000; Buhalis, 2000; Dwyer and Kim, 2003; Gooroochurn and Sugiyarto, 2005; Enright and Newton, 2004; Mangion et al., 2005; Mazanec et al., 2007; Chen, 2008). Tourism studies, in general, seem to imply that by being competitive a tourist destination could expand its tourism industry and hence the quality of life of the populace (Crouch and Ritchie, 1999; Dwyer and Kim, 2003; Sahli, 2006; Kim et al., 2006).

A number of authors have provided some inputs into the understanding and practical research of competitiveness in tourism destinations (De Keyser and Vanhove, 1994; Evans, Fox and Johnson, 1995; Faulkner et al., 1999; Hassan, 2000; Ritchie and Crouch, 1993; Crouch and Ritchie, 1999; Crouch and Ritchie, 2000; Ritchie and Crouch, 2003; Dwyer et al., 2000, 2002; Enright and Newton, 2004, 2005; Bonn et al., 2005; Cracolici and Nijkamp, 2008; Crouch, 2010; Miller et al., 2008; Dragićević et al., 2009). But, there seems to be no generally accepted definition of competitiveness and the means to measure it (Croes 2005; Papatheodorou and Song 2005, Gomezelj and Mihalič, 2008).

In order to measure competitiveness of the destination, different models were created. These models differ by the elements (indicators) which are used to measure the competitiveness.

Well known Porter's (1990) "diamond of national competitiveness" includes aspects of both the multidimensional strand of economics together with an emphasis on the management and strategy field, focuses not on the competition between national economies but rather on the competition between, and competitiveness of, specific industries in different locations. This four-part framework, which was based on research undertaken in eight advanced and two newly industrialized countries, postulates that success in international competition in a given industry depends on the relative strength of an economy in a set of business-related features or "drivers" of competitiveness, namely, factor conditions, demand conditions, related and supporting industries, and firm strategy, structure, and rivalry specifically related to the industry (Enright and Newton, 2005). This approach found its application in measuring tourism destination competitiveness. De Holan and Phillips (1997, p.781) explicitly recommend the inclusion of Porter's framework, particularly when examining tourism in developing countries.

The authors De Keyser and Vanhove in their competitiveness model (1994) argue that the analysis of a competitive position should take five groups of competitiveness factors into account: tourism policy, macroeconomic, supply, transport and demand factors. This model was used by Sirše and Mihalič (1999) in measuring Slovenian tourism competitiveness.

Mihalič (2000) studied destination competitiveness from environmental perspective. The environmental component was also considered in Hassan's model (2000). The model defined a destination's commitment to the environment as one of the four determinants of tourism competitiveness; and included also comparative advantage, industry structure and demand factors (Gomezelj and Mihalič, 2008).

Dwyer et al. (2003) tested Integrated model of destination competitiveness on the cases of Korea and Australia and in 2004 its methodology was applied to evaluate the tourism

competitiveness of Slovenia (Gomezelj and Mihalič, 2008). The Integrated model defines six main determinants of competitiveness: inherited resources, created resources, supporting factors and resources, destination management, situational conditions and demand conditions. Inherited, created and supporting resources encompass the various characteristics of a destination that make it attractive to visit. Destination management determinant embraces the activities of destination management organisations, destination marketing management, destination policy, planning and development, human resources development and environmental management. This determinant (should) enhance the attractiveness of the inherited and created resources and improve the supporting factors quality. The factors of situational conditions are destination's location, micro and macro environment, security and safety, price competitiveness. These factors can moderate, modify or even mitigate a destination's competitiveness. Demand conditions include awareness, perception and preferences of tourism demand (Kim and Dwyer, 2003).

Well-known tourism competitiveness researchers Ritchie and Crouch (2003) presented the most recently improved version of their competitiveness model: a Conceptual Model of Destination Competitiveness, which is among the best known of recent attempts to conceptualize an approach that includes elements of tourism competitiveness and industry competitiveness and has undergone a number of iterations since its earliest public presentation (Ritchie and Crouch, 1993). Some of the variables identified by Crouch and Ritchie (1999) have been included in the above mentioned Integrated model of destination competitiveness.

Ritchie and Crouch (2003) model includes five key determinants: destination policy, planning and development, qualifying and amplifying determinants, destination management, core resources and attractors, and supporting factors and resources. It also points out the importance of the global macro environment and the competitive microenvironment surrounding the destination. Core resources and attractors are "the fundamental reasons that prospective visitors choose one destination over another" (Crouch and Ritchie, 1999, p.146). This determinant includes physiography (landscape and climate), culture and history, market ties (linkages with the residents of tourism originating regions), activities, special events, and the tourism superstructure (primarily accommodation facilities, food services, transportation facilities, and major attractions). Supporting factors and resources consist of accessibility, entrepreneurship, communications infrastructure, local transportation infrastructure, and other inputs provided by public services, institutions (financial, education, and research), and the principal factors of production. Destination management embraces destination promotion, service levels, information systems, the organization of destination management activities, and sustainable resource stewardship. Qualifying and amplifying determinants include safety, location, interdependencies within and between destinations, and cost (in a broad sense includes interdestination travel, local living costs, and exchange rate effects). Finally, destination policy, planning, and development determinant consists of system definition, philosophy, vision, audit, positioning, development, competitive/collaborative analysis, monitoring, and evaluation.

In this study, the main determinants of Ritchie and Crouch (2003) destination competitiveness model have been kept.

III. BUSINESS TOURISM DESTINATION

In business tourism, the competition among destination is more intensive now than it used to be, as countries worldwide continuously put various meeting venues and facilities on the market. Therefore, in this section of the article, it is necessary to define business tourism as a type of tourism, and, moreover, variables or factors that affect competitiveness of a business tourism destination should be discussed in order to explain development of a model used in this study for measuring business tourism destination competitiveness.

According to WTO (2007, p.18), business tourism is seen as "a travel to attend an activity or event associated with business interest". Main components of business tourism are: meetings, incentives, conventions and exhibitions. Similar to WTO (2007), Davidson and Cope (2003) grouped four sectors: meetings, incentive trips, exhibitions and corporate hospitality, as business tourism. Davidson (1994) states that business tourism is concerned with people travelling for purposes related to their work. According to Swarbrook and Horner (2001), business tourism brings great benefits to destinations and has a number of advantages over leisure tourism. Thus, every year, destinations worldwide compete in attracting business events such as conventions, exhibitions, incentive travels.

According to Crouch and Weber (2002), the service provided in a destination and its facilities are critical to the success of the meeting destination. A business tourism destination has to offer a suitable venue for the meeting, sufficient accommodation (if a venue is non-residential), attractions, good accessibility to the generating markets and efficient transport system within the destination (Swarbrooke and Horner, 2001).

Numerous studies have investigated specific destination variables that influence the selection of a destination for holding business events and its competitiveness (Ching-Fu, 2006; Crouch and Ritchie, 1998; DiPietro et al., 2008; Oppermann, 1996; Baloglu and Love, 2001; Crouch and Louviere, 2004; Chacko and Fenich, 2000; Oppermann and Chon, 1997; Yoo and Chon; 2008, Zhang et al., 2007; Kim and Kim, 2003; Qu et al., 2000).

Crouch and Ritchie (1998) grouped 36 destination attributes, that govern a choice of meeting destination, into a set of eight primary categories: accessibility (cost, time, frequency, convenience, and barrier attributes), local support (local chapter, convention and visitors' bureau/convention center, and subsidies attributes), extra conference opportunity (such as entertainment, shopping, sightseeing, recreation, and professional opportunities), accommodation facilities (capacity, cost, service, security and availability), meeting facilities (capacity, layout, cost, ambiance, security, availability and experience attributes), information (reputation and marketing attributes), site environment (including climate, setting, and infrastructure attributes) and other criteria (such as risks, profitability, association promotion and novelty attributes). In a study of the competitiveness of Hong Kong as an international conference destination in South-east Asia, Qu et al. (2000) concluded that accommodation, convention facilities, accessibility, safety and infrastructure system were perceived as important site selection criteria. In the analysis of Seoul as an international convention destination, Kim and Kim (2003) state that meeting room facilities, service quality, restaurants, transportation and destination attractiveness are the major attributes for choosing one destination for holding business events. According to Crouch and Weber (2002), although

the literature has highlighted the importance of the available meeting and accommodation facilities, it is clear that a number of additional destination attributes (such as accessibility of the congress site to the majority of attendees, attractive pre and post congress recreational or vacationing opportunities, appealing destination image) play critical roles in destination selection process. Chacko and Fenich (2000, p. 218) state that "the promotional appeal of a site is a vital contributor to overall convention destination attractiveness". In study on convention site selection in Australia, Crouch and Louviere (2004) concluded that convention and accommodation facilities are critical, but one destination must offer additional attributes to succeed in an ever more competitive environment. "Destinations need to create unique combinations of attributes to develop strong competitive positions" (Crouch and Louviere, 2004, p.128), using knowledge of the factors that meeting planners and buyers value most in their site choice decisions.

IV. METHODOLOGY

The model on measuring business tourism destination competitiveness was created based on the above mentioned Ritchie and Crouch (2003) Conceptual Model of Destination Competitiveness and a set of factors that affect destination (site) selection for holding business events. The main determinants of Ritchie and Crouch (2003) model are kept, with general tourism destination attributes which were adapted to Vojvodina Province tourism characteristics. Specific business tourism factors that affect destination competitiveness were added after literature review presented in the section 3 of the article. The model resulted in 54 destination attributes which were grouped into each of five determinants of Ritchie and Crouch (2003) model: core resources and attractors (including 17 attributes), supporting factors and resources (including 5 attributes), qualifying and amplifying determinants (including 10 attributes), destination management (12 attributes) and destination policy, planning and development determinant (10 attributes).

As given destination is competitive or uncompetitive against relevant competing destinations, it is important to establish which destinations comprise the competitive set (Kozak and Rimmington, 1999). In literature, the competitive set is usually comprised of three to five destinations (Enright and Newton, 2004, 2005; Gomezelj and Mihalič, 2008; Crouch, 2010). Therefore, in this study the respondents were asked to indicate major three competitor destinations of Vojvodina Province. The majority of respondents (52.5%) established a competitive set comprising of Hungary, Croatia and Slovenia. According to 14.4% of respondents, the major competitors of Vojvodina Province business tourism are Hungary, Croatia and Belgrade tourist cluster (Serbia).

In the second stage, the respondents were asked to evaluate Vojvodina Province competitive performance on a five-point Likert scale, ranging from 1 (*well below the same level in competitive destinations*) to 5 (*well above the same level in competitive destinations*), for each of the 54 attributes compared to its competitor destinations, in order to indicate the weakest points in Vojvodina Province business tourism.

The survey was conducted in 2010. The survey questionnaire was distributed by e-mail to travel industry practitioners and tourism stakeholders on the supply side (tourism industry,

government, tourism school academics and postgraduate students on tourism management courses). "It is a common practice in research in the generic management field, including competitiveness research, for the survey population to be managers and other industry practitioners, as this is the population seen to be the most knowledgeable about management and competitiveness" (Enright and Newton, 2005, p.343). Although tourists are able to evaluate a destination's attractiveness, they are less able to evaluate factors such as destination management or destination policy. Formica (2002) discusses that both experts' and tourists' evaluations of destination competitiveness could have the highest degree of accuracy. However, the literature supports targeting industry practitioners in measuring destination competitiveness (Faulkner et al., 1999; Gomezelj and Mihalič, 2008; Enright and Newton, 2004, 2005; Crouch, 2010). From the 358 questionnaires sent out, 118 were completed in a correct way. The SPSS standard package version 17 for personal computers was used for data processing.

V. STUDY RESULTS

A. Sample characteristics

According to gender, 60.2% respondents were female and 39.8% male. The majority of respondents were young, up to 35 years (67.8%), followed by 20.3% in the age group between 36 and 50 years, while the respondents with more than 50 years represented 11.9% of the sample. All of respondents had completed university levels of education. Of 118 respondents, 13.6% were government officials, 5.9% were employers in local tourist organisations, 4.2% employers in congress bureau and congress centres. The largest response rate was from tourism academics (39% of the sample) and postgraduate students on tourism management courses (22.9%). Also, the sample included tourist agency managers (5.1% of the respondents) and hospitality sector managers (4.2%), while 5.1% were represented by others. The sample consisted of 60.2% of respondents who had been linked with the tourism industry for up to 5 years, 22.9% of them from 6 to 10 years and 16.9% for more than 10 years.

B. Competitiveness by destination determinants

As above mentioned, individual destination attributes of Vojvodina Province are grouped into the five main determinants of Ritchie and Crouch (2003) Conceptual Model of Destination Competitiveness. Thus, the competitiveness of individual destination attributes is analysed by each competitiveness determinant, in order to evaluate the weakest, as well as the strongest attributes of Vojvodina Province tourism.

Core resources and attractors. As figure 1 show, the highest rating was assigned to the following destination attributes: multicultural ambience, gastronomy offer, entertainment, festival and events and the attractiveness of cultural heritage. This was expected as Vojvodina Province is one of the most heterogeneous regions in Europe considering ethnic structure. Different ethnic groups living in the region have preserved its tradition, customs, and gastronomy and presented it on tourist market mostly in the form of different festivals. The smallest standard deviation for multicultural ambience (σ=0.72) and gastronomy offer

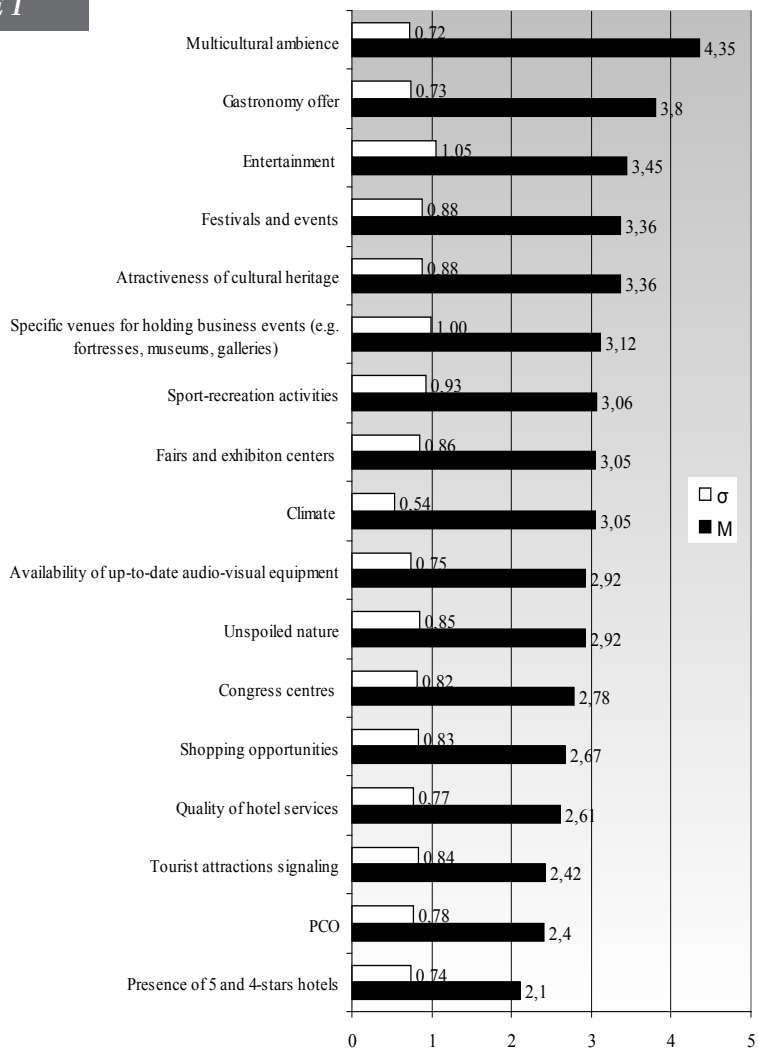
(σ=0.73) indicates quite a high level of agreement between the respondents. Also, among all 54 attributes, the respondents assigned the highest rating to these two attributes, which therefore represent the primary attractors of Vojvodina Province. In the context of business tourism development, multicultural ambience and rich gastronomy offer contribute to destination attractiveness, which is important (sometimes prevailing) element in the bid process, when choosing destination for a congress or a conference. Also, these attributes could be important segments of incentive travel arrangements. Presence of five and four star hotels, as well as of professional congress organizers (PCO), signalling on roads related to tourist attractions, quality of hotel services, shopping opportunities and congress centres are all rated relatively low.

Supporting factors and resources. Only one out of the five supporting factors, hospitality of local residents, is rated as being more competitive in comparison to the chosen set of three competitive destinations. Accessibility of destination is not seen as advantage or disadvantage of Vojvodina Province tourism industry as it is "at the same level" (M=3) as at competitors. Although strategic documents on tourism development highlight valuable economic and social contribution made to society by tourism industry, political will and incentives for tourism development in Vojvodina Province are rated low (M=2.36). Presence of foreign/international companies on business tourism destination is important competitiveness indicator in terms of holding corporate business events and organizing incentive trips. This attribute, as well as quality of local transportation services are rated as being less competitive in comparison to the chosen set of competitive destinations.

Qualifying and amplifying determinants are "factors of competitiveness that moderate, modify, mitigate and filter, or magnify, strengthen, enhance and augment the impact of all other determinants" (Ritchie and Crouch, 2003, p.233). Compared to its competitive destinations, Vojvodina Province is regarded as being more competitive than its competitors in only four out of 10 attributes: location, transport and hotel services costs and destination safety. As business events are usually attend by intellectual and business elite, as well as representatives of local/national authorities, safety issue is important indicator of business tourism destination competitiveness. According to respondents, Vojvodina Province is perceived as a safe destination. However, low ratings given for overall destination image, political stability, value for money, destination cleanliness, economic stability and on-line booking of accommodation should alarm tourism stakeholders as well as destination management organization and government.

MEAN VALUES (M) AND STANDARD DEVIATIONS (Σ) FOR INDIVIDUAL ATTRIBUTES OF CORE RESOURCES AND ATTRACTORS DETERMINANT

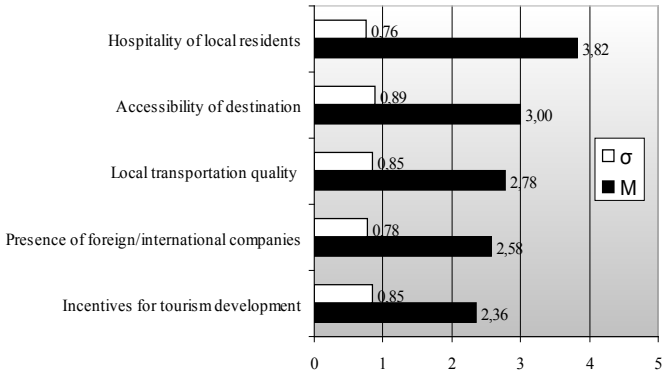
FIGURE 1



SOURCE: Author

MEAN VALUES (M) AND STANDARD DEVIATIONS (Σ) FOR INDIVIDUAL ATTRIBUTES OF SUPPORTING FACTORS AND RESOURCES DETERMINANT

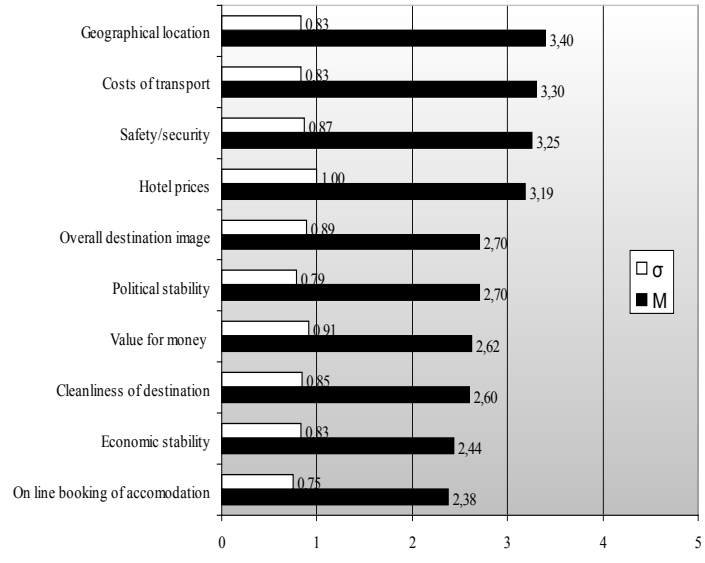
FIGURE 2



SOURCE: Author

MEAN VALUES (M) AND STANDARD DEVIATIONS (Σ) FOR INDIVIDUAL ATTRIBUTES OF QUALIFYING AND AMPLIFYING DETERMINANTS

FIGURE 3

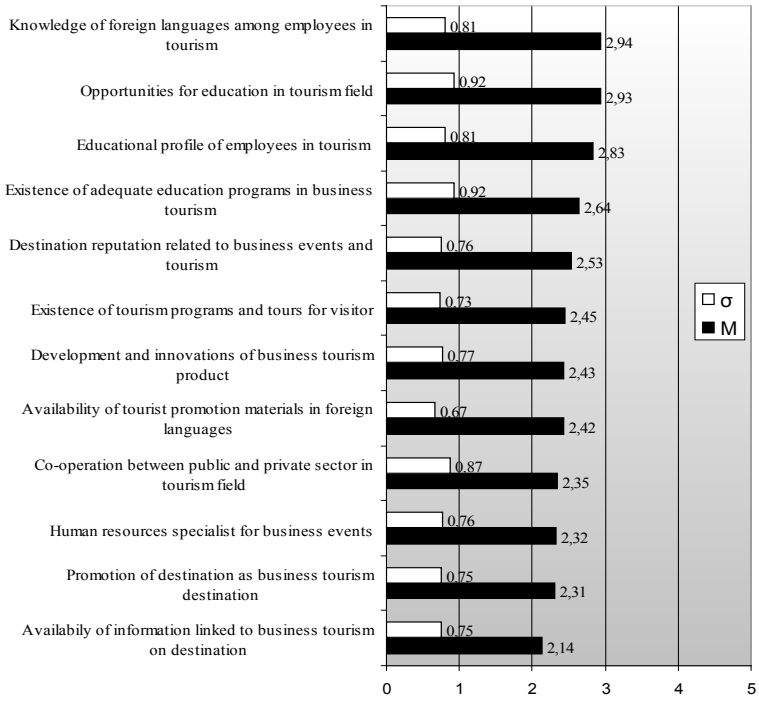


SOURCE: Author

Destination management. Considering ratings given for destination management factors, Vojvodina Province is less competitive in all factors compared to competitive set of destinations (Fig. 4). Also, low standard deviation for almost all factors indicates a high level of agreement among respondents in ratings of this determinant.

MEAN VALUES (M) AND STANDARD DEVIATIONS (Σ) FOR INDIVIDUAL ATTRIBUTES OF DESTINATION MANAGEMENT

FIGURE 4



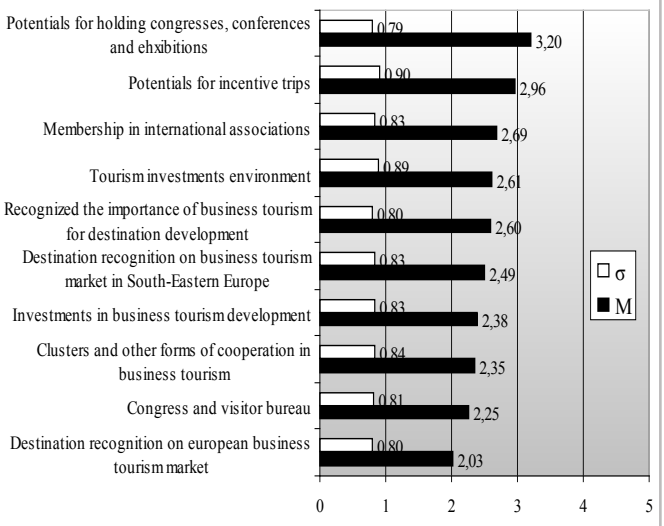
SOURCE: Author

Destination policy, planning and development determinant is closely connected to destination management determinant. Thus, low ratings for this determinant attributes were expected. Only one attribute – potentials for holding congresses, conferences and exhibitions was given higher rating compared to Vojvodina Province competitors. This may be expected as Novi Sad, administrative centre of Vojvodina Province, has long tradition (almost one century) in organizing fairs, of which some are UFI (*Union of International Fairs)* approved events. Other destination attribute are not competitive. Destination recognition on European business tourism market and in the region, congress and visitor bureau services, clusters and other forms of cooperation in business tourism, as well as the investments in business tourism development are all rated relatively low compared to Vojvodina Province competitors. Also, tourism investments environment and membership in international associations, which is of great importance in bidding process, when members of an international association act as

destination "ambassadors", trying to make one destination as attractive as possible for holding congress, are rated low compared to Vojvodina Province competitors. Business tourism is defined in Serbian and Vojvodina Province strategic tourism related documents as one of quick win tourist products. Therefore, low ratings for the above mentioned destination attributes should alarm all stakeholders interested in business tourism development in Vojvodina Province and should stimulate them to work together in order to provide better performance of Vojvodina Province at least on South-East European business tourism market.

MEAN VALUES (M) AND STANDARD DEVIATIONS (Σ) FOR INDIVIDUAL ATTRIBUTES OF DESTINATION POLICY, PLANNING AND DEVELOPMENT DETERMINANT

FIGURE 5



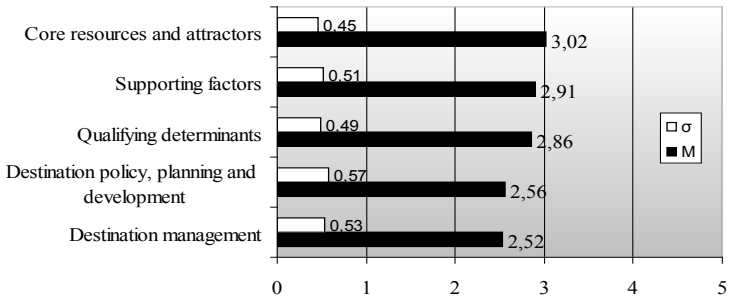
SOURCE: Author

In order to determine the weakest point of Vojvodina Province business tourism, mean values and standard deviations were calculated for each of the competitiveness determinants (Fig. 6). The highest rating was assigned to the core resources and attractors determinant, as expected. However, mean value of this determinant shows that destination attractiveness is not enough to provide competitive position of Vojvodina Province business tourism in the region. Other competitiveness determinants values were quite low. As it was expected, the weakest point in Vojvodina Province business tourism competitiveness is destination management, followed by destination policy, planning and development. The low standard deviations for all competitiveness determinants indicate a high level of agreement in respondents' opinions. Overall, the conclusion can be drawn that Vojvodina Province is not competitive business tourism destination compared to chosen set of competitive destinations. However, as Gomezelj and Mihaljič (2008, p. 294) state, "competitiveness can be improved through

appropriate matches between tourism resources and management strategies supported by tourism stakeholders".

MEAN VALUES (M) AND STANDARD DEVIATIONS (Σ) FOR COMPETITIVENESS DETERMINANTS

FIGURE 6



SOURCE: Author

C. Results of t-tests (Paired Samples)

In order to study the competitiveness of destination management determinant, different hypotheses were created and Paired-Samples T test was used to test them.

The main hypothesis claims that destination management is the weakest determinant in Vojvodina Province business tourism competitiveness. In order to test it, four sub-hypotheses were created. The first sub-hypothesis assumes that Vojvodina Province business tourism is less competitive in management than in destination policy, planning and development. The second sub-hypothesis refers to management and qualifying and amplifying determinants and claims that management is again the weakest point of Vojvodina Province business tourism competitiveness. The third sub-hypothesis claims that Vojvodina Province is less competitive in destination management than in supporting factors, and the last sub-hypothesis refers to destination management and core resources and attractors.

TABLE 1. Results of Paired-Samples T test (testing of competitiveness hypotheses)

	Paired Variables	Paired Differences: Mean	Std. Deviation	99% Confidence Interval of the Difference: Lower	Upper	t	Sig. (2-tailed)
Pair 1	Destination management – Destination policy	-0.03192	0.32917	-0.11127	0.04743	-1.053	0.294
Pair 2	Destination management - Qualifying determinants	-0.33446	0.42340	-0.43653	-0.23240	-8.581	0.000
Pair 3	Destination management - Supporting factors	-0.38277	0.38887	-0.47651	-0.28903	-10.692	0.000
Pair 4	Destination management – Core resources	-0.49517	0.41335	-0.59481	-0.39553	-13.013	0.000

SOURCE: Author

The results in Table 1 indicate no statistically significant differences between destination management determinant and destination policy, planning and development determinant (p=0.294; t=-1.053). Therefore, the first sub-hypothesis was rejected at 0.01 level. The lowest mean values were assigned to the above mentioned determinants (for destination management determinant M=2.52, and for destination policy, planning and development determinant M=2.56) with high level of agreement among respondents. Therefore, the conclusion can be drawn that these two determinants represent the weakest points of business tourism in Vojvodina Province. These results are in line with those presented in the Marketing strategy of Vojvodina Province tourism development (2009), as well as with the Serbian Strategy of tourism development (2005-2015).

Regarding the second sub-hypothesis, the results in Table 1 show that there is a statistically significant difference between destination management and qualifying determinants at 0.01 level (p=0.000; t=-8.581). In other words, qualifying determinants more strongly support Vojvodina Province business tourism competitiveness than destination management. Also, Vojvodina Province is more competitive in supporting factors determinant and less in destination management and this was statistically proven (p=0.000; t=-10.692). As expected, core resources turned out to be a stronger competitiveness determinant in the pair with destination management. Overall, it can be concluded that destination management determinant is the weakest point of Vojvodina Province business tourism, together with destination policy, planning and development determinant. These findings are in line with national and provincial strategic tourism related documents, which emphasis the problems linked to destination management and tourism policy.

VI. CONCLUSIONS

This study assessed the model of business tourism destination competitiveness and has advanced Crouch and Ritchie's 2003 Model of Destination Competitiveness in (business) tourism-specific competitiveness research. The created model was used to evaluate the competitiveness of Vojvodina Province business tourism. The results showed that Vojvodina Province is not competitive business tourism destination compared to chosen set of competitive destinations. Among five competitiveness determinants, tourism practitioners assigned the highest rating to core resources and attractors determinant ("at the same level in competitive destinations"), while other determinants were rated below the same level in competitive destinations. However, the results of individual attributes by determinants showed that Vojvodina Province is, compared to its competitors, more competitive in some of its core resources and attractors (multicultural ambience, gastronomy offer, entertainment, festival and events and cultural heritage attractiveness), as well as in some of supporting factors (hospitality of local residents) and qualifying and amplifying determinants (location, transport and hotel services costs and safety). These attributes make one destination more attractive for visiting or holding a business event and therefore, they should be in focus of Vojvodina Province marketing activities. The results of t-tests (paired samples) showed that two determinants: destination management and destination policy, planning and development, are the weakest points of Vojvodina Province business tourism competitiveness. It was statistically proven ($p<0.01$) that qualifying and amplifying determinants, supporting factors and core resources and attractors more strongly support Vojvodina Province business tourism competitiveness than destination management. Thus, it can be concluded that Vojvodina Province might become competitive business tourism destination in the region. It will require many improvements, specifically in the filed of promotion, destination image, tourism related and business tourism specialized human resources, investment environment and business tourism product planning and development.

Although this study provide a basis for overcoming identified disadvantages in Vojvodina Province tourism and specifically business tourism, it is limited by several factors that should be addressed in future research. More than 60% of the sample is represented by tourism academics and postgraduate students, while the rest of the sample consists of tourism stakeholders, congress bureau and other destination management organizations. Future researchers may focus their efforts on obtaining a larger number of respondents – tourism stakeholders, not academics. Also, to gain a better overview of Vojvodina Province business tourism competitiveness, future studies may expand the sample to include business events planners and professional organizers, as well as business events participants. Research might further compare views of business tourism supply and demand side on Vojvodina Province business tourism competitiveness. Also, the model of business tourism destination competitiveness created in this study, might be tested in other business tourism destinations, specifically in destinations identified as Vojvodina Province's primary competitors (Hungary, Slovenia and Croatia) and further comparison among destination competitiveness results could be done in order to get more general conclusions. Despite these limitations, the results of this study offer useful findings and pose some valuable managerial implications and directions for further research.

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POSLOVNA KONKURENTNOST TURISTIČKE DESTINACIJE: SLUČAJ REGIJE VOJVODINE (SRBIJA)

SAŽETAK

Svrha ovog rada je kreirati model za mjerenje konkurentnosti destinacije poslovnog turizma i testirati ga na primjeru Vojvodine, turističkog klastera u Srbiji, gdje je poslovni turizam definiran kao jedan od ključnih turističkih proizvoda. Cilj rada je ispitati u kojim područjima je poslovni turizam Vojvodine više, odnosno manje, konkurentan u usporedbi s "konkurentnim setom" koji čine tri odabrane destinacije. Također, cilj rada je testirati veze između determinanti modela konkurentnosti destinacije da bi se odredile najslabije točke poslovnog turizma Vojvodine, a naročito da bi se ustanovila pozicija determinante menadžment destinacije. Rezultati istraživanja pokazuju da su dvije determinante: menadžment destinacije i destinacijska politika, planiranje i razvoj, najslabije determinante konkurentnosti Vojvodine, dok su najveće ocijene dodijeljene determinanti ključni resursi i atrakcije. Rezultati će biti od koristi destinacijskim menadžment organizacijama, kreatorima turističke politike i turističkoj privredi da bolje razumiju identificirane nedostatke i probleme u poslovnom turizmu i općenito turizmu Vojvodine i da formuliraju strategije kojima će se efikasno upravljati destinacijom.

Ključne riječi: *konkurentnost destinacije, poslovni turizam, Vojvodina.*

Innovativeness of European SMEs: Mission not yet accomplished[1]

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ABSTRACT

The paper aims to contribute to the discussion on the catalytic role of SMEs in generating innovation as a basis for a competitive economy. It focuses on six European countries, representing both established and transitional settings (United Kingdom, Cyprus, Spain, Italy, Greece and Lithuania). The statistical methods used included ANCOVA, multiple regression analysis and chi-square tests. The factors explaining the innovation levels were provided. Innovation and corporate culture indices were created and found to be correlated. Four variables were shown to explain innovation management in the six countries: corporate culture, formal processes/innovation department, company size and review of products. The respective SME perceptions, key factors and levels of innovation management were thus differentiated for the six countries. This comprehensive differentiated approach is an innovative contribution to the field.

1 "Errata - final and author approved version of the paper replacing the non approved version of paper published in Vol. 25 No. 1 2012"

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I. INTRODUCTION

In today's globally competitive industry, fresh and original ideas that could generate new technologies, products and services or, even, revolutionize the industry are indispensable stepping stones for economic success, not only for the respective Small and Medium-sized Enterprises (SMEs) but for the European economy as a whole. Accordingly, Jamrog (2006 in Fortuin and Omta, 2009, p.840) points to the "relationship between entrepreneurship, economic growth and poverty reduction". In current research, innovation has been correlated with macro and micro economic objectives such as national or regional competitiveness, profitability and international business success (Geroski et al., 1993; Denton, 1999; Leiponen, 2000; Jones and Tilley, 2003; Lindner, 2006; Franke, 2007). In this context, acronyms like Gold Dust for an efficient economy or backbone and heart of an economy illustratively reflect the significant macro economic contribution of small and medium sized enterprises (SMEs) for economy and society. From a micro perspective, besides the aforementioned profitability increase, Busse and Wallenburg (2011) highlight the contributions of product and service innovation in terms of creating revenues, cost savings and improved processes (Khazanchi et al., 2007, in Busse and Wallenburg, 2011) as well as being a potential source of competitive advantage (Dougherty and Hardy, 1996; McGrath and Ming-Hone, 1996, in Busse and Wallenburg, 2011). Indeed, it is this competitive advantage which will guarantee SMEs' survival as indicated by Christensen (2006) and Elonnen, Blomqvist and Puumalainen (2008) stressing with a sense of urgency that companies will not survive unless they have the ability to continuously renew and innovate. Furthermore, innovation can be seen as a kind of protective shield for SMEs as explained by Nicholas, Ledwith and Perks (2011, p.227): "companies must innovate in order to expand into new markets, to arrest margin erosion and to protect their current market share".

Against this background, it appeared to be an interesting research aim to investigate if different levels and factors of innovation management in SMEs in a variety of European settings exist. The main motivation and focus of this research was to provide differentiated factors that explain innovation management in six European countries in order to inform innovation strategies of both, entrepreneurs and macro decision makers of the European Union (EU). To the knowledge of the authors, no European cross-country research exists in current literature explaining the innovation levels of the respective countries. Innovatively, the research allows also, albeit to a limited extent, for a comparison between 'established' European and 'transitional' European settings. The quantitative methodology applied including descriptive statistics, Chi-square (X^2) tests of independence, Analysis of Covariance (ANCOVA) and multiple regression analysis, has provided the advantage of differentiating the respective SME perceptions, key factors and levels of innovation management. This is a contribution to the field and gives new

insight into the discussion regarding the catalytic role of SMEs in generating innovation as a basis for a competitive economy and the effective interplay between macro decision makers and entrepreneurs. The main more detailed research problems addressed by this research relate to the hypothesized and confirmed lack of entrepreneurial perception of innovation as a strategic, systematic approach, the importance of corporate culture for innovation and still existing external and internal barriers for innovation. The research findings provide a number of suggestions for entrepreneurs, teachers and macro decision makers culminating in the demand for more concerted actions between entrepreneurs, universities and government. The research represents an integral part of the MINT project (2008–2009), which was supported by the LEONARDO program of the EU.

The paper sets out with the role of entrepreneurial innovation as being a bridge between macro and micro perspectives and objectives reflecting the necessary interest of both sides in an effective innovation system. This discussion is followed by the key tenet of the paper in that entrepreneurial innovation should be regarded as systematically planned rather than ad hoc approach implying to integrate a range of management disciplines. Regarding management disciplines, emphasis is placed on corporate culture driven by transformational leadership as the very heart and motor of innovation management. Finally, potential external and internal barriers to innovation management are addressed with the key conceptual construct finalizing the literature review. Consecutively, the research objectives, methodology, discussion of findings, implications for practice and suggestions for further research are presented.

II. THEORY BACKGROUND

A. Innovation: Bridging Macro and Micro Perspectives

According to the European Commission (2003, in Nicholas, Ledwith and Perks, 2011), SMEs represent 99% of the total enterprises, and innovative abilities of SMEs are correlated with the recovery and the continued development of European economies.

Increasing corporate, national or regional competitiveness is regarded a key objective for economic policy (Martin, n.d.; The European Central Bank). Confirming the role of SMEs in this respect, Oke, Burke and Myers (2007, p.735) emphasize that "the governments of most developed economies see new and smaller enterprises as the well-spring of economic growth and job and wealth creation". Hence, as innovation is regarded to be a conditional factor for competitiveness (Denton, 1999), research in this field informs macro-economic strategies.

In more detail, the relationship between macro-economic aspects as, for example, needs of society and market place, technological developments, tax issues and innovation created by entrepreneurship has been established in literature (Choueke and Armstrong, 1998; Darroch and McNaughton, 2002; Shaw, O'Loughlin, and McFadzean, 2005; Wolff and Pett, 2006; Oke.et al, 2007). Relating technological developments as a cornerstone for innovation with consumer orientation, Jantunen (2005, p.338) explained that "rapid technological change and changing customers' preferences mean that the continuous introduction of product improvements and the development of new products is imperative for firms". Continuing with the micro

perspective, innovation has been linked to marketing and consumer orientation in general (Weerawardena, 2003; Drucker, 1954 in O'Dwyer et al., 2009; Neira et al., 2009), as well as to marketing behaviors of SMEs in particular (Morris and Lewis, 1995 and Sexton and Arbaugh, 1992, in: O'Dwyer et al., 2009). In the same vein, Jamrog (2006, in Fortuin and Omta, 2009, p.840) focuses on issues like "identified customer centricity, teamwork, appropriate resources, organizational communication, the ability to select the right ideas and freedom to innovate" as being crucial for companies' innovation activity.

Achieving these macro-economic and micro-economic objectives necessitates a particular mindset of entrepreneurs. According to Morris and Sexton (1996, in Chowdhury, 2007, p.240) core entrepreneurial characteristics relate to "innovativeness, calculated risk-taking and proactiveness". In addition to innovativeness, the Classical School of Entrepreneurship associates entrepreneurial characteristics with creativity and discovery (Cunningham and Lischeron in Koh, 1996). The definition of innovation of entrepreneurship by the Commission of the European Communities (2003, p. 6 in Klapper, 2004, p. 128) adds a managerial perspective: "the mindset and process to create and develop economic activity by blending risk-taking, creativity and/or innovation with sound management, within a new or an existing organization".

These characteristics crystallize the central contribution of entrepreneurs in playing a an optimizing agent exploiting market related or social imbalances and gaps and transforming them into market opportunities (O'Dwyer et al., 2009; Boyett, 1997 in Kaufmann, 2009). In this sense, entrepreneurs are innovative 'bridge builders' between macro-and micro-perspectives referring, for example, to overcoming currently existing macro problems such as public budget constraints for social purposes (Kaufmann, Mewaldt and Sanchez Bengoa, 2012), integrating economically marginalized rural areas into the global stream of business, overcoming industry segment problems in certain areas (e.g. textile, tourism, or agriculture), or providing for diversification and differentiation of products and services (Kaufmann, 2009). Beyond the aforementioned SME contribution to the economy, Henderson, (2002 in Oke, Burke and Myers 2007) confirms the SMEs' important role to connect the local community to the larger global economy.

Conclusively, knowledge on the detailed differentiated factors which foster innovation in European countries is of paramount interest for both, entrepreneurs and macro-economic decision makers alike to concertedly create an infrastructure and educational system supporting, fostering and encouraging effective entrepreneurship.

B. Innovation: Systematically Planned Based on Corporate Culture

At this stage, the important question arises of how to best generate innovation in companies as well as societies. De Jong and Den Hartog, (2007, p.41) suggest "to capitalize on their employees' ability to innovate" implying an appropriate innovation culture and programs to maximize efficiency. Central to innovation program designs is a disciplined, systematic and planned approach (Boer et al, 1990) compared to a process being perceived as natural or ad hoc (Amabile et al., 2002 in McAdam et al, 2007). Referring to Hyland and Beckett (2005), McAdam et al. (2010, p. 198-199) hold that "innovation can be treated as a process that systematically interacts with all organizational processes and product development" and

propose an innovation implementation model for SMEs. Previous research implies that a key shortcoming of entrepreneurial characteristics and skills refers to a strategy implementation gap (i.e. EU, 2005; Kaufmann, 2008; Crick, 2011). This gap could be explained in that systematic planning behavior might be inconsistent with anti-systemic features of entrepreneurs (Berglund and Johansson, 2007). Furthermore, this systematic process might be perceived as difficult and complex, due to its multidimensional character (Zhao, 2005; Neira et al., 2009) requiring to utilize and embrace the complete management discipline (Antonakis, 2006) including:

TABLE 1: Managerial Disciplines for Successful Innovation

Discipline	*Author/s*
Change management	Damanpour (1991)
Organizational learning	Wyer et al. (2000)
Action learning by SMEs	Choueke and Armstrong (1998)
Work organization systems	Weerawardena (2003)
Corporate culture (i.e. decision making patterns, teamwork, 'open culture', leadership, i.e. empowerment)	Burpitt and Bigoness (1997); Hurley and Hult (1998); Prajogo and Sohal (2003); Antonakis, (2006); Barsh et al. (2008)
Mergers & acquisition (towards synergistic combination of resources)	Christensen (2006)
Knowledge acquisition, creation and dissemination, knowledge management	Du Plessis (2007), Cohen and Levinthal (1990), Chesbrough (2003), Jantunen (2005)
Resource Management, Finance	(Freel, 2000, Vossen, 1999, and Tidd et al., in McAdam et al. (2010)
Marketing	Banterle et al. (2009)

SOURCE: developed by the researchers

Problems with complexity issues as to innovation are mentioned in a study by Deloitte Touche Tohmatsu (2003). Relating to structuring manufacturing companies for innovation in an overall supply chain context, the authors coined the phrase of 'innovation paradox" reflected by the following quote: "While manufacturers say product innovation is their top priority for driving revenue growth, it ranks last on the supply chain agenda. Time-to-market is second to last, another sign that many manufacturers' factories and logistics operations aren't prepared for a world of rapid product changes" (http://www.deloitte.com/assets/DcomShared%20Assets/Documents/SupplyChainSurvey(1).pdf).

Referring the latter study specifically to SMEs, Baard and Watts (2007) reject the view that this phenomenon is of contemporary nature only and found evidence, based on a case study of a small manufacturer, that the 'innovation paradox' did not apply to this SME.

Implying the salient importance of corporate culture for innovation success, sustained innovativeness is regarded to depend on each firm's set of dynamic capabilities, which helps it "integrate, build, and reconfigure internal and external competencies to address rapidly changing environments" (Teece et al., 1997, p. 516). In this context, Morcillo (1997) relates a culture of innovation to values and attitudes to increase the efficiency of operations even if they break the traditional or conventional routine. Especially, Corporate Culture might be

regarded as the basis for an innovation strategy which requires newly acquired or transformed capabilities implying a focus on human capital development (Branzei and Vertinsky, 2006). On the other hand, other innovation strategies, such as process, product or market development can be based on the integration of existing capabilities i.e. via research, market intelligence, assimilation or deployment (Ostgaard and Birley, 1994, Bierly and Chakrabarti, 1996, Helfat and Raubitschek, 2000, Winter and Szulanski, 2001, Zahra and George, 2002, in Branzei and Vertinsky, 2006).

Summarizing, the relationship between competitive advantage, innovation, marketing strategy, and distinctive and hard-to-imitate resources and skills is indicated by Aragón-Sánchez' and Sánchez-Marín's (2005) view. These authors regard a distinctive advantage to have any recognizable strategic value to be more and more linked to intangible assets such as innovation and technology. The composition and intensity of these assets depend on the chosen strategic positioning. To strategically best utilize innovation as an intangible asset, still existing internal and external barriers and ways to overcome them are discussed in the next paragraph.

C. Innovation Barriers and Remedies

Challenges related to innovation management are provided by a variety of internal and external factors. According to Demirbas, Hussain and Matlay (2011, p.765), "the external environment both influences and limits the innovative capacity in SMEs and disadvantages owner-managers in terms of their competitive strategy vis-à-vis larger firms". In this context, a series of external factors have been identified as limiting the SMEs's innovation capability: "government regulations or policy actions not being conducive to innovation, lack of access to funding, weak contract enforcement, or less developed local labor markets, networks and relationships or knowledge networks" (Rothwell, 1989, Lange et al., 2000, Blundel and Hingley, 2001, Keizer et al., 2002, Bougrain and Haudeville, 2002, NESTA, 2008a, b, 2009 in Hotho and Champion 2011, p. 32). Referring to an international context, Cooney and O'Connor's (1996 in Demirbas, Hussain and Matlay, 2011) as well as Keegan et al's. (1997 in Demirbas, Hussain and Matlay, 2011) work implies to conduct more country specific as well as cross-country research so as to determine which barriers are country specific and which ones are commonly identified across industrially developed or developing countries.

The European Commission puts efforts to overcome regulatory uncertainties, still stubbornly high remaining telecommunications costs, and a continuing lag behind the US in terms of venture capital. Therefore, web-based resources are provided to disseminate information to SMEs in order to enhance their competitive position and increase the level of innovativeness (Peet et al., 2002).

Relating back to the management disciplines affecting innovation as discussed in the previous paragraph, Delahaye, (2005 in Hotho and Champion, 2011) and Segarra-Blasco et al. (2008 in Demirbas, Hussain and Matlay, 2011) identified the following internal barriers: owner-manager's ability to identify, evaluate and access relevant technological information, expert skills, time, internal funds, but also knowledge systems or organizational variables including structures, cultures, norms and leadership (Tidd et al., 2001, Keizer et al., 2002, McAdam et

al., 2004, O'Regan et al., 2005, Demirbas et al, 2011 in Hotho and Champion, 2011, p.32), and finally "the absence of a formal innovation strategy and excessive administrative regulations to be the greatest barriers to innovation success" (Jamorog, 2006 in Fortuin and Omta 2009, p.840). Regarding internal barriers, Forman and Rantanen (2011) referring to Cohen and Klepper (1996a), Hannula and Rantanen (2000), Scozzi et al. (2005) and Forsman (2008), SMEs seem to lack the ability to

a. identify opportunities
b. track current market and technology trends
c. properly manage knowledge
d. assess the influence of development work on the company's business
e. develop proactive attitudes towards innovation and
f. successfully engage in networking.

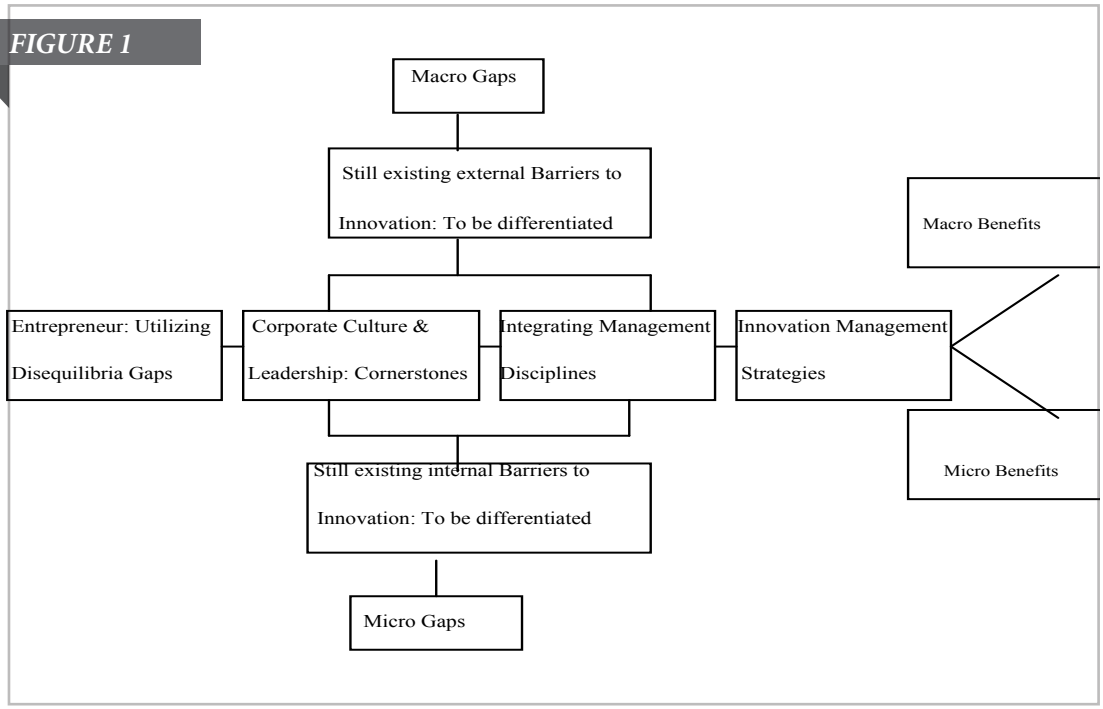
As innovations trigger fundamental organizational changes leading to the formation of new patterns of corporate and individual behavior (Morcillo, Rodriguez-Anton, Rubio, 2006), a major internal innovation hurdle is hypothesized to exist in a corporate culture which is resistant to change and adaptation. The crucial role of corporate culture in innovation driven change processes is indicated by Kotter and Hesket (1992, in Morcillo, Rodriguez-Anton, Rubio, 2006, p.350): "As a result, the destabilizing effect of innovation will always depend on the adaptive or non-adaptive nature of the cultural models applied within an organization".
Another important issue regarding innovativeness of SMEs, which embraces both external and internal perspectives, arises in the context of intellectual property protection and patents. According to Hughes and Mina (2010), occurring costs, which are higher compared to those of large firms, might prevent the use of patents in SMEs. Acknowledging progress having been made, Europe's small businesses called for a single European Community patent to be a top priority to boost innovativeness. Consequently, "the European Commission's new overview of innovation policy includes plans for a European Innovation Act" (European Union, 2011).
Summarizing, the significant investment needed to find, develop and materialize a creative idea is regarded another challenging innovation hurdle for many SMEs. Although, SMEs may have a high potential for creativity and innovativeness, they may lack the necessary finances hampering their development as discussed before. In order to address this balance, the European Commission, the European Investment Bank and the European Investment Fund have generated schemes to support innovation within SMEs. The main funding opportunities available for European SME's are (InnoSupport, 2011): • Grants • Venture capital • Banks • Stock markets • Business angels.

Taking these funding mechanisms and the generally accepted contribution of innovation to macro and micro competitiveness into account, this research intends to answer the question to what extent European SMEs are utilizing these schemes and to what extent other internal and external stumbling blocks are still existing. Furthermore, the research intends to differentiate the respective factors affecting innovation by 6 different European countries and by 'established' European settings and 'transitional' European settings.
To the knowledge of the authors, existing innovation management related studies on SMEs mainly exist for individual member states (i.e. Oke et al., 2007; Salavou and Avlonitis, 2008; Radzeviciene, 2008). Accordingly, the main aim of this study was to identify differentiated factors affecting innovation and explaining different innovation levels of European SMEs.

Reflecting the previous text, the following key research construct (Figure 1) guided the empirical research.

INNOVATION: BRIDGING MACRO- AND MICRO-PERSPECTIVES

FIGURE 1



SOURCE: author

III. RESEARCH OBJECTIVES

The research objectives of this study were to investigate still existing hurdles for innovation and the level of systematic application of different management functions relevant for innovation management in European SMEs. More specifically, the objectives of the study were to investigate if there exist cross-country differences in the levels of innovativeness of European SMEs, the extent to which companies pursue innovation as a strategic approach, the factors companies employ to encourage innovation, the factors which block innovation and the perceived level of innovation support by other institutions, agencies and companies. This information can be used as reference, as to whether factors of innovation management approaches have to be differentiated according to the different European countries.
The hypotheses for the research were:

1. There are different innovation levels of SMEs in the selected European countries.

2. European SMEs do not perceive innovation management as a systematic process.
3. There is a relationship between corporate culture and innovation management in European SMEs.
4. The factors that explain innovation hurdles have to be differentiated as to the different European countries.

A. Design and Sample

Representing an integral part of the 2 years (2008-2009) lasting MINT project (http://www.mintproject.org/), a consortium of six partners from 6 European companies was selected to investigate these research objectives. The mix of partners coming from academic and professional education institutions with partners from agencies/consultancies provided a very good basis for an action research approach.

Quantitative data were collected using a questionnaire that was specifically designed to address the research questions of the study, after in-depth examination of the literature in order to theoretically underpin the empirical stage and ensure its content validity. The questionnaire was pre-tested with 10 SMEs and an incubation center in England and Cyprus. The final version of the questionnaire was distributed to SMEs in Cyprus, England, Greece, Italy, Lithuania and Spain. Greece was divided in two parts, Athens (which is in the south part of the country, closer to the Mediterranean sea) and Thessaloniki (closer to Central Europe). The questionnaires were personally administered to the companies by the partners of the project.

The final sample included 204 questionnaires. More specifically, 30 companies were selected from Italy (14.7%), 30 from England (14.7%), 23 from Greece (Thessaloniki) (11.3%), 33 from Greece (Athens) (16.2%), 30 from Cyprus (14.7%), 30 from Lithuania (14.7%), and 28 from Spain (13.7%). The respondent in each company was either Owner, or Owner/Manager, or Senior Manager, or other manager or employee in the company.

B. Data analysis

The data were analyzed using the statistical software package SPSS. Various statistical methods were used to test the hypotheses of interest, including descriptives statistics, Chi-square (X^2) tests of independence, Analysis of Covariance (ANCOVA) and multiple regression analysis.

IV. FINDINGS OF THE STUDY

A. Respondents' profiles and company characteristics

Company profiles of the participating European SMEs in the sample were examined, in relation to the size (number of employees), type of company (public or private), location of business and type of industry. Table 1 provides profile information about the companies in the overall sample and per country separately.

TABLE 1: Information about company profiles

	Italy %	England %	Greece (Thes.) %	Greece (Ath.) %	Cyprus %	Lithuania %	Spain %	Total %
Number of employees								
Under 10								
11-49	63.3	44.8	73.9	42.4	46.7	33.3	39.3	48.3
50-250	26.7	13.8	26.1	57.6	53.3	53.3	14.3	36.0
More than 250	6.7	27.6	-	-	-	-	-	9.4
	3.3	13.8	-	-	-	-	-	6.4
Type of company								
Public	-	29.6	-	3.0	10.0	16.7	3.6	9.0
Private	100	70.4	100.0	97.0	90.0	83.3	96.4	91.0
Place of business								
a) Village (up to 2000 residents)	13.3	35.7	-	-	3.3	3.3	-	7.9
b) Town (2001-20000 residents)	30.0	42.9	4.3	-	26.7	23.3	3.6	18.8
c) Small city (20001-100000 residents)	36.7	3.6	4.3	-	43.3	70.0	14.3	25.2
d) City (more than 100000 residents)	20.0	17.9	91.3	100.0	26.7	3.3	82.1	48.0
Type of industry								
Financial								
Tourism	-	3.6	9.5	6.1	-	3.3	7.1	4.0
Retail	7.1	14.3	-	9.1	20.0	26.7	-	11.6
Engineering	3.6	7.1	9.5	-	10.0	10.0	-	5.6
Automotive	10.7	17.9	-	6.1	6.7	-	3.6	6.6
Telecom	3.6	3.6	-	-	3.3	10.0	3.6	3.5
Health	-	-	4.8	6.1	-	-	3.6	2.0
Construction	-	3.6	4.8	3.0	10.0	13.3	-	5.1
Manufacturing	-	3.6	-	3.0	6.7	3.3	-	2.5
Research	25.0	3.6	-	-	-	3.3	14.3	6.6
Consulting	17.9	-	9.5	3.0	-	-	3.6	4.5
Services general	-	3.6	19.0	3.0	-	3.3	35.7	8.6
Other	10.7	10.7	9.5	9.1	30.0	10.0	3.6	12.1
	21.4	28.6	33.3	51.5	13.3	16.7	25.0	27.3

SOURCE: Author

B. Cross-country differences in innovation levels

An index of innovation was created, using items 7 (New products/services in last 2 years), 8 (Social innovations in last 2 years), 9 (Process innovations in last 2 years), 14 (Number of patents registered in last 2 years). These items were originally rated on a 4-point scale (none, 1, 2-4, 5-10 and more than 10). The questions were recoded accordingly, so that low values showed a low degree of innovation and high values of the index showed that the company has a high level of innovation. The respondents' answers were averaged so that the index ranged continuously from 0 to 4, where zero shows no innovation.

Before examining cross-country differences in innovation levels, the respondents' profiles in the sample were examined, in order to see if any adjustments were necessary. Chi-square tests showed that indeed the respondents had significant cross-country differences in terms of their position in the company ($p<0.001$), gender ($p<0.001$), age ($p=0.04$), level of education ($p<0.001$) and familiarity with innovation processes ($p=0.004$). In addition, a Chi-square (X^2) test showed that cross-country differences existed in relation to the size of the SMEs (p-value<0.001). Therefore, the innovation index means were adjusted so that the respondents' profiles and the size of the SMEs in each country would not affect the results, and that samples were made comparable. Marginal means were estimated for each country, along with 95% confidence intervals. An Analysis of Covariance (ANCOVA) F-test for cross-country comparisons of the innovation level was performed, where the covariates were the aforementioned demographic characteristics of respondents and the size of the companies. Confirming hypothesis 1, the results showed significant country differences in terms of innovation ($F=3.881$, $p=0.001$), where Cyprus had the highest level of innovation and Spain had the lowest. All the results regarding cross-country differences in innovation levels appear in Table 2.

TABLE 2**:** Estimated marginal means, confidence intervals, ANCOVA results (F-Statistic, degrees of freedom, p-value), for cross-country comparisons for innovation- adjusted for respondents' profile and size of SME.

Country	n	Mean	Lower Bound of 95% CI	Upper Bound of 95% CI	F (df)	p-value
Italy	30	1.358	1.097	1.618		
England	30	1.265	1.023	1.507		
Greece (Thessaloniki)	23	1.466	1.174	1.757		
Greece (Athens)	33	1.135	.917	1.354	3.881 (6)	0.001
Cyprus	30	1.561	1.330	1.793		
Lithuania	30	1.444	1.209	1.680		
Spain	28	0.801	.529	1.073		
Total	204	1.290	1.204	1.377		

SOURCE: Author

Examination of the individual items that constitute the innovation index provided additional intuition to the results. More specifically, the results showed that the highest level of product/service innovations were achieved in Cyprus, Greece (Thessaloniki) and Lithuania. However, a relatively high percentage (around 30%) of SMEs in Cyprus, Italy and Spain did not generate

any product/service innovation in the last two years. Similar or higher percentages of no social and process innovations were also observed in these countries.
The highest level of patent registrations was observed in Cyprus, followed by Spain and Italy. However, the vast majority of 91.7% did not register a patent in the last 2 years, with Lithuania not achieving a single patent registration. Whereas England confirms the general trend of this deplorable state of patent registrations, a small number of companies (3.3%) achieved more than 10 registrations in the last two years. Chi-square tests revealed that significant cross-country differences existed regarding how long it takes for the introduction of new products to the market, where the quickest 'introducers' are Cyprus, England and Italy with Spain, Lithuania and Greece being the slowest ones ($p<0.001$). Whereas 77.3% of the respondents need only up to one year for product/service introduction, 22.8% need 2 or more years. A lack of strategic approach as to innovations is reflected in that almost 34% of the companies do not state innovation in its corporate strategy with Cyprus negatively heading the list (70%) ($p<0.001$).

Moreover, 50.5% of all companies introduce the products quicker than the competitors (first to market strategy). Significant cross-country differences existed ($p=0.003$), where especially Cyprus (30%) followed by Lithuania (27.6%) lag behind competitors in terms of speed of product introduction. Around 29% of all companies do not quickly integrate social changes or tendencies. Significant cross-country differences exist, with Spanish SMEs being the least open (66.7%) to this very important factor of the external business environment ($p=0.002$). Confirming hypothesis 2, the lack of strategic approaches as to innovation is highlighted by a lack of innovation department or formal innovation processes stated by 73.6% of all companies, with no significant cross-country differences ($p=0.621$). 64.7% of all companies are innovating organically. Cross-country differences exist ($p<0.001$), with England having the highest percentage of organically innovating companies (86.2%), and Lithuania the lowest (23.3%).

Better technology, new market opportunities and customers' requirements are perceived by all companies as reasons for improvements. Minimizing waste, cost reduction and, especially, suppliers' suggestions are less considered reasons for improvements. Taking the generally accepted importance of customer orientation into account, it is astonishing that customer requirements are only considered to a very low extent as reasons for improvements in Italy, Greece (Athens) and Spain. 83.6% of all SMEs perceived the improvements as having been successful measured by financial gains (43.5%) and increased market position (40.1%).

C. Cross-country differences in Corporate Culture

An index of corporate culture was created based on questions 20 (Your company empowers employees to actively contribute to innovation), 21 (if managers/senior employees/employees participate in new ideas), 23 (if you are not the owner do you feel you have influence on new product or service development), 25 (is the corporate culture supportive of innovation) and 28 (Do you perceive resistance to change?). The questions were recoded accordingly, so that low values showed a low degree of corporate culture and high values of the index showed that the company has a high level of corporate culture. The respondents' answers were averaged so

that the index ranged continuously from 0 to1, where zero shows no corporate culture at all. Descriptive statistics for the corporate culture index appear in Table 3.

TABLE 3: Descriptive statistics for corporate culture index

Country	Mean	Std. Deviation	Minimum	Maximum
Italy	.6458	.16517	.33	.83
England	.7685	.20721	.33	1.00
Greece/Thessaloniki	.5833	.23570	.17	.83
Greece/Athens	.6667	.34960	.17	1.00
Cyprus	.5370	.41443	.00	1.00
Lithuania	.7308	.24073	.17	1.00
Spain	.6250	.28549	.00	1.00
Total	.6619	.28770	.00	1.00

SOURCE: Author

Cross-country statistical comparisons were performed on corporate culture index, using ANCOVA to adjust for the respondents' profiles and companies' size, in order to have comparable samples. Results showed that no significant differences in corporate culture existed between the countries (F=1.507, p-value= 0.185). Results on the total sample showed that around 25% of SMEs do not empower employees to actively contribute to innovation. Also, around 27.3% of all respondents, of those who are not the owner, do not perceive an influence on new product and service development. In the majority of cases, new product ideas come from owners, especially in Cyprus, Italy and Greece (Thessaloniki). The paramount role of the customer as well as the supplier for product idea provision is mostly acknowledged only by Cyprus and England. Interestingly and encouragingly, in most of the cases across all countries 'any employee' is integrated in product/service idea selection and screening, especially in Greece (Thessaloniki), Lithuania and England. Again, customers and suppliers are less considered in this respect.

Most companies (77.1%) regard their employees as skilled in product/service development or creativity, and no cross-country differences existed (p-value=0.613). Also, corporate culture is regarded by the vast majority of respondents (82.6%) as supportive for innovation, and no cross-country differences existed (p-value=0.330). In those cases, where corporate culture was not regarded as conducive to innovation, the main reasons for that were lack of necessary resources (49%), lack of preparedness to take risks (42.9%) and lack of innovation training for employees (28.6%).

D. The relationship between Corporate Culture and Innovation

Correlation analysis was performed, in order to examine the relation between corporate culture innovation and innovation level (hypothesis 3). The Pearson correlation coefficient was calculated between the two indices, both, for the total sample and for each country separately. Results showed that a positive relationship existed between the two indices for the total sample ($r=0.494$, $p<0.001$), indicating that the higher the corporate culture level, the higher

the innovation level. When examining the relation for each country separately, the relation between corporate culture and innovation was significant for Cyprus (r=0.885, p<0.001) and Lithuania (r=0.490, p=0.011). There was no relation between the two indices for Italy (r=0.354, p=0.437), England (r=0.217, p=0.403), Greece (r=0.431, p=0.334 for Thessaloniki and r=0.531, p=0.278 for Athens) and Spain (r=0.089, p=0.710).

E. Factors that significantly affect innovation

In an attempt to identify which factors significantly lead to successful/unsuccessful innovation, a stepwise multiple regression analysis was performed, with dependent variable the innovation index and independent variables the key items of the questionnaire. The results regarding the total sample appear in Table 4.

TABLE 4**:** Stepwise Multiple Regression for innovation: all countries together

	B	Stand. Coef-ficient	T	p-value	R Square	Adj. R Square	R Square Change
(Constant)	1.603		3.429	.001			
Culture index	1.028	.349	4.299	<.001	.368	.359	.368
Department or formal process	-.525	-.263	-3.144	.002	.521	.508	.153
Company Size	.311	.291	3.692	<.001	.594	.576	.072
Review of existing products	-.443	-.238	-2.981	.004	.639	.619	.046

SOURCE: Author

The results showed that the factors that significantly lead to successful innovation, in order of importance (as indicated by Rsquare change), are: 1) Corporate culture (b=1.028, p=0.001), where the positive coefficient shows that when corporate culture index increases by 1 unit, then innovation index increases by 1.028 units. 2) If the company has a department of innovation or a formal process for innovation (b=-0.525, p<0.001). The negative coefficient shows that if the company does not have a department or a formal process for innovation then the innovation index decreases (the variable was coded as 1=yes, 2=no). 3) The number of employees, i.e. the size of the company (b=0.311, p<0.001). The positive coefficient shows that the more employees the higher the level of innovation, or, on average, when moving from one company size category to the next the innovation index increases by 0.311 units, and 4) whether existing products, even successful ones, get reviewed from time to time (b=-0.443, p=0.004). The negative coefficient shows that if a company reviews existing products then the innovation index increases. The final Rsquare of the model is 63.9%. The most important variable is "culture index" (it explains 36.8% of the variation).

In order to see if differences exist in which factors significantly affect innovation in each country, Table 5 summarizes the results in a comparative way.

TABLE 5: Stepwise Multiple Regression for innovation: cross-country comparison

Factor	Italy	England	Greece (Thes.)	Greece (Athens)	Cyprus	Lithuania	Spain
Company Size	b=1.883 p=.049 R^2ch.=.367	b=.664 p=.009 R^2ch.=.552		b=.444 p=.006 R^2ch.=.174			b=.659 p<0.001 R^2ch.=.591
Department or Formal process	b=-1.015 p=.026 R^2ch.=.164					b=-.670 p=.005 R^2ch.=.410	
Innovation part of Strategy				b=-.928 p=.001 R^2ch.=.234		b=-.653 p=.005 R^2ch.=.205	
Culture index					b=1.768 p=.002 R^2ch.= .766		
Review of existing products					b=-.826 p=.002 R^2ch.=0.064		
Integration of social trends						b=-.444 p=.019 R^2ch.=.124	b=-.836 p=.005 R^2ch.=.204
Applied for public funds						b=-.412 p=.043 R^2ch.=.052	
Rsquare	0.531	0.552	N/A	0.408	0.830	0.791	0.795

SOURCE: Author

Overall, the results showed that different factors lead to successful/unsuccessful innovation in the various European countries confirming hypothesis 4. No significant factors were found for Greek SMEs in Thessaloniki. The size of the company is a significant factor for innovation in most of the countries. In general, the model Rsquare was satisfactory for all countries, but the best model was for Cyprus, with the corporate culture index and review of existing products explaining 83% of the variation in the innovation index. The largest number of significant factors was found for Lithuanian SMEs, namely 1) If the company has a department of innovation or a formal process for innovation, 2) If innovation is part of the strategy, 3) If the company quickly integrates social trends and 4) If the company has applied in the past for public funds.

F. Current stumbling blocks of innovation

The two major reasons blocking innovation are seen to be lack of money (42.2%) and lack of time (40.6%). The lack of money is strongest perceived in Italy, Greece (Thessaloniki) and Lithuania. A perception of a lack of time (most prevalent in Greece –Thessaloniki- and England) points to an underestimation of the strategic importance of innovation and creativity and confirms the existing lack of an innovation department or formal processes as to innovation. It catches the idea that 50% of Cyprus SMEs seem to lack creative ideas and that the company's risk adverse culture is seen as the major stumbling block for innovation in Greece (Athens) and Cyprus. The reasons for previous innovation problems are quite equally scattered with high

production costs (31.2%) being regarded as the major problem in retrospect. The measurements for innovation success are quite equally evaluated being 'financial growth', followed by 'better market position' and 'business growth'. The relevance of resistance to change was confirmed by 36.5% of all respondents. Chi-square tests have shown significant cross-country differences in perceived resistance to change (X^2=25.5, p<0.001), where it is most prevalent in Cyprus (70%) and Greece (Thessaloniki) (54.5%).

Since lack of money has been shown to be an obstacle in innovation, it is very important to observe funding options for European SMEs. Results have shown that only 40% of employees state that government institutions in their countries support innovation in SMEs. Significant cross-country differences (X^2=25.2, p<0.001) show that the highest level of government support is perceived in England (62.5% of respondents claimed so) and Spain (56%), and the lowest is in Cyprus (only 6.9% responded affirmatively). Among all SMEs the most known funding organizations are the European Union (EU) (52.7%) and the Regional Development Agencies (41.9%) with the knowledge level of other important fund providers being below 10% respectively. Taking the aforementioned role of capital with regard to stumbling blocks for innovation and corporate culture into account, it is most alarming that 64.3% of all employees never applied for public funds. Significant cross-country differences existed (X^2=29.6, p<0.001), with Cyprus (96.7%) and England (77.8%) being the leaders of never having applied for public funds. Higher levels of fund applications exist, according to this study, in Greece (Athens) (60.6%) and Spain (48.1%). However, 61.9% of all SMEs intend to apply in the future for funding but still a relatively high number of 38.1% do not intend to apply for funds in the future. Again, cross-country differences existed (X^2=27.8, p<0.001), where the highest percentage of SMEs that do not intent to apply for funds is in Cyprus (60%) and Italy (59.8%). On the contrary, the highest number of funding proposals can be expected to come in the future from Greece (Thessaloniki) (90.5%) and Lithuania (86.2%). As very disappointing and detrimental for innovation development can be regarded the very low level of SME co-operation with universities in the six countries under examination, where 62.2% of all companies do not co-operate with universities in terms of innovation.

V. DISCUSSION

This study has investigated Innovation Management of SMEs in six European countries, namely the United Kingdom, Cyprus, Spain, Italy, Greece and Lithuania. The six countries under examination have different characteristics and represent both established and transitional or emerging settings.

A. Contribution of the current study

The methodology used has provided the advantage of differentiating the respective SME perceptions, key factors and levels of innovation management. This is a contribution to the field and gives new insight into the discussion regarding the catalytic role of SMEs in generating innovation as a basis for a competitive economy. More specifically, the current study conceptualized and measured two important concepts, innovation and corporate culture, thus providing a numerical framework for their examination. These new indices were the innovation index and the corporate culture index, which were hereby created specifically

for the context of this study. Moreover, the use of the statistical method of ANCOVA made the samples from the six European countries comparable, by adjusting for the respondents' profiles and the size of the SMEs in each country, and ensuring that these individual characteristics would not affect the results. The results of the study can be considered in two levels, both an integrated European level as well as an individual country level. This is because, on one hand, the results have shown that there are no significant cross-country differences in some of the issues investigated, but on the other hand, significant country differences in terms of innovation were found.

B. Main results

Regarding the integrated level, some general conclusions can be drawn regarding innovation management of European SMEs. For example, there appears to exist a general lack of strategic approaches as to innovation, without significant cross-country differences, since there is a general lack of innovation department or formal innovation processes in the European SMEs. Moreover, results showed that no significant differences in corporate culture existed between the countries, which implies that, on average, the means of empowerment, infrastructure, incentives, training and teamwork are used to almost the same extent across all countries. No cross-country differences existed also in terms of whether companies regarded their employees as skilled in product/service development or creativity, where most companies agreed on this. The findings showed that corporate culture is regarded by the vast majority of respondents as supportive for innovation similarly in all European countries under examination. Finally, the study has shown that the two major reasons blocking innovation are seen to be lack of money and lack of time. The measurements for innovation success are quite equally evaluated being financial growth, followed by better market position and business growth. Results have shown that government institutions do not generally support innovation in SMEs. As very disappointing and detrimental for innovation development can be regarded the very low level of SME co-operation with universities in the six countries under examination.

On the other hand, our results have indicated that different strategies need to be used in each country under examination, because the levels of innovation management differ between the European countries, as well as the individual factors that affect innovation. All cross-country differences could be due to cultural or identity variations supported by Sommer et al (2009) and Rujirawanich et al (2011) as well as differences in the quality of life and overall stability and prosperity of the economy. Interestingly enough, in Greece, which was divided into two parts, many differences exist between the northern part (Thessaloniki) and the southern part (Athens). When considering the innovation index, created in this study, Cyprus has been shown to have the highest general level of innovation. In addition, considering individual components of the index, the results showed that the highest level of product/service innovations were achieved, apart from Cyprus, also in Greece (Thessaloniki) and Lithuania. However, a relatively high percentage of SMEs in Cyprus, Italy and Spain did not generate any product/service innovation nor had any social or process innovations in the last two years. Hence, in Cyprus, although on average the innovation level is high, there seems to be a gap between very innovative and less innovative companies. In total, the companies prefer more incremental rather than radical product changes. Only in Cyprus and Greece (Thessaloniki) higher levels of radical changes are apparent. In relation to companies innovating organically,

cross-country differences existed, with England having the highest percentage of organically innovating companies and Lithuania the lowest.
Better technology, new market opportunities and customers' requirements are perceived by all companies as reasons for improvements. Minimizing waste, cost reduction and, especially, suppliers' suggestions are less considered reasons for improvements. Taking the generally accepted importance of customer orientation into account, it is astonishing that customer requirements are only considered to a very low extent as reasons for improvements in Italy, Greece (Athens) and Spain.

A very important finding of the study is that in the majority of cases, new product ideas come from owners, especially in Cyprus, Italy and Greece (Thessaloniki). There seems to be a contradiction between the awareness of the importance of customer requirements and the actual involvement of customers in the innovation and creativity process. The paramount role of the customer as well as the supplier for product idea provision is mostly acknowledged by Cyprus and England. These findings on the necessity to enhance customer and supply chain involvement in innovation is confirmed by Laforet's (2011) findings. Interestingly and encouragingly, in most of the cases across all countries 'any employee' is integrated in product/service idea selection and screening, especially in Greece (Thessaloniki), Lithuania and England. Again, customers and suppliers are less considered in this respect.

When all European countries were considered together, the results showed that the factors that significantly lead to successful innovation, in order of importance were found to be corporate culture, having a department of innovation or a formal process for innovation, the size of the company (the more employees the higher the level of innovation) and reviewing existing products from time to time, even successful ones. However, it is very important that the current study has shown that different factors lead to successful/unsuccessful innovation in the various European countries. These factors included some or even none of the above four factors, as well as additional factors, such as if innovation is part of the strategy, if the company quickly integrates social trends and if the company has applied in the past for public funds (e.g. Lithuania).

C. Implications for practice and suggestions for future research

The findings indicate that higher levels of product/service introductions should be pursued in Italy, Spain and Cyprus and that, in addition to product/service and incremental innovation, a stronger emphasis should be placed on social-, process- and radical innovation. Customer requirements, supplier suggestions, minimizing waste and cost reduction should be taken more intensively into account as reasons for product/service improvements. Referring to all SMEs higher levels of patent registrations are strongly suggested. The awareness of the importance of continuously tracking and integrating social trends as a major source for innovation has to be increased. Innovation should be perceived by the SMEs as a systematic and formal process with paramount strategic implications (i.e. creating innovation departments). The leadership function of empowering employees should be significantly improved by even stronger involving them in innovation development, knowledge management systems, training or teamwork. The importance of employees being skilled and trained in creativity and innovation techniques is

confirmed by this research albeit with differentiated levels in the respective countries. Due to the strategic importance of innovation appropriate resources in terms of capital and time have to be allocated to innovation. Resistance to change is an existing phenomenon and has to be expected and planned for when intending to improve the level of innovation. Most concerning, SMEs do not feel to be supported by governments as to innovation activities. The reasons for this perception are suggested to be subject for further research. Research questions could include if this negative perception is due to lack of communication with the government, governmental and EU agencies (i.e. EU Info Centers) or if a real actual lack of support exists. SMEs should be supported for when applying for public funding and should, also, collaborate with Universities/Colleges in order to engage in concerted actions to facilitate innovation for the benefit of the companies as well the regional/national economies. SMEs might better utilize research resources of universities to mitigate the capital gap and universities might take a more prominent role in supporting SMEs as to funding information and actual procedures. Moreover, the findings imply that government development and innovation strategies should be developed in close co-operation and intensified communication with SME representatives. The findings of the study enable educators, trainers, consultants, and industrial associations to focus on SME specific factors of Innovation Management and to differentiate as to the six European countries. The existence of cross-country differences in innovation constitutes by itself an area for further research. Further research is especially suggested to take place in Central and Eastern European countries to enable a better comparison between established and transitional economic settings in Eastern Europe. The limitation of the research refers mainly to the relatively small samples per country.

CONCLUSIONS

Innovatively, the study revealed that significant differences as to innovation levels between the SMEs in the six EU countries as well as different explanatory variables for the respective level exist. The analysis has been performed both on an integrated as well as on an individual country basis and has shown that different approaches should be taken for each country. Regarding the major hurdles for higher innovation levels, most concerning are the findings that SMEs do not perceive to be sufficiently enough supported by their governments, and that a strong hesitation to apply for public funding could be observed on behalf of the SMEs. The results of the current study have shown a positive relation between innovation and corporate culture overall in the European SMEs under examination. Multiple Regression analysis led to four independent variables explaining innovation management when considering all countries together. These are, in descending order of degree of explanation, corporate culture, formal processes/innovation department, size of company and review of products. Differences in the factors that significantly affect innovation exist between the various countries, but the size of the company appears to be generally a very important factor, with a large number of employees being associated with higher levels of innovation. Apart from the four aforementioned variables that have been found significant, other variables such as whether innovation is part of the strategy, whether the company quickly integrates social trends and whether the company has applied in the past for public funds have been shown to be important for successful innovation. Relating back to the discussion in literature, the findings suggest to further test the hypothesis that the 'innovation paradox' which according to the Deloitte Touche Tohmatsu study relates to manufacturers might similarly apply for SMEs as well. Future studies might also validate a

'customer collaboration paradox' (as mentioned by Deloitte Touche Tohmatsu) as the current study strongly points to it. Generally, Jamorog's finding is confirmed albeit the absence of a formal innovation strategy is superseded by corporate culture as the most influential explanatory factor of innovation management. In general, this study has provided new and useful information both on innovation management at a general European level and for the individual countries under examination.

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HANS RUEDIGER KAUFMANN, HARITINI TSANGAR, DEMETRIS VRONTIS

INOVATIVNOST EUROPSKIH MALIH I SREDNJIH PODUZEĆA: MISIJA JOŠ NIJE ZAVRŠENA

Sažetak

Cilj rada je doprinos raspravi o katalitičkoj ulozi malih i srednjih poduzeća u stvaranju inovacija kao osnove za konkurentnu ekonomiju. Rad je usredotočen na šest europskih zemalja, kako razvijenih tako i onih u tranziciji (Ujedinjeno Kraljevstvo, Cipar, Španjolska, Italija, Grčka i Litva). Korištene statističke metode uključuju ANCOVA, višestruku regresijsku analizu i hi-kvadrat testove. Dani su čimbenici koji objašnjavaju stupnjeve inovacije. Stvoreni su indeksi inovacija i korporativne kulture za koje se ispostavilo da su korelirani. Prikazane su četiri varijable kako bi se objasnilo upravljanje inovacijama u šest zemalja: korporativna kultura, odjel formalnih procesa/inovacija, veličina poduzeća i pregled proizvoda. Na taj su način za tih šest zemalja diferencirane percepcija malih i srednjih poduzeća, ključni čimbenici i razine upravljanja inovacijama. Takav je sveobuhvatni diferencirani pristup inovativan doprinos ovom području.

Ključne riječi: *Europska mala i srednja poduzeća, upravljanje inovacijama, korporativna kultura, indeks inovacije, ANCOVA, višestruka regresija.*

LONG MEMORY IN EASTERN EUROPEAN FINANCIAL MARKETS RETURNS

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ABSTRACT

The paper examines the long memory property of stock returns and its implications using daily index returns for eight CEE emerging markets: Romania, Hungary, Czech Republic, Poland, Slovenia, Bulgaria, Slovakia, and Croatia. Several nonparametric methods for testing for long memory are employed, as well as parametric long memory models. The ARFIMA-FIGARCH model seems the most appropriate specification since the nonlinearity tests can not reject the null of independent and identically distributed residuals, implying that this specification accounts for the nonlinearity in the data. The estimated fractional differencing parameter is statistically significant in seven of the eight emerging economies employed in the study, suggesting the presence of long memory in the returns in these financial markets.

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I. INTRODUCTION

The existence of long memory in financial asset returns has been an important subject of both theoretical and empirical research. If asset returns display long memory, the series realizations are not independent over time, and values from the remote past can help forecast future returns. According to Fama (1970), under the 'efficient market hypothesis' (EMH), stock market prices must always show a full reflection of all available and relevant information and should follow a random walk process. Market efficiency implies the absence of pure arbitrage opportunities and denies the profitability by the use of historical data. Successive returns should therefore be independently and identically distributed (*iid*). An efficient financial market can be described as one for which no deterministic pattern can be detected. Efficiency validation is sometimes reduced to test whether the returns data generating process of is deterministic or stochastic. Therefore, the presence of long memory in asset returns contradicts the weak form of the market efficiency hypothesis, which states that, conditioned on historical returns, future asset returns are unpredictable. Mandelbrot (1971) suggests that in the presence of long memory, pricing derivative securities with martingale methods may not be appropriate.

Based on the information set, there are three types of efficient markets: weak-form, semi-strong-form, and strong-form efficient if the set of information includes past prices and returns only, all public information, and any information public as well as private, respectively. A large body of literature accumulated over the past three decades has focused on the validity of the weak-form efficient market hypothesis (EMH) with respect to stock markets. Worthington and Higgs (2006) have studied the weak-form market efficiency of twenty-seven emerging markets in different regions concluding that most of them are weak-form inefficient. Kvedaras and Basdevant (2002) have tested the efficiency of financial markets in the Baltic States concluding that they are approaching the weak form of efficiency. Harrison and Paton (2004) examined the evolution of stock market efficiency in the Bucharest Stock Exchange using a GARCH model. They found strong evidence of inefficiency in the Bucharest Stock Exchange. Work on testing the weak form of market efficiency where nonlinearities are taken into account is limited and international evidence includes Brooks (2007), Lim et al. (2008), Panagiotidis (2005), and Alagidede and Panagiotidis (2009). Alagidede and Panagiotidis (2009) examines the efficiency of seven emerging African markets finding no evidence to reject weak form efficiency for these markets.

A number of studies have tested the long memory hypothesis for stock returns and the evidence is mixed. Using the classical rescaled-range method, Greene and Fielitz (1977) report evidence of persistence in daily U.S. stock returns. Lo and MacKinley (1988) and Poterba and Summers (1988) concluded that stock returns exhibit mean reversion. Fama and French (1988), who examined the autocorrelations of one-period returns, also found mean reversion. Lo (1991), using modified rescaled range statistic finds no evidence of long memory in a sample of U.S. stock returns. Mills (1993), using the modified statistic and the semi-parametric approach of Geweke and Porter-Hudak (1983) finds evidence of long memory in monthly U.K. stock returns. Cheung and Lai (1995), using the same methods, find no evidence of persistence in several international stock returns series. On the other hand, Henry (2002) finds long memory in the German, Japanese and Taiwanese markets. Lobato and Savin (1997) and Caporale and Gil-Alana (2001) find no evidence of long memory in daily Standard and Poor 500 returns. The vast majority of studies focused on developed financial markets, with

less attention to emerging countries. CEE emerging markets are characterized by a lower liquidity and a higher volatility than developed financial markets. These features may induce different dynamics of the financial returns in these markets. Kasman et al. (2008) investigate the presence of long memory in eight CEE emerging stock markets and find strong evidence of long memory in both conditional mean and variance and that the ARFIMA-FIGARCH model outperforms ARFIMA-GARCH and ARFIMA-HYGARCH models in terms of out-of-sample forecast.

This paper examines the long memory property of stock returns and its implications using daily index returns for several CEE emerging markets: Romania, Hungary, Czech Republic, Poland, Slovenia, Bulgaria, Slovakia, and Croatia. In this study, we use the basic Random Walk (RW) model, several nonparametric methods for testing for long memory, as well as parametric long memory models. The basic RW model is used directly to test for the random walk hypothesis (RWH). GARCH models are also employed to capture the main characteristics of financial time series such as fat tails, volatility clustering, and persistence in volatility. GARCH type models are a convenient modality to capture the stylized facts of financial returns. For example, the two-dimensional Copula-GARCH model developed in Necula (2010) can be employed to analyze the dependency structure between financial returns.

Our paper differs from similar studies in that the focus is on CEE emerging markets and in that the methodology permits a thorough investigation of the dynamics of financial returns. More specifically, we use nonlinear serial independence tests to confirm the adequacy of these models by employing a battery of tests used by Patterson and Ashley (2000). Patterson and Ashley (2000) point out that a standalone statistical test for nonlinearity can only detect (or fail to detect) nonlinearity. Therefore, the application of a battery of nonlinearity tests can provide valuable information about any nonlinear structure in the data generating process on a given time series. The five tests include the McLeod and Li (1983) for ARCH effects; the Engle (1982) LM test for GARCH effects; the BDS test proposed by Brock et al. (1996); the Tsay (1986) test for quadratic serial dependence; and the Hinich (1996) bicovariance test for third order serial dependence. All the tests are based on the same hypothesis that once any linear serial dependence is removed from the data, the remaining serial dependence must be due to a nonlinear data generating process.

The rest of the paper is structured in three sections. The second section presents the data and the econometric methodology, the third section points out the main finding of the study and the final section concludes.

II. DATA AND METHODOLOGY

The data consists of daily returns of BET (Romania), BUX (Hungary), PX50 (Czech Republic), WIG20 (Poland), SVSM (Slovenia), SOFIX (Bulgaria), SAX (Slovakia), and CROBEX (Croatia) for a period up to December 2010. Table 1 reports the summary statistics of the daily return series together with the sample period. These include the mean, the standard deviation (highest in Poland, lowest in Slovenia), skewness (negative for almost all countries) and kurtosis (highest in Bulgaria, lowest in Poland).

The Jarque–Bera statistic rejects normality, evidence similar to the findings in Necula (2009) that look at the distribution of emerging markets index returns and concludes that the Generalized Hyperbolic Distribution is more appropriate than the Gaussian distribution to model stock index returns. Non-normality could be induced in part by temporal dependencies in returns, especially second moment temporal dependence. The presence of such dependence is tested by the Ljung–Box statistic calculated for ten lags. The hypothesis that all autocorrelations up to the 10th lag are jointly zero is rejected for all the eight countries. It is well documented that infrequent non-synchronous trading generates spurious autocorrelation in index returns (Scholes and Williams, 1977; Muthuswamy, 1990). A number of studies have suggested ways to correct for infrequent trading. Miller et al. (1994) proposed to remove the effects of thin trading by using moving averages, which reflects the number of non-trading days, and then adjusting returns accordingly. However, after applying Miller procedure the autocorrelations were still present in the data entailing the usage of a long memory model.

The econometric methodology employed consists of the following steps:

1. the random walk model (RW) is estimated for the returns of each of the eight indexes and the residuals are tested for *iid* through a battery of five nonlinearity tests as described in Patterson and Ashley (2000): McLeod and Li (1983) for ARCH effects; the Engle (1982) LM test for GARCH effects; the BDS test proposed by Brock et al. (1996); the Tsay (1986) test for quadratic serial dependence; and the Hinich (1996) bicovariance test for third order serial dependence; see Patterson and Ashley (2000) for more details about each test;

TABLE 1. Descriptive statistics of the daily returns

	Romania	Hungary	Czech Republic	Poland	Slovenia	Bulgaria	Slovakia	Croatia
period	1997 - 2010	1991 - 2010	1994 - 2010	1991 - 2010	1994 - 2010	2000 - 2010	1993 - 2010	2002 - 2010
no. obs.	3249	4997	4104	4464	4128	2523	4152	2074
mean	0.000514	0.000612	0.000049	0.000865	0.000284	0.000496	0.000201	0.000275
std. dev.	0.020287	0.017308	0.014622	0.020864	0.011998	0.018584	0.015846	0.015141
skewness	-0.203059	-0.553215	-0.422449	-0.004647	-0.389906	-0.461261	0.360834	0.30793
kurtosis	13.51945	14.04536	14.31309	9.390193	12.97703	27.96914	22.47978	18.45869
JB	15002.76***	25656.31***	22007.66***	7595.246***	17225.68***	65630.5***	255461.8***	20683.87***
LB	44.141***	88.684***	66.431***	274.01***	323.41***	62.622***	181.91***	63.290***

Source: authors calculations

*Notes: *** deotes statistical significance at 1% level; JB is the Jarque-Bera test statistic for normality; LB is the Ljung-Box statistic for autocorrelation up to 10 lags*

2. several non-parametric or semi-parametric methods are employed for testing for long memory: the generalized R/S statistic (Lo, 1991; Cavaliere, 2001) and the GPH method (Geweke and Porter-Hudak, 1983); R/S tests seem to be unaffected by the so-called 'converse Perron effect' that consists in rejection of the unit root hypothesis (in favor of trend-stationarity) when the true generating process is I(1) with a broken trend;
3. if the residuals of the RW model are not *iid* or the nonparametric tests detect long memory in the returns, an $ARFIMA(0,d,0)$ long memory (LM) model is estimated to account for autocorrelations in returns and the residuals are tested for *iid*;
4. if the residuals of the LM model are not *iid,* GARCH effects are taken into account and an $ARFIMA(0,d_1,0)-FIGARCH(0,d_2,0)$ model is estimated to account for volatility clustering and persistency in volatility.

To test the assumptions implied by the random walk model, the following equation is estimated by OLS:

$$r_t = \mu + \varepsilon_t \qquad (1)$$

where r_t is the return in day t.

Under the RW model the estimate of the constant μ should be insignificantly different from zero and the residuals should be *iid*. If the null of *iid* cannot be accepted, the implication is that the residuals contain some hidden, possibly non-linear structure. The estimation procedure and the five nonlinearity tests have been implemented using Ox object-oriented matrix programming language (Doornik, 2007).

A popular parametric method of capturing long memory is the fractionally differenced time series model of Granger (1980), Granger & Joyeaux (1981), and Hosking (1981). To test for long memory an *ARFIMA(0,d,0)* is estimated using the arfima package in Ox (Doornik & Ooms, 2003):

$$(1-L)^d r_t = \varepsilon_t \qquad (2)$$

where L is the lag operator, $(1-L)^d = \sum_{k=0}^{\infty} \frac{\Gamma(k-d)}{\Gamma(-d)\Gamma(k+1)} L^k$, and $\Gamma(\cdot)$ is the Gamma function. The mean parameter, μ, is omitted since the theory suggests that it should be statistically insignificant.

Three different types of specifications for the variance equation are estimated in this study using the G@RCH Ox package (Laurent and Peters, 2006). The first is the plain GARCH(1,1) model. The lag order (1,1) seems to be sufficient to capture all of the volatility clustering that is present in financial returns data (Brooks and Burke, 2003). The second specification accounts for the leverage effect. The notion of asymmetry has its origins in the work of Black (1976). A model that captures asymmetry is the EGARCH model of Nelson (1991). Numerous studies (Ding et al., 1993; Briedt et al., 1998) conclude that the volatility of financial assets is persistent. To account for this persistence the *FIGARCH(0,d,0)* model of Baillie et al. (1996) is employed

in this study. The most sophisticated specification, consisting of long memory in the mean equation (d_1), of long memory in the volatility (d_2), and leptokurtic distribution (*t*-Student) is given by:

$$\begin{aligned} \left(1-L\right)^{d_1} r_t &= \varepsilon_t \\ \varepsilon_t &= z_t \sigma_t \\ \left(1-L\right)^{d_2} \varepsilon_t^2 &= \omega + \left(\varepsilon_t^2 - \sigma_t^2\right) \\ z_t &\sim t(\nu) \end{aligned} \qquad (3)$$

where ν is the degree of freedom of the t -Student distribution.

III. RESULTS

A. The Random Walk Model

The Random Walk Model estimates (1) are presented in Table 2. The t-statistic of the estimated constant indicates that the expected daily return is not significantly different from zero. Also the Ljung–Box test indicates there is correlation up to 10 lags in the data.
The next step is to subject the residuals of the model to the battery of the five nonlinearity tests. All the test statistics reject the null of *iid* residuals of the RW model. This indicates that the data generating mechanism (DGP) is non-linear. We, therefore, reject the random walk as an adequate characterization of returns in our sample of Central and Eastern European countries. The presence of nonlinearities in the series could imply evidence of return predictability. The autocorrelation in returns entail the usage of a long memory model.

TABLE 2. Estimates of the Random Walk Model

	Romania	Hungary	Czech Republic	Poland	Slovenia	Bulgaria	Slovakia	Croatia
μ	0.000514212	0.00061236**	0.0000494	0.0008648**	0.000283748	0.000496225	0.000201002	0.000275431
	(0.0003559)	(0.0002448)	(0.0002282)	(0.0003123)	(0.0001867)	(0.0003700)	(0.0002459)	(0.0003325)
LB	13.7266	50.9805***	20.4634**	44.2906***	65.6439***	62.1747***	141.829***	55.4087***
ML	677.557***	1166.92***	1957.81***	2278.89***	1699.83***	200.053***	756.629***	651.357***
LM	124.13***	177.57***	240.43***	264.48***	241.28***	39.492***	145.06***	94.962***
TAR	27.3721***	6.43308***	20.6239***	9.93839***	13.4531***	0.444321	11.5445***	10.656***
HP	1880.36***	6523.84***	16852.4***	6474.48***	4847.66***	2350.68***	19253.4***	5229.48***
BDS	20.427***	20.290***	18.637***	20.193***	32.877***	19.804***	11.342***	12.465***

Source: authors calculations

*Notes: *, **, and *** denotes statistical significance at 10%, 5%, and 1% levels respectively; μ is the estimated mean of eq. 1; standard errors are reported in paranthesis; LB is the Ljung-Box test statistic for autocorrelation up to 10 lags; ML is the McLeod-Li test statistic for ARCH effects up to 5 lags; LM is the Engle LM test statistic for GARCH effects up to 5 lags; TAR is the Tsay test statistic for quadratic serial dependence with k=2; HP is the Hinich-Patterson bicovariance test for third order serial dependence; BDS is the Brock et al. test statistic for serial independence with embedding dimension equal to 2.*

B. Non parametric tests for long memory

Table 3 presents the results concerning the nonparametric and the semi-parametric tests employed for testing the long memory property.

TABLE 3. Non parametric tests for long-memory

	GPH		R/S statistic	
	estimate	t-statistic	LR/S	CR/S
Romania	0.0763**	2.5310	1.9952**	1.7693**
Hungary	0.0414**	2.1082	1.6680*	1.4144
Czech Republic	0.0381**	2.1480	1.9135**	2.1382***
Poland	0.0452**	1.9567	2.0452***	2.1270***
Slovenia	0.0533**	2.1672	1.3055	1.3416
Bulgaria	0.0568**	1.9463	2.5151***	2.2921***
Slovakia	0.1576***	6.8561	2.2924***	2.0699***
Croatia	0.0819**	2.4357	2.0887***	2.1989***

SOURCE: authors calculations

*Notes: *, **, and *** denotes statistical significance at 10%, 5%, and 1% levels respectively; GPH stands for the log-peridogram based estimation method of Geweke and Porter-Hudak (1983); LR/S and CR/S are Lo (1991) and Cavaliere (2000) modified R/S statistics computed using the Quadratic Spectral kernel*

The fractional differencing parameters estimated using the semi-parametric method of Geweke and Porter-Hudak (1983) are statistically significant. Also, the modified R/S statistics suggest the presence of the long memory property in the analyzed financial markets.

C. The ARFIMA long memory model

The *ARFIMA(0,d,0)* model estimates (2) are presented in Table 4. The fractional differencing parameter, *d*, is statistically different from zero for all the countries, implying the presence of long memory in the mean equation of stock index returns.

However, the nonlinearity test statistics reject the null of *iid* residuals of the *ARFIMA(0,d,0)* model (Table 4) for all the countries. The results of the McLeod and Li and Engle LM tests entail the usage of GARCH type stochastic processes to account for volatility clustering.

D. The ARFIMA - FIGARCH Model

As seen from the ARFIMA model, the lagged returns are significant in all countries implying that past information is useful in predicting the future path of prices evidence inconsistent with the EMH. However, this argument neglects the joint hypothesis of volatility clustering, a problem arising in all empirical efficiency studies. Schwaiger (1995) showed that GARCH in stock returns may be the result of rational and hence efficient equilibrium pricing. Time varying volatility models would be informative about weak form efficiency to the extent that conditional variances help in predicting future returns (Millionis and Moschos, 2000).

TABLE 4. Estimates of the Long Memory Model

	Romania	Hungary	Czech Republic	Poland	Slovenia	Bulgaria	Slovakia	Croatia
d	0.0753067***	0.0581023***	0.0698543***	0.154052***	0.170140***	0.0470623***	0.0782052***	0.0617062***
	(0.01384)	(0.01130)	(0.01264)	(0.01318)	(0.01407)	(0.01376)	(0.01121)	(0.01644)
LB	14.8867	64.5306***	40.9763***	130.842***	173.612***	56.9144***	78.3906***	51.8928***
ML	661.429***	1092.42***	2022.86***	2392.48***	1738.54***	186.779***	649.204***	655.182***
LM	116.28***	166.02***	249.85***	277.90***	244.72***	37.803***	120.74***	96.504***
TAR	33.3086***	10.6095***	26.6977***	8.02292***	24.4163***	0.547683	3.68119**	16.5295***
HP	2006.37***	6499.66***	17939.2***	4783.57***	5023.51***	2340.07***	14898.6***	5409.64***
BDS	19.147***	20.644***	17.860***	18.857***	27.349***	19.475***	12.211***	12.471***

Source: authors calculations

*Notes: *, **, and *** denotes statistical significance at 10%, 5%, and 1% levels respectively; d is the estimatee long memory parameter in eq. 2; standard errors are reported in paranthesis; LB is the Ljung-Box test statistic for autocorrelation up to 10 lags; ML is the McLeod-Li test statistic for ARCH effects up to 5 lags; LM is the Engle LM test statistic for GARCH effects up to 5 lags; TAR is the Tsay test statistic for quadratic serial dependence with k=2; HP is the Hinich-Patterson bicovariance test for third order serial dependence; BDS is the Brock et al. test statistic for serial independence with embedding dimension equal to 2.*

TABLE 5. Estimates of the ARFIMA - FIGARCH Model

	Romania	Hungary	Czech Republic	Poland	Slovenia	Bulgaria	Slovakia	Croatia
d_1	0.093461***	0.071033***	0.115510***	0.092436***	0.197357***	0.102626***	0.010609	0.076643***
	(0.016603)	(0.012205)	(0.014990)	(0.014136)	(0.020196)	(0.017096)	(0.0087552)	(0.018189)
w	0.354802***	0.184077***	0.137056***	0.318888***	0.040880***	0.131333***	0.391105***	0.219080***
	(0.088204)	(0.039887)	(0.031359)	(0.043367)	(0.012089)	(0.049096)	(0.11085)	(0.065315)
d_2	0.403758***	0.288759***	0.293134***	0.252107***	0.377627***	0.444604***	0.273389***	0.333085***
	(0.030913)	(0.016667)	(0.015941)	(0.017570)	(0.020734)	(0.030083)	(0.020442)	(0.039606)
v	4.547361***	5.842363***	6.796420***	7.471646***	5.474219***	3.698250***	2.707462***	4.052594***
	(0.32813)	(0.42115)	(0.59654)	(0.78351)	(0.37126)	(0.20191)	(0.084258)	(0.35005)
LB	14.3539	17.5453*	21.8344*	21.9083*	137.198***	10.4994	5.98207	15.9654
ML	5.44697	1.32241	14.5040*	6.65317*	2.55969	2.11005	3.86460	2.70792
LM	0.64144	0.26579	3.0049*	3.8412*	0.50380	0.42529	0.77946	0.24977
TAR	1.36973	3.70768**	1.5819	2.03592	1.672	1.90269	0.856455	0.46682
HP	358.479*	491.596	448.354**	461.293*	401.815	282.752*	410.456	187.775
BDS	0.47994	-1.1179	-3.0573***	-3.7285***	-0.0966	0.41802	0.10924	-1.4000

Source: authors calculations

*Notes: *, **, and *** denotes statistical significance at 10%, 5%, and 1% levels respectively; d1, w, d2, and v are the estimated parameters in eq. 3; standard errors are reported in paranthesis; w and its std. error have been multiplied by 10^4; LB is the Ljung-Box test statistic for autocorrelation up to 10 lags; ML is the McLeod-Li test statistic for ARCH effects up to 5 lags; LM is the Engle LM test statistic for GARCH effects up to 5 lags; TAR is the Tsay test statistic for quadratic serial dependence with k=2; HP is the Hinich-Patterson bicovariance test for third order serial dependence; BDS is the Brock et al. test statistic for serial independence with embedding dimension equal to 2.*

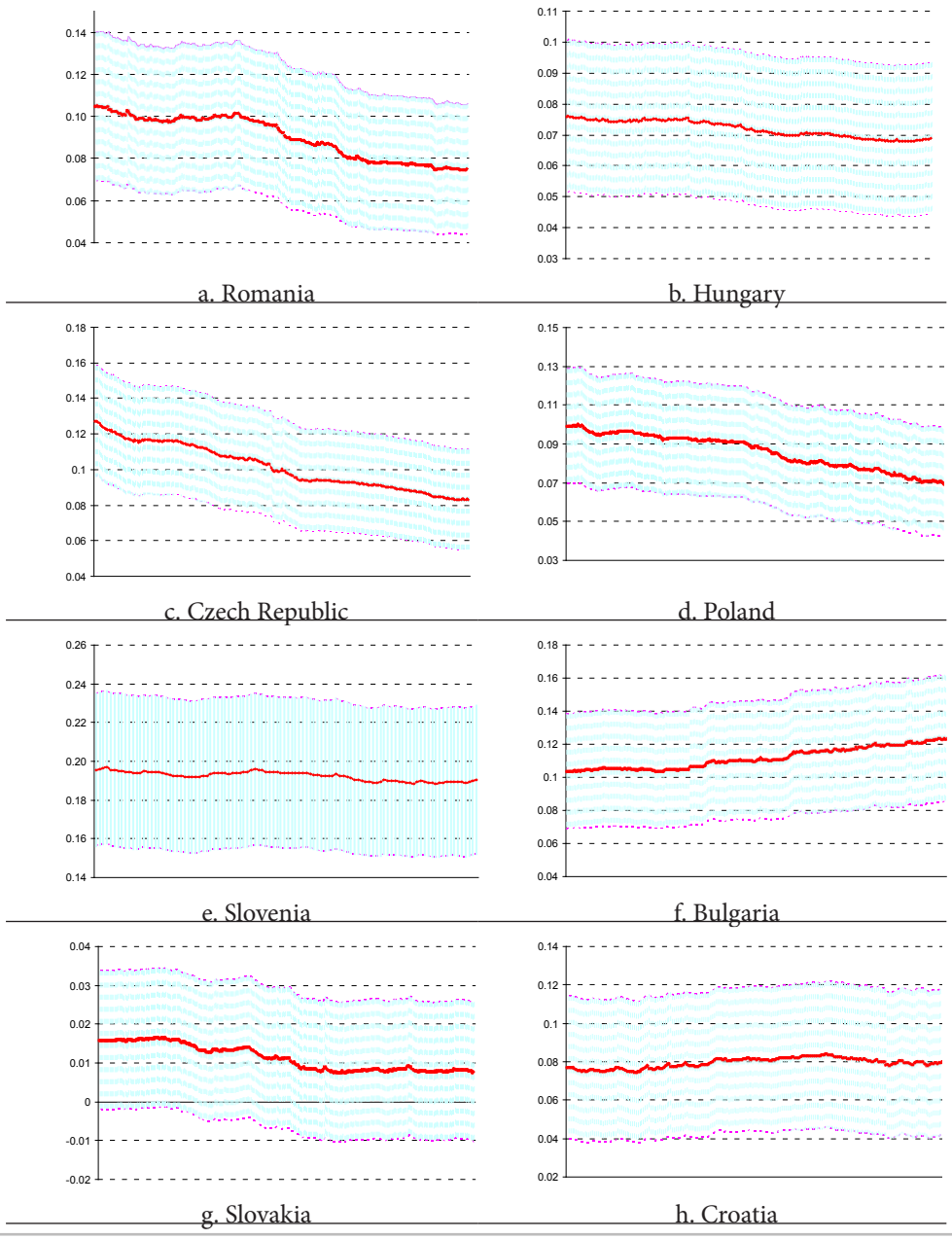
Our methodology consists in estimating different specifications for the variance equation (the basic GARCH specification, an EGARCH specification, and an FIGARCH specification). The Student *t*-distribution was employed for the all the GARCH estimates to allow for heavy tails (given the evidence from Table 1). For all the analyzed emerging economies an $ARFIMA(0,d_1,0)-FIGARCH(0,d_2,0)$ was the best specification, according to the information criteria. The best model specification estimates (3) are presented in Table 5.

For all the countries, the battery of nonlinearity test can not reject the null of *iid* residuals of the best specification (Table 5), implying that this model accounts for all the nonlinearities in the data.

Figure 1 depicts the dynamics of the long memory parameter in the returns in the eight emerging economies, as well as the 95% confidence bands. A rolling window estimation procedure was employed. The rolling window length is 90% of the whole sample size. To obtain the dynamics of the long memory parameter in the returns (*i.e* in the mean equation), the ARFIMA-FIGARCH model was employed with the parameters of the variance equation fixed to the values estimated for the whole sample.

THE DYNAMICS OF THE LONG MEMORY PARAMETER

FIGURE 1



SOURCE: Author

The parameter is consistently greater than zero for the period analyzed, except for Slovakia, implying the presence of long memory in the stock index returns for the seven remaining countries. The long memory parameter is decreasing in Romania, Czech Republic, and Poland and increasing in Bulgaria. For the rest of the countries it is relatively stable over the analyzed period.

IV. CONCLUDING REMARKS

This paper has examined the long memory property of stock returns and its implications using daily index returns for eight Central and Eastern European emerging economies (Romania, Hungary, Czech Republic, Poland, Slovenia, Bulgaria, Slovakia, and Croatia). Random Walk, ARFIMA, semi-parametric and different GARCH models were estimated and a battery of nonlinearity tests for the null of *iid* residuals was employed in all cases.

The random walk model was rejected for all the countries. Since volatility clustering is present in the analyzed index returns, one has to consider the hypothesis of heteroskedasticity. A series of different GARCH models specifications were estimated, the most appropriate one being a long memory specification, $ARFIMA(0,d_1,0)-FIGARCH(0,d_2,0)$. The estimated fractional differencing parameter in the mean equation is statistically significant in seven of the eight emerging economies employed in the study, implying the presence of long memory in the returns in these financial markets.

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DUGOROČNO PAMĆENJE U PRINOSU ISTOČNOEUROPSKIH FINANCIJSKIH TRŽIŠTA

SAŽETAK

Ovaj rad istražuje svojstvo dugoročnog pamćenja prinosa dionica i njegove implikacije koristeći dnevni indeks prinosa za osam CEE tržišta u nastajanju: Rumunjsku, Mađarsku, Češku, Poljsku, Sloveniju, Bugarsku, Slovačku i Hrvatsku. Testiranje dugoročnog pamćenja je izvedeno korištenjem više neparametarskih metoda kao i nekoliko parametarskih modela dugoročnog pamćenja. ARFIMA-FIGARCH model se pokazao kao najprikladnija specifikacija s obzirom da testovi nelinearnosti ne mogu odbaciti nul-hipotezu neovisnih i identično distribuiranih rezidua, implicirajući činjenicu da je ova specifikacija odgovorna za nelinearnost podataka. Procijenjeni frakcijski parametar diferenciranja je statistički značajan u sedam od osam ekonomija u nastajanju koje su istražene u radu, sugerirajući prisutnost dugoročnog pamćenja prinosa na ovim financijskim tržištima.

Ključne riječi: *dugoročno pamćenje, ARFIMA, FIGARCH, nelinearnost, tržišta u nastajanju*

INTERDEPENDENCE BETWEEN THE SLOVENIAN AND EUROPEAN STOCK MARKETS – A DCC-GARCH ANALYSIS

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- return comovement
- stock market volatility

ABSTRACT

This paper examines the comovement and spillover dynamics between the Slovenian and some European (the UK, German, French, Austrian, Hungarian and the Czech) stock market returns. A dynamic conditional correlation GARCH (DCC-GARCH) analysis is applied to returns series of representative national stock indices for the period from April 1997 to May 2010 to answer the following questions: i) Is correlation (comovement) between the Slovenian and European stock markets time-varying; ii) Are there return and volatility spillovers between European and Slovenian stock markets; iii) What effect did financial crises in the period from April 1997 to May 2010 have on the comovement between the investigated stock markets? Results of the DCC-GARCH analysis show that comovement between Slovenian and European stock markets is time-varying and that there were significant return spillovers between the stock markets. Financial crises in the observed period increased comovement between Slovenian and European stock markets.

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I. INTRODUCTION

International stock market linkages are of great importance for the financial decisions of international investors. Since the seminal works of Markowitz (1958) and the empirical evidence of Grubel (1968), it has been widely accepted that international diversification reduces the total risk of a portfolio. This is due to non-perfect positive comovement between the returns of portfolio assets. Increased comovement between asset returns can therefore diminish the advantage of internationally diversified investment portfolios (Ling and Dhesi, 2010).

Modeling the comovement of stock market returns is a challenging task. The conventional measure of market interdependence, known as the Pearson correlation coefficient, is a symmetric, linear dependence metric (Ling and Dhesi, 2010), suitable for measuring dependence in multivariate normal distributions (Embrechts et al., 1999). However, correlations may be nonlinear and time-varying (Xiao and Dhesi, 2010; Égert and Kočenda, 2010). Also, the dependence between two stock markets as the market rises may be different than the dependence as the market falls (Necula, 2010). It only represents an average of deviations from the mean without making any distinction between large and small returns, or between negative and positive returns (Poon et al., 2004). A better understanding of stock market interdependencies may be achieved by applying econometric methods: Vector Autoregressive (VAR) models (Malliaris and Urrutia, 1992; Gilmore and McManus, 2002), cointegration analysis (Gerrits and Yuce, 1999; Patev et al., 2006), GARCH models (Tse and Tsui, 2002; Bae et al., 2003; Égert and Kočenda, 2010; Cho and Parhizgari, 2008) and regime switching models (Garcia and Tsafack, 2009; Schwender, 2010). Among them, the GARCH (Generalized Autoregressive Conditional Heteroskedasticity) models gained a lot of popularity.

The GARCH models are used to analyze the volatility of individual assets (Bollerslev et al.; 1994; Palm, 1996; Shephard, 1996), while international investors are more interested in comovement and spillovers between the assets (or markets). A time-varying comovement between assets (or markets) can be effectively analyzed by multivariate GARCH (MGARCH – Multivariate Generalized Autoregressive Conditional Heteroskedasticity) models (Tse and Tsui, 2002; Bae et al., 2003; Égert and Kočenda, 2010; Cho and Parhizgari, 2008; Xiao and Dhesi, 2010; Égert and Kočenda, 2010).

There are several MGARCH models[3], of which the DCC-GARCH (Dynamic Conditional Correlation GARCH) models have greatly increased in popularity. They offer both the flexibility of univariate GARCH models and the simplicity of parametric correlation in the model (Swaray and Hamad, 2009). They are an extension of CCC-GARCH (Constant Conditional Correlation GARCH) models (Silvennoinen et al., 2005). More DCC-GARCH models have been developed: the version by Engle (2002), the version by Engle and Sheppard (2001), the model by Tse and Tsu (2002), a model by Christodoulakis and Satchell (2002), a model by Lee et al. (2006).

The paper aims to answer these question i) Is correlation (comovement) between the Slovenian and European stock markets time-varying; ii) Are there return and volatility spillovers between European and Slovenian stock markets; iii) What effect did financial crises

[3] An overview of the MGARCH models can be found in Bauwens et al. (2006), Silvennoinen and Teräsvirta (2009) or Linton (2009).

in the period from April 1997 to May 2010 have on the comovement between the Slovenian and European stock markets? These questions will be answered by applying a DCC-GARCH model of Engle and Sheppard (2001).

II. THE DCC-GARCH MODEL

The DCC-GARCH model of Engle and Sheppard (2001) assumes that returns from k assets are conditionally multivariate normal with zero expected value of return (r_t)[2] and covariance matrix H_t. Returns of the asset (stocks, stock indices), given the information set available at time $t-1$ (ξ_{t-1}), have the following distribution[4]:

$$r_t|\xi_{t-1} \sim \boldsymbol{N(0,H_t)} \tag{1}$$

and

$$H_t \equiv D_t R_t D_t \tag{2}$$

where D_t is a $k \times k$ diagonal matrix of time varying standard deviations from univariate GARCH models with $\sqrt{h_{it}}$ on the i-th diagonal, and R_t is the time varying correlation matrix.

The loglikelihood of this estimator is written as:

$$L = -\frac{1}{2}\sum_{t=1}^{T}(k\log(2\pi) + 2\log(|D_t|) + \log(|R_t|) + \varepsilon' R_t^{-1}\varepsilon_t), \tag{3}$$

where $\varepsilon_t \sim \boldsymbol{N(0,R_t)}$ are the residuals standardized by their conditional standard deviation. Elements of the matrix D_t are given by a univariate GARCH model (Engle and Sheppard 2001)

$$h_{it} = \omega_i + \sum_{p=1}^{P_i}\alpha_{ip} r_{it-p}^2 + \sum_{q=1}^{Q_i}\beta_{iq} h_{it-q} \tag{4}$$

for $i = 1,2,...,k$ (variables, in our case stock indices), with the usual GARCH restrictions (for non-negativity and stationarity $\sum_{p=1}^{P_i}\alpha_{ip} + \sum_{q=1}^{Q_i}\beta_{iq} < 1$).

Dynamic correlation structure is defined by the following equations

$$Q_t = (1 - \sum_{m=1}^{M}\alpha_m - \sum_{n=1}^{N}\beta_n)\overline{Q} + \sum_{m=1}^{M}\alpha_m(\varepsilon_{t-m}\boldsymbol{\varepsilon'_{t-m}}) + \sum_{n=1}^{N}\beta_n Q_{t-n} \tag{5}$$

[4] The description of the DCC-GARCH models is from Engle and Sheppard (2001). The same notations as by the authors are used.

$$R_t = Q_t^{*-1} Q_t Q_t^{*-1} \tag{6}$$

where M is the length of the innovation term in the DCC estimator, and N is the length of the lagged correlation matrices in the DCC estimator ($\alpha_m \geq 0,\ \beta_n \geq 0,\ \sum_{m=1}^{M} \alpha_m + \sum_{n=1}^{N} \beta_n < 1$).

$\overline{Q}$ is the unconditional covariance of the standardized residuals resulting from the first stage estimation and Q_t^* is a diagonal matrix composed of the square root of the diagonal elements of Q_t:

$$Q_t^* = \begin{bmatrix} \sqrt{q_{11}} & 0 & 0 & \cdots & 0 \\ 0 & \sqrt{q_{22}} & 0 & \cdots & 0 \\ \vdots & \vdots & \vdots & \vdots & \vdots \\ 0 & 0 & 0 & \cdots & \sqrt{q_{kk}} \end{bmatrix} \tag{7}$$

The elements of the matrix R_t are:

$$\rho_{ijt} \equiv \frac{q_{ijt}}{\sqrt{q_{ii} q_{jj}}} \tag{8}$$

The DCC-GARCH model is estimated in two stages. In the first stage univariate GARCH models are estimated for each residual series, and in the second stage, residuals, transformed by their standard deviation estimated during the first stage, are used to estimate the parameters of the dynamic correlation. More specific, the parameters of the DCC-GARCH model, θ, are written in two groups: $(\phi_1, \phi_2, ..., \phi_k, \psi) = (\phi, \psi)$, where the elements of ϕ_i correspond to the parameters of the univariate GARCH model for the i-th asset series, $\phi_i = \omega_i, \alpha_{1i}, ..., \alpha_{P_i i}, \beta_{1i}, ..., \beta_{Q_i i}$.

In empirical applications, normally a bivariate DCC(1,1)-GARCH(1,1) model is estimated, with two financial assets, $r_{1,t}$ and $r_{2,t}$ (Engle, 2002; Lebo and Box-Steffensmeier, 2008; Égert and Kočenda, 2010).

To estimate a DCC(1,1)-GARCH(1,1) model of stock indices return comovements, we first estimate a VAR (Vector Autoregressive) model:

$$r_{1,t} = \mu_1 + \sum_{i=1}^{p} a_{1,i} r_{1,t-i} + \sum_{i=1}^{p} b_1 r_{2,t-i} + \varepsilon_{1,t} \tag{9}$$

$$r_{2,t} = \mu_2 + \sum_{i=1}^{p} a_{2,i} r_{2,t-i} + \sum_{i=1}^{p} b_{2,i} r_{1,t-i} + \varepsilon_{2,t} \quad (10)$$

and then, using residuals of the VAR model, estimate a DCC(1,1)-GARCH(1,1) model:

$$\begin{aligned} h_{it} &= \omega_i + \alpha_{i1} r_{it-1}^2 + \beta_{i1} h_{it-1} \\ Q_t &= (1 - \alpha_1 - \beta_1)\overline{Q} + \alpha_1(\varepsilon_{t-1}\varepsilon_{t-1}') + \beta_1 Q_{t-1} \end{aligned} \quad (11)$$

III. EMPIRICAL RESULTS

A. Data

Stock indices returns are calculated as differences of logarithmic daily closing prices of indices ($\ln(P_t) - \ln(P_{t-1})$), where P is an index price). The following indices are considered: LJSEX (for Slovenia), ATX (for Austria), CAC40 (for France), DAX (for Germany), FTSE100 (for the UK), BUX (for the Hungary) and PX (for the Czech Republic). The period of observation is April 1, 1997 – May 12, 2010. Days of no trading on any of the observed stock market were left out. Total number of observations amounts to 3,060 days. Data sources of LJSEX, PX and BUX indices are their respective stock exchanges, data source of ATX, CAC40, DAX and FTSE100 indices is Yahoo Finance. Table 1 presents some descriptive statistics of the data. This is due to non-perfect positive comovement between the returns of portfolio assets. Increased comovement between asset returns can therefore diminish the advantage of internationally diversified investment portfolios (Ling and Dhesi, 2010).

TABLE 1—Descriptive statistics of indices return series

	Min	Max	Mean	Std. deviation	Skewness	Kurtosis
ATX	-0.1637	0.1304	0.0002515	0.01558	-0.40	14.91
CAC40	-0.0947	0.1059	0.0001206	0.01628	0.09	7.83
DAX	-0.0850	0.1080	0.0002071	0.01756	-0.06	6.58
FTSE100	-0.0927	0.1079	0.0000774	0.01361	0.09	9.30
BUX	-0.1803	0.2202	0.0004859	0.02021	-0.30	15.90
PX	-0.199	0.2114	0.0002595	0.01667	-0.29	24.62
LJSEX	-0.1285	0.0768	0.0003521	0.01062	-0.87	20.19
BUX	-0.1803	0.2202	0.0004859	0.02021	-0.30	15.90

SOURCE: Own calculations.

Notes: Skewness: The skewness of the normal distribution (or any perfectly symmetric distribution) is zero. If the statistic is negative, then the data are spread out more to the left of the mean than to the right. If skewness is positive, the data are spread out more to the right.. Kurtosis: The kurtosis of the normal distribution is 3. Fat-tailed distributions have kurtosis greater than 3; distributions that are less outlier-prone than normal distribution have kurtosis less than 3.

Jarque-Bera test (Table 2) rejects the hypothesis of normally distributed observed time series. Al indices returns are asymmetrically (left) distributed around the sample mean, kurtosis is greater than with normally distributed time series. Ljung-Box Q-statistics reject the null hypothesis of no serial correlation in stock index squared returns for all stock indices.

Since we use GARCH process to model the variance in the asset returns, we also test for the presence of the ARCH effect. The null hypothesis of no ARCH effects is rejected at 1% significance level. This suggests that GARCH parameterization might be appropriate for the conditional variance processes.

TABLE 2—Jarque-Bera, Ljung Box and ARCH effect test

	Min	Max	Mean
ATX	18,153.481***	2,759.19***	746.18***
CAC40	2,982.523***	1,495.14***	454.58***
DAX	1,635.472***	1,450.47***	436.93***
FTSE100	5,069.608***	1,939.78***	578.71***
BUX	21,260.91***	931.89***	331.68***
PX	59,654.928***	1,773.01***	686.37***
LJSEX	38,073.932***	927.09***	391.37***

SOURCE: Own calculations.

*Notes: Jarque-Bera statistics: *** indicate that the null hypothesis (of normal distribution) is rejected at the 1% significance (** that null hypothesis is rejected at the 5% significance and * that the null hypothesis is rejected at 10% significance. Ljung-Box Q^2 statistics ($Q^2(10)$) reports values of the statistics with 10 lags: *** indicate that the null hypothesis of no serial correlation can be rejected at 1% significance level. Engle (1988) ARCH test reports the value of LM test statistics at 5 lags included: *** indicate that the null hypothesis can be at 1% significance level.*

To test stationarity of stock index return time series Augmented Dickey-Fuller (ADF) test, Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test are applied.

The null hypothesis of KPSS test (i.e. the time series is stationary) for a model with a constant plus trend can be rejected at the 5% significance level for the return series of LJSEX and ATX. Since trend is not significantly different from zero, we give advantage to KPSS model results with no trend. For that model we cannot reject the null hypothesis of stationary process for any stock index return series (expect for LJSEX) at the 1% significance level. The null hypothesis of PP and ADF tests is rejected for all stock indices. On the basis of the stationarity tests we conclude that time series of indices returns are stationary. Results of stationarity tests are presented in Table 3.

TABLE 3—Results of stationarity tests

	KPPS test (a constant + trend)	KPSS test (a constant)	PP test (a constant + trend)	PP test (a constant)	ADF test (a constant + trend)	ADF test (a constant)
ATX	0.19** (12)	0.19 (13)	-53.59*** (15)	-53.59*** (15)	- 40.60** (L=1)	- 40.61*** (L=1)
CAC40	0.11 (15)	0.25 (15)	-57.84*** (14)	-57.79*** (14)	- 36.14*** (L=2)	- 36.11*** (L=2)
DAX	0.10 (1)	0.11 (1)	-57.81*** (3)	-57.81*** (3)	- 57.69*** (L=0))	- 57.70*** (L=0)
FTSE100	0.09 (9)	0.10 (9)	-58.28*** (7)	-58.29*** (7)	-29.11*** (L=3)	- 29.11*** (L=3)
BUX	0.07 (6)	0.07 (6)	-54.30*** (6)	-54.30*** (6)	-54.30*** (L=0)	- 54.31*** (L=0)
PX	0.16* (10)	0.17 (10)	-55.02*** (10)	-55.03*** (10)	-16.68*** (L=8)	- 16.68*** (L=8)
LJSEX	0.25*** (11)	0.59** (12)	-44.10*** (0)	-43.80*** (3)	-37.23*** (L=1)	-37.13*** (L=1)

SOURCE: Own calculations.

*Notes: KPSS and PP tests were performed for two models: for a model with a constant and for the model with a constant plus trend. Bartlet Kernel estimation method is used with Newey-West automatic bandwidth selection. Optimal bandwidth is indicated in parenthesis under the statistics. For ADF test, two models are applied: a model with a constant and the model with a constant plus trend; number of lags to be included (L) for ADF test were selected by SIC criteria (30 was a maximum lag). Exceeded critical values for rejection of null hypothesis are marked by *** (1% significance level), ** (5% significance level) and * (10% significance level).*

B. DCC-GARCH conditional correlation results

Before estimating a DCC(1,1)-GARCH(1,1) model, time series have to be filtered to assure zero expected (mean) value of the time series. A bivariate Vector Autoregressive (VAR) model for the return series is used to initially remove potential linear structure between pairs of stock indices returns. Then the residuals of the VAR model are used as inputs for the DCC-GARCH model.

An important element of specifying a VAR model is to determine the optimal lag of the explanatory variables. More criteria can be used. In the empirical literature most frequently used are: SIC (Schwarz Information Criterion), HQC (Hannan-Quinn Criterion), AIC (Akaike Information Criterion), LR test (Likelihood Ratio test), FPE (Final prediction error) and BIC (Bayesian information criteria). Liew (2004), in a simulation study, compares these criteria and his findings show that the performance of the selection criteria depends on the size of the sample to which they are applied. For the small sample sizes (30 to 60 observations) best results achieve AIC in FPE criteria, whereas for larger sample sizes (120 and more observations) best results are obtained by HQC and SIC criteria. In a similar simulation study, Ashgar and Abdi (2007) find evidence that generally support findings of Liew (2004): HQC performs the best for sample sizes of 120 observations, whereas for larger sample sizes (more than 240 observations) SIC outperforms all the other criteria. On this foundation, we use SIC criteria to select the optimal lag length of the VAR model. Results of the optimal lag selection are presented in Table 4.

TABLE 4—Optimal lag in the bi-variate VAR models

	KPPS test (a constant + trend)
LJSEX-PX	1
LJSEX-BUX	1
LJSEX-ATX	1
LJSEX-CAC40	1
LJSEX-DAX	1
LJSEX-FTSE100	1

SOURCE: Own calculations.

Notes: Optimal lag is selected by SIC criteria.

The results (Table 5) show that lagged returns of PX, BUX, ATX, CAC40, DAX and FTSE100 are statistically significantly explaining LJSEX returns. Also LJSEX lagged returns statistically significant explain returns of other stock indices. This is evidence of a feedback mechanism -- return spillovers between LJSEX and other stock markets are bi-directional.

TABLE 5—Results of the VAR models for stock indices pairs

	LJSEX-PX	LJSEX-BUX	LJSEX-ATX	LJSEX-CAC40	LJSEX-DAX	LJSEX-FTSE100
A constant	0.000264	0.000248	0.000259	0.000267	0.000261	0.000270
	(1.41)	(1.33)	(1.40)	(1.44)	(1.41)	(1.46)
LJSEX (lag1)	0.20015***	0.19573***	0.17550***	0.19279***	0.19501***	0.19107***
	(10.84)	(10.84)	(9.59)	(10.85)	(10.92)	(10.73)
Other index in pair (lag1)	0.04968***	0.06093***	0.10750***	0.10089***	0.08357***	0.12169***
	(4.22)	(6.42)	(8.61)	(8.70)	(7.74)	(8.75)
	PX-LJSEX	BUX-LJSEX	ATX-LJSEX	CAC40-LJSEX	DAX-LJSEX	FTSE100-LJSEX
A constant	0.000287	0.000500	0.000255	0.000157	0.000241	0.000105
	(0.95)	(1.37)	(0.91)	(0.53)	(0.76)	(0.43)
LJSEX (lag1)	-0.08498***	-0.08646**	-0.02984	-0.07723**	-0.08633***	-0.07040***
	(-2.85)	(-2.44)	(-1.07)	(-2.73)	(-2.83)	(-2.98)
Other index in pair (lag1)	0.02106	0.02893	0.03664*	-0.02388	-0.03191*	-0.03057*
	(1.11)	(1.55)	(1.93)	(-1.23)	(-1.73)	(-1.66)

SOURCE: Own calculations.

*Notes: In parentheses under the parameter estimation, t-statistics are given. *** (**/*) denote rejection of the null hypothesis that parameter is equal to zero at 1% (5%/10%) significance level. The first index (for example LJSEX in LJSEX-PX pair) in the indices pairs represents dependent variable in a bivariate VAR model regression.*

Next, a test of Engle and Sheppard (2001) for constant correlation was applied in order to determine whether the correlation between every pair of stock indices is time-varying or not.

The hypotheses of the test are:

$$H_o = R_t = \overline{R} \tag{12}$$

$$H_1 = vech^u(R_t) = vech^u(R_t) + \beta_1 vech^u(R_{t-1}) + \ldots + \beta_p vech^u(R_{t-p}),$$

where $vech^u$ is a modified $vech$ which only selects elements above the diagonal.

The testing procedure is as follows. First the univariate GARCH processes are estimated, and then residuals are standardized. Then the correlation of the standardized residuals is estimated, and the vector of univariate standardized residuals is jointly standardized by the symmetric square root decomposition of the $\overline{R}$. Under the null of constant correlation,

these residuals should be IID with a variance covariance matrix given by I_k. The artificial regressions will be a regression of the outer products of the residuals on a constant and lagged outer products. The vector autoregression is:

$$Y_t = \alpha + \beta_1 Y_{t-1} + ... + \beta_s Y_{t-s} + \eta_t \qquad \textbf{(13)}$$

where $Y_t = vech^u\left[(\overline{R}^{-0.5} D^{-1}\varepsilon_t)(\overline{R}^{-0.5} D^{-1}\varepsilon_t)' - I_k\right]$ and $\overline{R}^{-0.5} D_t^{-1}\varepsilon_t$ is a $k \times 1$ vector of residuals jointly standardized under the null hypothesis.

Under the null hypothesis the intercept and all of the lag parameters in the model should be zero. The test can then be conducted as $\frac{\hat{\delta} X' X \hat{\delta}'}{\hat{\sigma}^2}$, which is asymptotically $\chi^2_{(s+1)}$, where $\hat{\delta}$ are estimated regression parameters and X is a matrix consisting of regressors.

The null hypothesis of constant correlation was rejected for the next stock indices pairs -- LJSEX-PX, LJSEX-BUX, LJSEX-DAX and LJSEX-FTSE100 (See Table 6). For LJSEX-ATX and LJSEX-CAC40 pairs we cannot reject the null hypothesis of constant correlation. For the former pairs, a DCC(1,1)-GARCH(1,1) model is estimated, for the later a DCC(1,1)-GARCH(1,1) and a CCC-GARCH(1,1) model.

TABLE 6—A test of constant correlation for stock indices pairs

Parameter	LJSEX-PX	LJSEX-BUX	LJSEX-ATX	LJSEX-CAC40	LJSEX-DAX	LJSEX-FTSE100
χ^2	33.7127	34.1908	9.3114	7.6732	24.7153	22.4866
p-value	0.0004***	0.0003****	0.5932	0.7422	0.0100***	0.0209**

SOURCE: Own calculations.

*Notes: A constant correlation model test of Engle and Sheppard (2001) with 10 lags is estimated. The test statistic is χ^2 with 10 +1 degress of freedom. *** denote rejection of the null hypothesis of constant correlation at 1% significance (**at 5% significance, and * at 10% significance) level..*

The results for the DCC(1,1)-GARCH(1,1) model are presented in Table 7 and for the CCC-GARCH(1,1) model in Table 8. All estimated GARCH model parameters ($\omega_{\text{LJSEX - other index}}$, $\omega_{\text{other index - LJSEX}}$, $\alpha_{\text{LJSEX - other index}}$, $\alpha_{\text{other index - LJSEX}}$, $\beta_{\text{LJSEX - other index}}$ and $\beta_{\text{other index - LJSEX}}$) are statistically significant. Conditional variance of LJSEX returns is influenced by past return innovations in the foreign index in the pair ($\alpha_{\text{LJSEX - other index}}$ and $\alpha_{\text{other index - LJSEX}}$) and by its lagged variances ($\beta_{\text{LJSEX - other index}}$ and $\beta_{\text{other index – LJSEX}}$). Statistically significant parameters $\beta_{\text{LJSEX - other index}}$ and $\beta_{\text{other index - LJSEX}}$ indicate, that volatility transmission is bi-directional between the indices in pairs (so they are transmitted to Slovenian stock market and, vice versa, from the Slovenian stock market to the other markets). The DCC parameter β is statistically significant in all cases, while α is significant only for stock indices pairs LJSEX-PX, LJSEX-BUX and LJSEX-ATX. If we also consider that $\beta > \alpha$ for all indices pairs, we can argue, that behavior of current variances is more affected by magnitude of past variances as by past return innovations. Having value β close to 1 indicates high persistance in the time series of correlation, R_t. The sum of the

DCC parameters ($\alpha+\beta$) is larger than zero (meaning that conditional correlation between the pairs of indices returns is not constant); actually, values close to 1 are observed, indicating that conditional variances are highly persistent and only slowly mean-reverting (Lebo and Box-Steffensmeier, 2008). Results of the Ljung-Box statistics do not reject the null hypothesis of no serial correlation in squared residuals of estimated DCC-GARCH model, suggesting a DCC(1,1)-GARCH(1,1) model is appropriately specified.

TABLE 7—Results of the DCC(1,1)-GARCH(1,1) model for stock market indices

	LJSEX-PX	LJSEX-BUX	LJSEX-ATX	LJSEX-CAC40	LJSEX-DAX	LJSEX-FTSE100
$\omega_{\text{LJSEX- other index}}$	4.37e-06 (3.45)***	4.50e-06 (3.54)***	4.54e-6*** (3.18)	4.40e-6*** (2.76)	4.37e-6*** (3.26)	4.43e-6*** (2.85)
$\alpha_{\text{LJSEX-other index}}$	0.3571*** (6.19)	0.3532 (5.90)***	0.3541*** (5.40)	0.3363*** (4.44)	0.3429*** (5.29)	0.3362*** (4.52)
$\beta_{\text{LJSEX - other index}}$	0.6429*** (12.37)	0.6468*** (12.42)	0.6459*** (10.83)	0.6637*** (9.53)	0.6571*** (11.37)	0.6638*** (9.88)
Ljung-Box $Q^2(10)$ statistics	12.81	14.57	16.25*	13.91	13.88	13.66
$\omega_{\text{other index - LJSEX}}$	7.55e-06*** (4.39)	1.55e-05** (2.05)	3.49e-6*** (3.76)	2.39e-6*** (2.76)	3.32e-6*** (3.06)	1.32e-6*** (3.15)
$\alpha_{\text{other index -LJSEX}}$	0.1389*** (8.60)	0.1550*** (2.66)	0.1202*** (5.72)	0.0930*** (7.01)	0.1140*** (6.83)	0.0948*** (8.09)
$\beta_{\text{other index -LJSEX}}$	0.8367*** (57.42)	0.8117*** (12.47)	0.8666*** (42.38)	0.9022*** (67.19)	0.8802*** (55.22)	0.9018*** (78.99)
Ljung-Box $Q^2(10)$ statistics	11.42	6.26	13.61	8.74	11.12*	9.77
α	0.0235*** (2.55)	0.0304*** (2.45)	0.0039** (1.70)	0.0029* (1.45)	0.0143* (1.56)	0.0169 (0.67)
β	0.9181*** (25.58)	0.8687*** (14.23)	0.9927*** (172.83)	0.9948*** (211.22)	0.9541*** (25.73)	0.9275*** (5.83)

SOURCE: Own calculations.

*Notes: Parameters $\omega_{\text{LJSEX-other index}}$, $\alpha_{\text{JSEX-other index}}$, $\beta_{\text{LJSEX-other index}}$ are estimated parameters of a univariate GARCH (1,1) model, with residuals input from the estimated bivariate Vector Autoregressive (VAR) model with LJSEX returns as dependent variable and the other index returns as explanatory variable. $\omega_{\text{other index–LJSEX}}$, $\alpha_{\text{other index –LJSEX}}$, $\beta_{\text{other index–LJSEX}}$ are estimated parameters of a univariate GARCH (1,1) model, with residuals input from the estimated bivariate Vector Autoregressive (VAR) model with LJSEX returns as explanatory variable and the other index returns as dependent variable. In parentheses under the parameter estimation, t-statistics are given: *** (**/*) denote rejection of the null hypothesis that parameter is equal zero at 1% (5%/10%) significance level. Ljung-Box $Q^2(10)$ statistics reports the value of the statistics at lag 10: ***(**/*) indicate that the null hypothesis of no serial correlation in squared residuals of estimated DCC-GARCH model can be rejected at 1% (5%/10%) significance level.*

TABLE 8—Results of the DCC(1,1)-GARCH(1,1) model for stock market indices

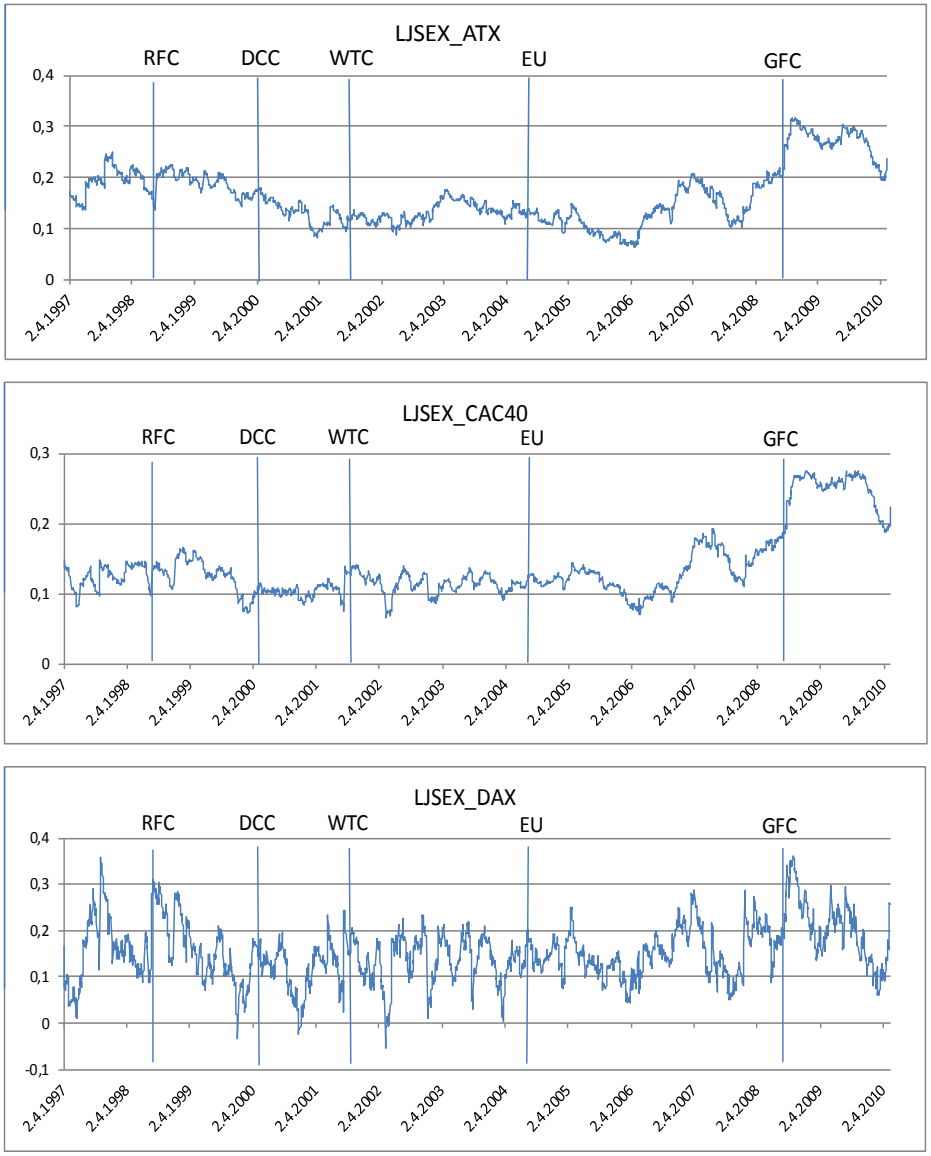
Parameter	LJSEX-ATX	LJSEX-CAC40
$\omega_{\text{LJSEX - other index}}$	4.56e-06*** (3.18)	4.40e-06*** (2.76)
$\alpha_{\text{LJSE - other index}}$	0.3541*** (5.40)	0.3363*** (4.44)
$\beta_{\text{LJSEX - other index}}$	0.6459*** (10.83)	0.6637*** (9.53)
$\omega_{\text{other index - LJSEX}}$	3.49e-06*** (3.76)	2.39e-06*** (2.76)
$\alpha_{\text{other index - LJSEX}}$	0.1202*** (5.72)	0.0930*** (7.02)
$\beta_{\text{other index - LJSEX}}$	0.866595*** (42.38)	0.9022*** (67.1917)
Constant correlation estimation	0.1678	0.1412
Parameter	LJSEX-ATX	LJSEX-CAC40

SOURCE: Own calculations.
Notes: See notes for table 7.

We can observe a highly volatile time path of conditional correlation between pairs of stock indices returns (Figure 1).

DCC-GARCH CONDITIONAL CORRELATION BETWEEN RETURN OF THE LJSEX AND OTHER EUROPEAN STOCK INDICES

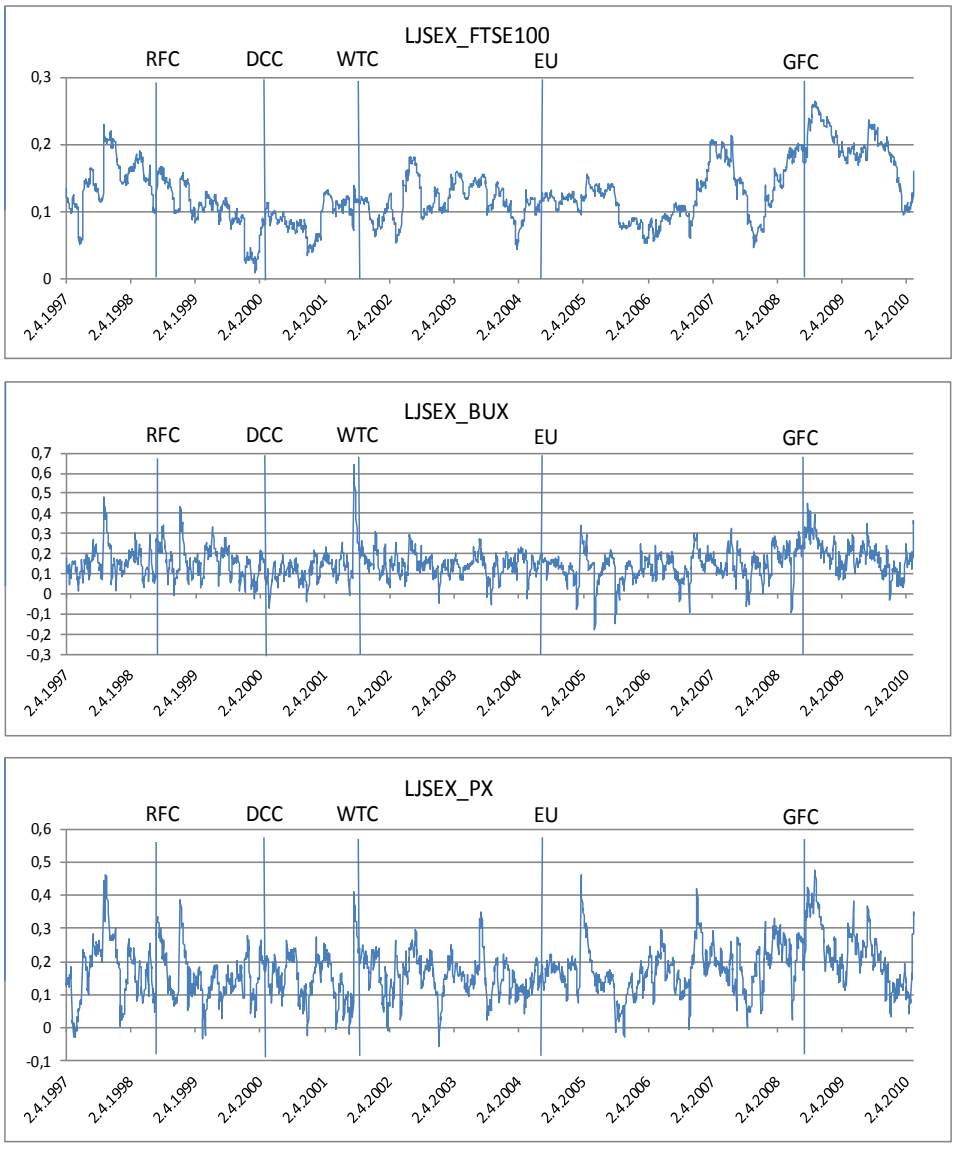
FIGURE 1



SOURCE: Author

DCC-GARCH CONDITIONAL CORRELATION BETWEEN RETURN OF THE LJSEX AND OTHER EUROPEAN STOCK INDICES (CONTINUED)

FIGURE 2



SOURCE: Author

Notes: On the time axis the financial crises are denoted: RFC = Russian financial crisis (outbreak on August 13, 1998), DCC = Dot-Com crisis (the date, March 24, 2000, is taken, when the peak of S&P500 was reached, before the dot-com crisis began), WTC = attack on WTC in New York (September 11, 2001), EU = the date when the Slovenia joined European Union (May 1, 2004), GFC = Global financial crisis (September 16, 2008). The vertical dotted lines indicate these events.

The main findings of figure 1 are the following. First of all, one can observe high volatility of conditional correlations between LJSEX and European stock indices returns, meaning correlation (comovement) between Slovenian and European stock markets returns is time-varying. The finding of time varying comovement between stock markets is in accordance with the empirical literature on measuring international stock market comovements (Forbes and Rigobon, 2002; Phylaktis and Ravazzolo, 2005; Syriopoulos, 2007; Gilmore et al., 2008; Kizys and Pierdzioch, 2009).Secondly, the trend of correlation between Slovenian and developed European stock markets (Austrian, German, French, the UK) in observed period is rising, indicating that Slovenian stock market has become more interdependent with these stock markets.

Further, comovement between Slovenian and the Central and Eastern European stock markets (PX and BUX) during the observed period was more volatile than with developed European stock markets. Considering the whole observed period, no increasing trend of conditional correlation can be confirmed between Slovenian and Central and Eastern European stock markets. Financial crises, especially the global financial crisis of 2007-2008, had a major impact on increased comovement of Slovenian stock market with European stock markets. Our findings confirm mounting evidence that correlations among international markets tend to increase when stock returns fall precipitously (Lin et al., 1994; Longin and Solnik, 1995; Karolyi and Stulz, 1996; Chesnay and Jondeau, 2001; Ang and Bekaert, 2002; Baele, 2005).

IV. CONCLUSION

In this paper the comovement and spillover dynamics between returns of the Slovenian and six European stock markets (the United Kingdom, German, French, Austrian, Hungarian and the Czech stock market) were studied. A DCC-GARCH model proved to be a statistically appropriate model to study return comovement and spillovers between these markets, and the key results obtained are: (1) Statistically significant bi-directional volatility spillovers were identified between Slovenian and European stock markets; (2) Volatilities of stock indices´ returns were more affected by magnitude of past variances as by past return innovations; (3) Conditional correlations between LJSEX and European stock indices returns in the observed period were highly volatile; (4) Comovement between Slovenian and developed European stock markets in the observed time period has generally increased (a rising trend of comovement could be indentified), while comovement with Central and Eastern European stock markets did not; (5) Financial crises, especially the global financial crisis of 2007-2008, had a major impact on increased comovement of Slovenian stock market with European stock markets.

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ODVISNOST IZMEĐU SLOVENSKOG I EUROPSKIH DIONIČKIH TRGOVA – DCC-GARCH ANALIZA

SAŽETAK

U ovom radu se analizira dinamika kretanja donosa i prijenosa volatilnosti između dioničkih trgova Slovenije i pojedinih europskih država (Velike Britanije, Njemačke, Austrije, Madžarske i Češke republike). Upotrijebljena je DCC-GARCH analiza na podacima dnevnih donosa dioničkih trgova za period između aprila 1997 i maja 2010 kako bi se odgovorilo na sledeča pitanja: i) Da li je korelacija između donosima slovenskog i europskih dioničkih trgova dinamična; ii) Postoje li prijenos donosa i volatilnosti između slovenskog i europskih dioničkih trgova; iii) Kako su financijske krize u Europi i svijetu u istraživanom periodu utjecale na korelaciju donosa dioničkih trgova? Rezultati pokazuju, kako je korelacija između donosima slovenskog i europskih dioničkih trgova dinamična i da postoje prijenos donosa i volatilnosti između slovenskog i europskih dioničkih trgova. Financijske krize su vodile u porast u međusobni odvisnosti slovenskog i europskih dioničkih trgova.

KLJUČNE RIJEČI: *DCC-GARCH, dionički trg, analiza kretanja donosa, prijenos volatilnosti*

A PROPOSAL FOR A NEW ADMINISTRATIVE-TERRITORIAL DIVISION OF THE REPUBLIC OF CROATIA

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ARTICLE INFO

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- Administrative-territorial division,
- public tasks providing,
- homogeneity,
- multivariate analysis

ABSTRACT

The article deals with a proposal of a new administrative-territorial division at regional self-government level in the Republic of Croatia. The main aim of the paper is to obtain optimal administrative -territorial division of the country which would provide optimal performance of public tasks and responsibilities at the regional level. The proposal is obtained through use of multivariate statistical methods, and it is based on a wide number of demographic, economic, and public functions indicators measured on 20 Croatian counties. The main grouping criterion is importance and representatives of identified public functions' dimensions. As a result of the analysis, seven new regions are created and they should replace the existing 20 counties. Each of the obtained regions contains counties with similar characteristics and similar capacity for public function completition.

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I. INTRODUCTION

According to the Act on the Territories of Counties, Towns and Municipalities in the Republic of Croatia (Official Gazette, No. 86/06,125/06, 46/10, 145/10) the entire territory of the Republic of Croatia is divided into 556 local government units (127 towns and 429 municipalities) and 21 counties (including Zagreb which is both town and county). Towns and municipalities comprise the level of local self-government, while counties represent the regional self-government level. The basic principles of local self-government in Croatia were established in the Constitution of the Republic of Croatia, which was adopted by the Parliament on December 22, 1990. The scope and organisation, as well as the functioning rules of those units were then defined by the Act on Local and Regional Self-Government adopted in April 2001 (Official Gazette, No 33/01; 60/01; 86/08; 125/08; 109/07) (hereinafter: the Act). County is a unit of regional self-government and it is determined as an expression of historic, economic and transport factors and represents a natural, self-government whole within the Republic of Croatia. As a rule, it comprises a number of towns and municipalities. In Croatia counties are responsible for the functions of regional character, they are engaged in operations relating to education, health care, economic development, traffic and road infrastructure, maintained of public roads, planning and development of a network of educational, scientific, social and cultural institutions, issuing of building and location permits and other activities regulated by special laws "Marković and Dunković (2009)". Main aim of regional self-government units is to provide their citizens the most satisfactory level of public services possible within their self-government competence. According to the European Commission's Report local government units and counties are addressed as not sufficiently developed for coping with assigned responsibilities "Ivan and Iov (2010)". The lack of implementation mechanisms and the lack of an efficient local and regional management were specified as key limitations. One of the reasons for inefficiency of regional (counties') management could be the existing administrative division of the country's territory into 21 counties. Namely, an inadequate administrative territorial organisation is very often stipulated as one of the facotrs which block decentralization process in Croatia. The present territorial definition of the twenty one counties (including the City of Zagreb) suffered a number of critics of functional and political nature. Initially, the process determining of the counties' territories was made without a previous analysis of the particularities and capacities each territory has in order to fulfil its obligations. During that process aforementioned legislative criteria were not addressed sufficiently, for example the boundaries of historical Croatian provinces (Dalmatia and Slavonia) were not taken into consideration "Ivanišević et all. (2001)". As a result current division does not take into consideration the natural and geographic factors, the existing economic structure, or some traditional divisions of Croatian territory, "UNDP (2003)". Problems of financing regional self government level in Croatia have been also considered by various Croatian authors "Marković and Matić (2006)"; "Jurlina-Alibegović and Slijepčević (2010)". All of them emphasised the fact that great number of local and regional units of self-government have insufficient income for executing their daily businesses, which makes such system of financing rather inefficient. Broder consequences are felt in uneven regional development in the Republic of Croatia.

II. RESEARCH METHODOLOGY

The methodology used in this work includes factor and cluster analysis. Namely in the 1970s several statistical methods were developed in order to distinguish among socio-economic features within/between regions as in "Hagget (1968)", "Berry and Rees (1969)", "Slater (1975)", "Robinson and Salih (1971)". Adelman and Morris used factor analysis for formulating predictions about which countries would develop faster than others. Their predictions were based on factor scores, which represent levels of socio-economic development, "Adelman and Morris (1967)". "Ding and Liou (2002)" investigated socioeconomic differences among small states and sub grouped them through the use of factor and cluster analysis. Each of obtained clusters contained small states with similar characteristics. Similar studies with different goals have been conducted for Portugal, "Soares et al. (2003) " and also for Croatia ("Rihtar, Rimac and Oliveira-Roca (1992)", "Rašić Bakarić (2007)", "Kurnoga-Živadinović (2007)".

Main part of the paper is focused on a design of proposals for a new administrative-territorial division of the Republic of Croatia at the regional self-government level which will provide optimal performance of public tasks and responsibilities at that level. The proposal is obtained through the use of multivariate statistical methods – factor and cluster analysis and is based on 16 indicators measured on 20 counties. Results of grouping the counties are bigger entities that will be capable to execute all assigned public tasks (provide public functions). The main grouping criterion is the relevance and the significance of different public tasks for each county which could be also described as county's capacity for completition of given public functions combined with homogeneity in socio-economic structure. Beside homogeneity additional criteria have been respected (analytic or functional criteria, socio-economic criteria like polarity or complementarily). As aresult of the analysis, seven new regions are created. Each of the obtained regions contains counties with similar characteristics and similar capacity for public function completition.

III. INPUT VARIABLES

Input variables were chosen among the set of all socio-economic and public functions indicators available at the county level. Finally, when selecting data variables the following criteria were used: the data must be readily available from existing sources for all counties; the data should be an unbiased reflection of regional (county's) conditions, the data variable should be timely and acceptable (the indicators must be accepted by those who will use and apply them and ultimately be judged on them). Hence, the data series that have been used in the analysis are ones that are available and meet the above criteria. Main disadvantage of the analysis lies in the fact that some of the selected variables do not refer to the same time period. For example data on total local budget revenues are referred to 2009, while data on GDP and economic structure are referred to 2008. The analysis was based on the last available data. The variables used in this paper consist of 16 indicators (public function indicators, socio-economic indicators). List of input variables is given in Table 1.

TABLE 1 - Description of input variables

X1	Total budget revenues of local and regional self-government units per capita (except grants from the state budget and except the share of income tax for decentralised functions, 2009
X2	Gross domestic product per capita, 2007
X3	Active legal entities as a share of total number of registered legal entities, 2008
X4	The share of primary sector in the total economy, 2007
X5	The share of secondary sector in the total economy, 2007
X6	The share of tertiary sector in the total economy, 2007
X7	The share of county and local roads in total roads, 2007
X8	Current expenditures for environmental protection per capita, 2007
X9	Kindergartens per 1000 children in the age 0 – 4 years, 2008
X10	Primary schools per capita, 2008
X11	Secondary schools per pupil, 2008
X12	Number of beds in clinics, teaching hospitals, clinical hospital centres, per capita, 2008
X13	Libraries per capita, 2008
X14	Associations per capita (sports, chess and hunting associations and bridge club; associations of cultural and artistic amateurism; technical culture association), 2008
X15	Social care homes for older and disabled per capita, 2008
X16	Average daily expenditure per prisoner (imprisonments, correctional institutions), 2008

SOURCE: Author

IV. IDENTIFICATION OF CRITERIA (USED) FOR DEFINITION AND FORMATION OF NEW ADMINISTRATIVE-TERRITORIAL UNITS

In the first part of the analysis factor analysis was used to identify a smaller number of dimensions that adequately summarise the information contained in the original set of variables. Since no prior hypothesis is made about the number and name of factors, explorative factor analysis is used. Justification for using the factor analysis implies determining whether input variables are significantly and sufficiently correlated. Only if manifest variables are correlated, can factors be identified as hypothetical components of a non-correlated variable, and sufficient for expressing manifest variables.

Table 1 in the Appendix shows the manifest variable correlation matrix. Correlation matrix indicates that each variable has at least one correlation coefficient with an absolute value higher than 0.3, which is the minimum value proposed by Kinnear and Gray (1994) as a criterion for inclusion of variables into analysis. Therefore, all eleven variables have been included into analysis. Marked in Table 1 (see Appendix) are those correlation coefficients that are significant with a significance level of 5 percent.

Since the results of factor analysis will be used as clustering variables (to which end factor scores must also be calculated), it is recommended to use the principal component analysis "Morrison, (1987)". For selecting the number of factors the eigenvalue criterion was used according to which the amount of variation explained by each factor must be larger than 1. After obtaining first unrotated solution, it was desirable to perform factor rotation. Factor

rotation allows the variance to be redistributed from the factors that are first in order to those that come later. In addition, the theory recommends varimax rotation in cases when the obtained factors are used as the basis for calculating factor scores which serve as input variables for further analyses, in this case cluster analysis "Johnson and Wichern (1992)". The factor loading matrix obtained through *varimax* rotation is shown in Table 2. For the solution to be accepted, it is necessary to examine the significance of obtained factors that represent dimensions of socio-economic development of the observed towns and municipalities. Four factors meet not only the eigenvalue criterion, but also the variance proportion criterion. In social sciences, the lowest limit of acceptability is 60 percent of variance accounted by obtained factors "Hair, Anderson and Tahtam, (1987)". This solution accounts for 76.7 percent of total variance. Four factors were obtained through *varimax* rotation of the initial solution yielded by the principal component analysis.

The first factor has a high positive factor loading on variables: X1 (total budget revenues per capita), X2 (GDP per capita), X3 (active legal entities as a share of registered legal entities), X8 (current expenditures for environmental protections per capita) and X9 (kindergartens per 1000 children in the age 0 – 4 years). This means that it positively correlates to the respective characteristics of public tasks executed by counties. On the other hand, the first factor has a high negative factor loading on X4 (the share of primary sector in the total economy) and X6 (ageing index). This factor is therefore called "strong financial and economic capacity; high share of tertiary and low share of primary sector, higher quality of preschool education, environmental care".

The second factor has a high positive loading on variables X10 (elementary schools per capita) X11 (secondary schools per pupil), X13 (libraries per capita) and X15 (social care homes for elderly and disabled persons per capita). This factor represents "higher capacities for performing public activities related to education, culture and social care".

As the third factor has a high negative loading on variables X5 (the share of secondary sector in the total economy) and X7 (the share of county and local roads in total roads) it is called "underdeveloped transport infrastructure and low significance of manufacturing activities".

The fourth factor has a high factor loading on variable X16 (average daily expenditure per prisoner) and negative on variable X14 (number of associations per capita). This factor is called "high importance of businesses related to public order and security and underdeveloped civil society".

TABLE 2 - Varimax Rotated Factor Matrix

	Factor 1	Factor 2	Factor 3	Factor 4
X1	0.797233	0.285092	0.133249	0.435436
X2	0.892458	0.302483	0.001347	0.131624
X3	0.653493	0.016233	0.264776	-0.294419
X4	-0.634010	-0.050116	-0.183341	-0.598674
X5	0.050135	-0.078369	-0.884739	0.027628
X6	0.617247	0.084937	0.546097	0.404722
X7	-0.221977	-0.198463	-0.847408	-0.265702
X8	0.708368	-0.132721	-0.276870	0.226134
X9	0.815924	0.118592	0.067507	0.084213
X10	-0.339719	0.788570	0.006954	-0.289068
X11	0.207289	0.887973	0.002905	0.243280
X12	0.488565	-0.188903	0.359185	0.032077
X13	0.297379	0.822357	0.003695	0.072124
X14	-0.043354	0.380474	-0.432964	-0.743497
X15	0.045169	0.820318	0.235724	0.052180
X16	0.131105	0.248379	-0.017307	0.785249
Expl. Var Prp.	4.367999	3.261640	2.374185	2.266515
Total	0.273000	0.203853	0.148387	0.141657

Note: Marked are loadings greater then 0.60

SOURCE: Author

V. DESIGNING OF A NEW ADMINISTRATIVE-TERRITORIAL DIVISION OF THE REPUBLIC OF CROATIA

In the second part of the analysis the counties are grouped in bigger territorial entities. Grouping is obtained through use of cluster analysis which is recognized as one of the most suitable method of classifying units into groups of similar characteristics. As input variables for cluster analysis factor scores were used. Since the factor analysis resulted in four factors, for each observed county four factor scores were calculated. The factor score indicates the extent to which each county has a high score on a group of characteristics that have a high loading on a relevant factor. This means that each county that has a high score on variables with high factor loading on one of the four obtained factors also has a high factor score on this factor.

For grouping counties into bigger units, non-hierarchical clustering method, the "k-means" method was used. The main argument in favour of this clustering method is that this method of grouping objects into clusters is more suitable when grouping units (objects) on which specific characteristics were measured, and not when grouping characteristics, i.e. variables "Johnson and Wichern, (1992)". Decision on the number of clusters is based on the analysis of variance (ANOVA).

What is characteristic for this method is that the number of clusters is defined in advance and the significance of the obtained solution is tested. In ANOVA, the significance test examines between-group variability with within-group variability when testing the hypothesis that means differ between groups. At the theoretical significance level of 5 percent, the ANOVA results for the two, three, four and five proposed clusters are not significant. The solution that groups the observed regional self-government units into six clusters can be accepted. However, at the given significance level of 5 percent and empirical significance level of 0.006343 for factor one, 0.000056 for factor two, 0.005458 for factor three and 0.000502 for factor four, hypothesis H1 is accepted, i.e. we may say that the means between the six proposed clusters differ significantly (see Table 3 ANOVA results for six clusters). The results indicating grouping of counties into six different clusters are significant. The goal to be aimed for is that means that each cluster has on an individual dimension differ significantly. As this is confirmed by the significance test in ANOVA, the same can be verified by looking at the graph of means i.e. by factor analysis identified dimensions of socio-economic development and means of an individual cluster (see Figure 1).

TABLE 3 - Analysis of Variance, six clusters

	Between SS	df	Within SS	df	F	signif. p
F1	12.39584	5	6.604157	14	5.25553	0.006343
F2	15.78522	5	3.214785	14	13.74854	0.000056
F3	12.55007	5	6.449931	14	5.44815	0.005458
F4	14.53089	5	4.469112	14	9.10393	0.000502

SOURCE: Author

TABLE 4 - Identified regional entities – Variant 1

County	Cluster		Distance
County of Zagreb	2	0.66	
County of Krapina-Zagorje	2	0.53	
County of Sisak-Moslavina	2	0.26	
County of Karlovac	2	0.24	
County of Varazdin	2	0.77	
County of Koprivnica-Krizevci	1	0.33	
County of Bjelovar-Bilogora	1	0.58	
County of Primorje-Gorski Kotar		6	0.45
County of Lika-Senj	4	0.00	
County of Virovitica-Podravina	1	0.50	
County of Požega-Slavonia	2	0.78	
County of Brod-Posavina	5	0.56	
County of Zadar	3	0.40	

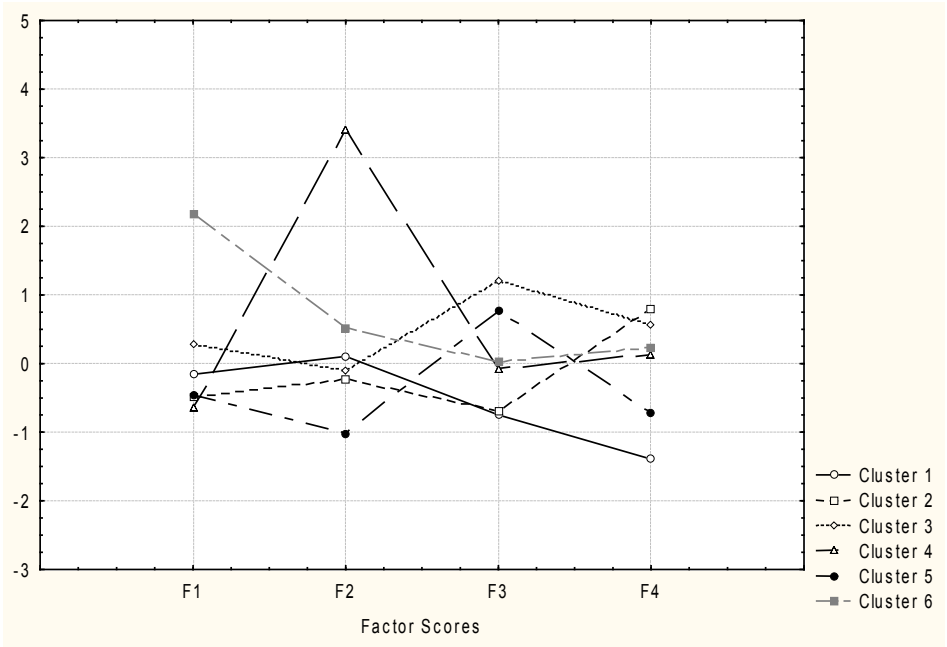
TABLE 4 - Identified regional entities – Variant 1 - continued

County of Osijek-Baranja	5	0.49
County of Sibenik-Knin	3	0.23
County of Vukovar-Sirmium	5	0.34
County of Split-Dalmatia	3	0.40
County of Istria	6	0.45
County of Dubrovnik-Neretva	3	0.69
County of Međimurje	1	0.72

SOURCE: Author

FACTOR SCORES VS. MEANS OF CLUSTERS

FIGURE 1



SOURCE: Author

The graph of means illustrates differences between obtained clusters. First region is characterised by strong negative relation to factor score 3 and factor score 4, while first two dimensions are not so significant. The most pronounced features in this cluster are low significance of activities related to public order and security, highly developed civil society, developed transport infrastructure, and grater predominance of secondary and primary sector in the economic structure. This region comprises from four counties: County of

Koprivnica-Križevci, County of Bjelovar-Bilogora, County of Međimurje and County of Virovitica-Podravina.

Second region has a strong positive relationship on the fourth factor score which represent developed functions related to public order and society activities and underdeveloped civil society (measured by associations' activities). Additionally, this spatial unit is characterised by pronounced negative relationship with third factor score, which indicates relatively better transport infrastructure roads and relatively higher predominance of secondary sector. As this region has also negative relationship to factor 1, is also characterised by relatively higher importance of primary sector in the economic structure. This region comprises from counties: County of Zagreb, County of Krapina-Zagorje, County of Sisak-Moslavina, County of Karlovac, County of Varaždin, County of Požega-Slavonia.

This region comprises four counties (County of Zadar, County of Šibenik-Knin, County of Split-Dalmatia and County of Dubrovnik-Neretva). The predominant feature of cluster 3 is the one presented by factor 3 and factor 4: low share of secondary activities in economic structure, underdeveloped transport infrastructure and relatively higher importance of activities related to public order and security. As this cluster also has a positive relationship to factor score 1, it has a relatively higher dominance of tertiary sector and GDP per capita that is slightly above national average.

Fourth region comprises only one County, County of Lika-Senj. The predominant feature in this County is the one presented by second factor: highly developed public functions related to education (elementary and secondary school) as well as culture and social care. On the other hand, negative relationship to first factor score indicates weak financial, fiscal and economic capacity, and also capacity for executing all other public tasks and responsibilities. The predominant economic activity in this cluster is agriculture, fishing and forestry.

Fifth region comprises three counties: County of Brod-Posavina, County of Vukovar-Sirmium and County of Osijek-Baranja. Unlike all the other clusters, this cluster has a negative relationship to second factor score, which indicates low potential for executing public tasks related to education, culture and social care. Also, there is a positive relationship to third factor scores, which indicates underdeveloped road infrastructure, relatively lower share of secondary sector. On the other hand, considering a negative relationship to first and forth factor score, to this group of counties we can attribute the feature of dominance of primary sector in economic structure, weak financial and fiscal, insufficient developed economic activities and activities related to environmental care and protection.

Sixth region comprises two counties: County of Istria and County of Primorje-Gorski kotar. These are the most developed Counties in Croatia. The most pronounced features in this cluster are those presented by factor one (strong positive relationship) and then by factor 2 and 3. Regarding features presented by factor 3 this cluster doesn't differentiate significantly from the national average. The predominant feature of both of the counties is strong fiscal and financial capacity and economic development potential (measured by GDP per capita and by share of active legal entities), predominance of tertiary activities, developed functions related to educations (preschool, elementary school, secondary school) developed environmental

care, high standards in executing public functions related to culture and social care.

City of Zagreb as a local self-government unit and regional self-government unit represent seventh region. According to the values of the selected input variables City of Zagreb differs significantly from other counties. Considering that City of Zagreb presents separate regional unit.

Final proposal is made as modification of first proposals (result of factor and cluster analysis). Apart from statistical criteria and homogeneity criterion this proposal is based on other additional criteria (functionality criterion, historical and geographical criterion, criterion of classification of territory for the purpose of spatial planning)[2]. It is important not only to identify similarities/differences in particular territory, but also to identify functional linkage between the spatial entities. Regarding the fact that between City of Zagreb and the County of Zagreb exists exchange of goods and services, interdependence, in the final proposal of new territorial division the County of Zagreb and City of Zagreb constitute the same region (Zagreb Region). Next modification is made in second and fifth region. County of Požega-Slavonia is moved form second to fifth region. Namely, this County is traditionally, geographically and historically connected to other Slavonian counties (which constitute region of Slavonia (functionality criterion, historical criterion). Region constituted in that way is more suitable for implementation of regional development policy. Names of the new regions are determinate according to their geographic positions. First region is called Medimurje, Podravina and Western Slavonia, second region is called Central and Northwestern Croatia, third Dalmatia (Dalmacija), fourth Lika (Lika), fifth Slavonia (Slavonija), sixth Istria, Primorje and Gorski kotar (Istra, Primorje i Gorski kotar), and sventh region is called Zagreb region (Zagrebačka regija).

TABLE 6 - Final proposal of territorial division of Republic of Croatia

New territorial entities	Counties
Medimurje, Podravina and Western Slavonia:	Koprivnica-Križevci, Bjelovar-bilogora, Međimurje, Virivitica-Podravina
Northwestern Region:	Krapinsko-Zagorje, Varaždin, Karlovaci Sisak-Moslavina
Dalmatia Region:	Zadar, Šibenik-Knin, Split-Dalmacija and Dubrovnik-Neretva
Lika Region:	Lika-Senj
Slavonia Region:	Osijek-Baranja, Brod-Posavina, Vukovar-Srijem and Požega-Slavonija
Istria, Primorje and Gorski kotar:	Istria, Primorje-Gorski kotar
Zagreb Region:	County of Zagreb, City of Zagreb

SOURCE: Author

[2] Functional regionalisation – is the delineation of a geographical area where spatial entities are grouped together because there is some functional linkage between the communities. If a town is dependent on surrounding area for its workforce then that area (municipalities, towns etc. communities that supply the workforce are linked to that particular town.

CONCLUSION

Over the past 50 years Croatia experienced a series of territorial changes (at least 12), which reflected all the sensibility, instability, overtransparence, but also the adaptability of the system. Present territorial division of the country (especially at regional government level) is one of the main problems and obstacles in relation with actual implementation of the decentralisation process "Jurlina Alibegovića and Slijepčević, (2010)". Main aim of regional self-government units should be providing their citizens the most satisfactory level of public services possible.

This paper allows consideration of more scientific approaches to classification of space into more homogeneous entities for the purpose of formulating regions. It presents the possibility of using two mathematical-statistical methods for singling out territorial entities of similar characteristics that will be more capable and efficient in performing assigned public tasks and functions. The proposal is based on following criteria: homogeneity in fiscal capacity and economic structure, functionality criterion, historical and geographical criterion, criterion of classification of territory for the purpose of spatial planning. Since, by using factor and cluster analysis methods, we have been able to single out the counties of similar characteristics, that should be more capable and efficient in performing assigned public tasks and functions, the principal aim of the paper has been obtained. A major constraint to implementing such analyses is the lack of statistics at sub national levels. Better statistical information would undoubtedly facilitate much better analyses.

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APPENDIX

TABLE 7 - Correlation matrix, input variables

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16
X1	1.00	**0.88**	0.37	**-0.77**	-0.12	**0.78**	**-0.45**	**0.58**	**0.72**	-0.13	**0.50**	**0.41**	**0.52**	-0.31	0.26	**0.50**
X2	**0.88**	1.00	**0.54**	**-0.63**	-0.02	**0.65**	-0.27	**0.64**	**0.75**	-0.02	0.44	0.32	**0.51**	-0.05	0.25	0.31
X3	0.37	**0.54**	1.00	-0.29	-0.18	0.43	-0.24	0.26	0.43	-0.18	0.16	0.20	0.01	0.05	0.19	0.03
X4	**-0.77**	**-0.63**	-0.29	1.00	-0.01	**-0.82**	**0.49**	-0.38	**-0.61**	0.33	-0.34	-0.32	-0.28	**0.54**	-0.12	-0.42
X5	-0.12	-0.02	-0.18	-0.01	1.00	**-0.49**	**0.66**	0.22	-0.07	-0.08	-0.07	-0.17	-0.01	0.26	-0.20	-0.10
X6	**0.78**	**0.65**	0.43	**-0.82**	**-0.49**	1.00	**-0.65**	0.25	**0.61**	-0.24	0.30	0.34	0.29	**-0.48**	0.14	0.40
X7	**-0.45**	-0.27	-0.24	**0.49**	**0.66**	**-0.65**	1.00	-0.06	-0.22	0.01	-0.26	-0.44	-0.33	**0.55**	**-0.45**	-0.16
X8	**0.58**	**0.64**	0.26	-0.38	0.22	0.25	-0.06	1.00	0.39	-0.43	0.06	0.35	0.21	-0.18	-0.06	0.22
X9	**0.72**	**0.75**	0.43	**-0.61**	-0.07	**0.61**	-0.22	0.39	1.00	-0.24	0.30	0.32	0.24	-0.03	0.19	0.22
X10	-0.13	-0.02	-0.18	0.33	-0.08	-0.24	0.01	-0.43	-0.24	1.00	**0.53**	-0.25	**0.52**	**0.47**	**0.50**	-0.12
X11	**0.50**	**0.44**	0.16	-0.34	-0.07	0.30	-0.26	0.06	0.30	**0.53**	1.00	-0.06	**0.76**	0.16	**0.72**	**0.47**
X12	0.41	0.32	0.20	-0.32	-0.17	0.34	-0.44	0.35	0.32	-0.25	-0.06	1.00	0.14	-0.28	-0.07	0.05
X13	**0.52**	**0.51**	0.01	-0.28	-0.01	0.29	-0.33	0.21	0.24	**0.52**	**0.76**	0.14	1.00	0.24	**0.62**	0.16
X14	-0.31	-0.05	0.05	**0.54**	0.26	**-0.48**	**0.55**	-0.18	-0.03	**0.47**	0.16	-0.28	0.24	1.00	0.14	-0.40
X15	0.26	0.25	0.19	-0.12	-0.20	0.14	**-0.45**	-0.06	0.19	**0.50**	**0.72**	-0.07	**0.62**	0.14	1.00	0.28
X16	**0.50**	0.31	0.03	-0.42	-0.10	0.40	-0.16	0.22	0.22	-0.12	**0.47**	0.05	0.16	-0.40	0.28	1.00

SOURCE: author's calculation

Note: Marked correlations are significant at p < 0.05000 N=20 (Case wise deletion of missing data)

PRIJEDLOG NOVE ADMINISTRATIVNO-TERITORIJALNE PODJELE REPUBLIKE HRVATSKE

SAŽETAK

U radu je prikazan prijedlog novog teritorijalnog ustroja jedinica regionalne samouprave Republike Hrvatske dobiven primjenom odabranih metoda multivarijatne analize na većem broju demografskih, ekonomskih i društvenih pokazatelja. Osnovni cilj rada je grupirati županije u veće prostorne cjeline, koje bi bile učinkovitije u obavljanju javnih poslova iz svog djelokruga. Prilikom formuliranja prijedloga teritorijalnog ustroja jedinica regionalne prvenstveno se vodi računa da je osnovna razvojna zadaća formirane jedinice koordinacija razvoja na svom području i kvalitetno i učinkovito obavljanje javnih funkcija. Stoga je kao osnovni kriterij za objedinjavanje županija korištena homogenost u obilježjima društvenog i gospodarskog razvoja i kapacitetima za obavljanje javnih funkcija korištena Pored toga uvažavani su i dodatni kriteriji za klasifikaciju prostora preuzeti iz stručne literature (kriterij funkcionalnosti, geografski i povijesni kriteriji, kriterij klasifikacije prostora za svrhe planiranja).

Ključne riječi: *administrativno-teritorijalni ustroj, homogenost, učinkovito obavljanje javnih funkcija, multivarijatna analiza*

COST PLANNING AND CONTROL IN CROATIAN PUBLIC SECTOR[1]

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ABSTRACT

To examine the state of managerial accounting use in Croatian public sector, the survey based on the questionnaire made was conducted in 2006 and 2011. The questionnaire was sent to 150 organizations and units in public sector and it consisted of 24 questions. The total of 123 units responded to the questionnaire in 2006, while 88 public sector units and organizations returned the answered questionnaire in 2011. In this paper the authors present empirical results of the research conducted. The results prove that cost management for purposes of cost planning and control in Croatian public sector is still undeveloped and still not sufficiently used in the process of determining budgetary spending. Also, the authors provide possible solutions for better usage of managerial accounting in Croatian public sector.

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I. INTRODUCTION

Since the end of the 20th and the beginning of the 21st century, new public management has been the most emphasized reform in the set of public sector reforms. According to Barzelay (2001), new public management is the "movement" with the goal of enhancing efficiency in public sector, strengthening responsibilities of government units toward users and buyers of its services, decreasing public expenditures, and management responsibilities' improvement and strengthening. Barzelay (2001) has written that the choice of instruments for achieving the above mentioned goals is rather similar and refers to commercializing government operations, establishing agencies (quasi corporations), outsourcing certain public sector activities and privatization, all of which change the substance and methods of work of government units and their management. The change refers to strengthening management responsibilities, the priority of measurement of input being replaced with the measurement and control of the output, improvements in methodology for success measurement, etc. (Hughes, O`Nill, 2001). According to Barzelay (2001), new public management becomes the area of political interventions inside the executive government. Further, until the scope, framework and content of government activities have not been determined, existing broad institutional rules and organizational routines used by government units for management, operations and supervision, are considered and described as public management.

Countries in transition have started to recognize the importance of management processes in public sector and to perform many public sector reform activities. According to Hughes, et al. (Hughes, O`Nill, 2001) key issues for achieving successful new public management are as following:

- managing the process of appointing the managers – responsibility of top managers is the most important one;
- development and appliance of explicit standards and performance indicators;
- viewing the control of output – results as important, not the processes;
- "breaking" government units and close monitoring of their operation, activities, and services they provide, in order to find out whether higher benefit in rendering services is achieved within or outside the public sector;
- introducing market competition into public sector – competition being key issue in lowering costs and enhancing better working standards;
- implementing managerial tools (techniques and skills) which are commonly used in private sector;
- greater discipline and more directly assigned responsibilities in using the resources (cutting direct costs, improving working discipline) – "to do more with less" approach.

Developed information system (with accounting holding the dominant position), is, among other things, the presumption for qualitative achievement of majority of the above mentioned processes. Appliance of number of cost and managerial accounting techniques and methods, and their integration into broader aspect of information technology and financial management must be put in place in order to manage public sector efficiently. Only after the above mentioned presumptions have been introduced, external and internal control of efficiency within government units shall be enabled.

II. BUDGETARY ACCOUNTING FRAMEWORK IN CROATIA

Accounting information processes and financial reporting are of a key importance for managing the budget, achieving financial responsibility at all levels of public management, and for defining, approving and carrying out government decisions. Basic elements of accounting and financial reporting systems are set in relation toward information goals. In most countries, where the main purpose of the government accounting system is to monitor the budget execution, accounting system is set on a cash accounting basis with reporting being based primarily on receipts, expenditures and changes in cash inflows and outflows and cash equivalents. Current trends in accounting systems developments are going toward partial or complete introduction of accrual accounting which provides complete information on efficient and rational use of public resources, public expenditures, as well as the information needed for monitoring public management and its responsibilities.

Following the trends, at the beginning of 2002, Croatia commenced the budgetary accounting reform, having the Budget Law (Act)[5] determining regulatory framework for budgetary accounting. Main features of such reformed budgetary accounting system, based on the regulatory framework and the reform implementation level, are the following:

- obligatory adoption of budgetary accounting and financial reporting for budgets, budgetary users and out-of budgetary users;
- obligatory use of Budgetary Chart of Accounts;
- clearly defined concepts, principles and standards, clear and prescribed procedures and rules for systematic tracking of all transactions: revenues (receipts), expenses (expenditures), assets, liabilities and resources;
- Obligatory use of budgetary classifications in budgets preparation and execution, as well as in accounting and financial reporting. The classifications are: organizational, economical, functional, location and program;
- Budgetary accounting is based on International Public Sector Accounting Standards (IPSAS);
- Application of modified accrual basis of accounting;
- Application of internationally recognized and comparable analytical framework for financial and statistic reporting;
- Financial reports are comprehensive and complete and provide information on performance and financial position;
- Obligatory periodic and annual reporting, obligatory consolidation of semiannual and annually budget of Republic of Croatia.

Having commenced the reform in 2002, Croatian budgetary accounting system started the international trend toward the implementation of accrual basis accounting. The system possesses the infrastructure that may be used for further construction towards the full adoption of international public sector accounting standards (IPSAS).

Croatian budgetary accounting reform forms part of the overall public sector reform. Budgetary accounting reform's success depends on the success of other ongoing reforming processes, but is also the precondition for the success of other reforms. Budgetary accounting reform priority is further improvement of budgetary spending monitoring as one of the most

[5] The Budget Act, Croatian Official Gazette, No. 116/2001.

important budget component, important for preparation and for supervision of the budget, as well. Croatia has developed budgetary spending monitoring throughout payments from single Treasury account (Vašiček, 2004). Budgetary process which is among the closest ones to accounting is budgetary planning. New Budget Law (Act)[6] determines modern standards for preparation, planning and monitoring the budget. Program (project) budgeting and the analysis of program's performance (benefit cost analysis) as a part of that budgetary process are a technique for improving the whole process. Programmed Budget is introduced because of the importance of having the institutionalized and complete information as a prerequisite for better decisions making (Vašiček, 2004). Government units have to make a move away from budget preparation for programs and projects towards fulfillment of projects' goals and assuring projects' quality, as well as the move from current administrative (line) approach in planning and monitoring towards fulfillment of budgetary goals in accordance to types of expenditures. Also, budgetary accounting reform has made important influence on the development of Public Internal Financial Controls System (PIFCS)[7] and external State audit. (Vašiček, 2004; Parać, 2005.)

Modified accrual basis has been enforced in government accounting since January, 2002. All Government entities have been using modified accrual basis, yet the State Budget of Croatia has been prepared on cash basis. In relation to the appliance of full accrual, modified accrual accounting basis model in Croatia is marked with following adjustments (Vašiček, D., Mrša, J., Dragija, M., 2009):

- Revenues of public sector entities are recognized when the cash is received, therefore on cash basis.
- Expenses of current non-financial assets are recognized at the time of purchase, and not at the time of actual consumption.
- The costs of procurement of fixed asset of small value are not capitalized because they are entirely recognized as expense at the time of purchase.
- The costs of procurement of fixed asset are not capitalized and are not systematically apportioned as expenses on time or functional basis during the period of their useful life. Therefore, the annual amount of asset depreciation is not calculated but the cost of the asset becomes expense in a reporting period the asset is purchased in. This principle applies to the allowances that have been given in the process of procurement as well as to investments in progress, regardless of the fact that the process of procurement is not completed, or that the asset is not ready for use.
- Increase in assets during the procurement of fixed non-financial assets without the costs (capital received donations), is not recognized as revenue but it directly increases the sources of ownership (public capital).
- Spending fixed non-financial assets during the administration estimated life is recognized as the expense of the sources of ownership (public capital) using proportional basis of value adjustment.

[6] The Budget Act, Croatian Official Gazette, No. 87/2008.

[7] European Commission, based on experience of candidate countries, developed "Public Internal Financial Control System" (PIFCS) – Internal control system (SUK) Croatian language adjusted term; used often for assessing improvements in candidate country for fulfilling the EU accession criteria.

- Residual value of fixed non-financial asset that is sold or decommissioned is not reported as an expense, and this is due to the fact that the total expense was recognized at the time of purchase.
- Change in value and volume of assets and liabilities is not reflected in the financial result but directly reflects in the value of sources of the ownership (public capital).

Thus, defined and set budget accounting system provides a significantly expanded volume of information which is primarily seen through the available information (especially in information about obligations) and through the condition and changes in the value of assets and receivables. Available information is necessary to determine the financial position of the government unit. Reliable records on these obligations are found as extremely important at the time of budget execution and treasury actions, because it enables the exercise of money control in correlation with future liabilities, and the oversight of current liabilities enables monitoring liabilities'effect on cash flow projections in the Single Treasury Account (Vašiček, V., Dragija, M., Hladika, M., 2010). A high degree of normative framework is deemed as one of the most important features of government accounting system, both in Croatia and all over the world. Since the accounting framework in Croatia has been set up as a law – based system and since governmental activities have been financed through the Budget, the legislative framework regarding governmental accounting development was determined by the Budget Act and other additional set of regulations. Those additional regulations (decrees, instructions, and policies) define and analyze certain parts of the main Act more precisely and thus enable faster and easier qualitative adoption of regulated solutions (Roje G., Vašiček V., Vašiček D. 2008). The most important legislative documents that regulate the existing Croatian government accounting system are as follows (Roje, G. Vašiček, V., Hladika, M. 2009):

- The Budget Act (Croatian Official Gazette, No. 87/2008.),
- The Policy for determining budget users and managing the Registry of budget users (Croatian Official Gazette, No.80/2004.),
- The Policy for budgetary accounting and Chart of Accounts (Croatian Official Gazette, No. 27/2005, No 127/2007.),
- The Policy for financial reporting in budgetary accounting (Croatian Official Gazette, No. 27/2005, 2/2007.),
- The Policy on budget classification (Croatian Official Gazette, No. 94/2007.).

A complete set of basic financial statements that public sector entities should assemble, according to IPSAS 1, are (IPSAS 1 Presentation of Financial Statements):

- The statement of financial position
- The statement of financial performance
- The statement of change in net assets/equity
- The cash flow statement and
- Accounting policies and Notes.

Appropriate reporting system is defined in accordance with the settled accounting information system which is based on modified accrual basis. Entities that are obliged to prepare the basic financial statements are the state budget, budgets of local and regional governments and extra-budgetary users. A complete set of financial statements comprises (Vašiček, V., Dragija, M., Hladika, M., 2010):

- The balance sheet,
- The report on changes in assets' and liabilities' volume,
- The report on revenues, expenditures, cash receipts and expenses,
- The cash flow statement, and
- The notes.

Together with preparing the aforementioned financial statements, budget users compose additional financial statements. These are:

- The statement of expenditures according to functional classification,
- The statement of liabilities, and
- The statement of revenues and expenditures of budget users (Vašiček, V., Dragija, M., Hladika, M., 2010).

According to the above, it is clear that the basic financial statements in government accounting in the Republic of Croatia are only partially complied with the basic financial statements made according to IPSASs requirements. A main difference stands in the quality of presented information as a result of different accounting basis applied. The difference is also in the existence of additional financial statements (Vašiček, V., Dragija, M., Hladika, M., 2010). The necessity of strictly determining the coverage of the general government sector is particularly evident when it comes to determining the entities who are obliged to apply government accounting. Entities that are obliged to use government accounting are defined in The Budget Act[8]. Government accounting is obliged to be used by all the state budget users,[9], and by the users of local or regional budget and their budget users. Extra-budgetary users are obliged to use government accounting only in for financial reporting. For this purpose, the registry of budgetary users based on criteria that is consistent with the requirements of the international system of the financial statistics, was established in the Republic of Croatia (Vašiček, V., Dragija, M., Hladika, M., 2010). Provisions of IPSAS have been implemented as articles of regulations, laws and ordinances that regulate the area of government accounting appliance. There is no legal obligation for the use of IPSASs, but solutions that are recommended in IPSASs are being applied in Croatian government accounting practise. All participants in the budgetary process are obliged to apply the prescribed chart of accounts and recording schemes. The appliance of the uniform methodology allows for the identification of data and general government sector financial performance indicators (Vašiček, V., Dragija, M., Hladika, M., 2010).

[8] The Budget Act, Croatian Official Gazette, No. 87/2008, article 99.

[9] According to the Policy for determining budget users and managing the Registry of budget users (Croatian Official Gazette, No.80/2004.), it is prescribed that *budgetary units* are those entities: 1. whose founder is the government and/or local government, 2. whose income source is the government budget and/or local government budget in the amount of 50% or more, and 3. who are listed in the registry of budgetary units. *Extra-budgetary users* are those entities: 1. where government and/or local government have a decisive influence on the management, 2. where one of source of founding is a dedicated income, and 3. who are listed in the registry of budgetary users. At central government level, governing ministries and their budgetary beneficiaries are covered. Among extra-budgetary units of the Republic of Croatia (at central government level) count extra-budgetary funds and some of the corporations controlled by the government. Extra-budgetary entities at local government level are only county road administrations.

III. POSSIBILITIES FOR MANAGERIAL ACCOUNTING IMPLEMENTATION IN CROATIAN PUBLIC SECTOR

A. The importance of managerial accounting and the areas of its application in the public sector

Contrary to private sector, whose performance is measured by the level of profit made, performance of individual government units and the whole public sector may be measured by level of satisfaction of general and common needs of individuals and the public. Performance has to be measured by segments and by results in each government unit. Also, each program and project has to be measured according to goal fulfillment. For long term sustainability of its activities and programs, public sector has to decrease costs and improve quality of its services. Without knowing the structure of each cost and different concepts of their valuation, decreasing costs would be "mission impossible".

According to IFAC-PSC Study 12, besides the historical role of cost accounting which may be seen as determination of inventories value or other form of assets for financial accounting needs, cost accounting has several basic managerial functions:

- Budgeting,
- Cost control and cost decreasing;
- Determination of prices and remunerations;
- Measurement of performance;
- Program assessment;
- Different choices for economic decisions. (IFAC-PSC: Perspectives on Cost Accounting for Government, Study 12, 2000)

Costs information can be used in the following specific areas (IFAC-PSC: Perspectives on Cost Accounting for Government, Study 12, 2000):

- *Budgeting and cost control*. Information about program costs can be applied as the basis for cost prediction in the budget preparation process. When budgets are adopted and performed, the costs information can be used for the next year budget preparation.
- *Effects evaluation and program assessment*. The costs measurement is the constitute part of program effectiveness and efficiencies evaluation.
- *Determination of price, fees and remunerations*. The determination of prices which government units charge for providing services (e. g. passport issuance, company registration) is partly a political question, but the quality evaluation of full costs of a provided service is necessary for comparison and evaluation of different options in business policies. The determination of prices can be necessary because of internal performance evaluation.
- *Market research*. Market research requires the comparison of costs of goods and services provided by the government units with the same ones provided by the private sector.

It is obvious that accounting goals and tasks have been evolved. In its early phases managerial accounting has been considered as technique for cost allocation on cost objects and it was mainly considered as the "problem of accountants". Today, managerial accounting in public sector is used for presenting the information on costs for the main purpose of fulfilling

managerial needs so that such information is used in management processes in public sector. Managerial accounting becomes viewed as a tool for the new public management (IFAC-PSC: Perspectives on Cost Accounting for Government, Study 12, 2000). Above mentioned areas of managerial accounting appliance are considered as benefits of using managerial accounting. However, managerial accounting is not present enough in practice of most of the countries. The differences in concepts of its use in public sector exist from country to country. It is rare that managerial accounting is being used in government units which render services for free. Insufficient use of managerial accounting in public sector is mainly due to the following:

- Certain services are free to all citizens and providing goods and services is a primary activity of government units;
- Many costs cannot be determined reliably, e.g. costs of natural resources;
- Criteria for assessment of some activities are missing even when costs are known;
- Government programs and projects are decided on political ground, costs are of a secondary importance;
- Budget uses cash accounting; the only and primary interest of the regulator is the control of budgetary resources, not occurred costs. (IFAC-PSC: Perspectives on Cost Accounting for Government, Study 12, 2000)

B. Possibilities for managerial accounting implementation in Croatian public sector

Changes in complex systems, such as public sector, are always the result of the long term, complicated and demanding processes. Political issues have the influence on these changes. Frequent changes of government management structures are deemed as being a disadvantage for the continuous public sector reform processes. Republic of Croatia often misses political consensus on reforming processes. Ongoing processes are often stopped or changed without providing clear arguments for pro and cons. Our opinion is that some formal and informal rules have to be taken into account so that the direct relation between institutionally defined program and its result exists. Perfectly designed project (program or system) with all formal elements (laws, rules and procedures) may not be successfully implemented if some informal rules are not respected.If there is no changes in behavior of the politicians, top managers, advisers and other public sector employees and if informal rules are not visible enough, no real changes will take place at all. The administrative capability of government units is currently low, and public sector with low administrative capacity cannot take the burden of such changes. Enhancement of administrative capacity means introducing the responsibility, transparency (in disclosure), and participation of everybody responsible in the process.

Currently, main risks for successful reforms are as follows: missing management integrity, inadequate management requests for professional and competent staff, inadequate allocation of responsibilities and authority which results with poor management control, low ethical values, and missing managerial policies. Thus, cost and managerial accounting implementation into public sector has to be seen in the context of the above mentioned and discussed reforming processes. Nevertheless, issues such as political aspect, administrative

capacity, organizational capacity – capability for managing changes, cultural inheritance, etc., have to be taken into account as obstacles. Benefits of managerial accounting in public sector are numerous only if managerial accounting is implemented in all areas. Managerial accounting can be implemented in both cases, whether budget uses cash basis accounting principle or accrual accounting basis principle (Adhikari et al.,2008). In case of the accrual based budget, information about costs can be used for control purposes (planned vs. used), while in case of the cash based budget costing may be useful as additional information for budgetary resources' allocation. The fact is that information about costs is insufficiently used in the process of preparing the budget in Croatia. In fact, instructions for budget preparation process do not request or imply the usage of such cost information model. Cost information is used sporadically and on voluntary basis, without recommended and prescribed procedure.

Information on cost can be used for cost reduction and control purposes. Real costs are to be compared to programs' (activities') planned costs, standard costs, costs resulting from similar programs (activities), costs in a certain time horizon, etc. The goal of the comparison made is to determine the difference in costs and cost variances, to make revisions and take adequate actions.

Cost management for such purposes is undeveloped and of limited use when determining budgetary spending. Standard costing for same or similar services i.e. cost recognition up to determined amount for each particular service, is not enough present in Croatian budgetary units accounting practice.

Managerial accounting in public sector is necessary when government units must determine the price of their services. Pricing may be needed because costs are partly recovered through fees from final users. Pricing may be needed for internal calculation, too. Canada has a practice of "cost recovery" with initiative for government units to use procedures for "cost recovery" from the budget, which stimulates them to calculate and track all occurred costs for rendering services or goods (Roje, 2008). In Republic of Croatia price service determination in practice is more a political question and certain amounts of fees have more political and social, rather than economic characteristics.

Managerial accounting used for project evaluation helps in making decision about the authorization of project, project prolongation or cancelation, as well as project changes. Lack of data on project's cost makes deciding about the actual project even harder. Republic of Croatia accepted project planning which express costs primarily according to determined programs and program drivers, and only secondarily according to types of expenses. Programmed budgeting is concerned with activities' and projects' results. Problems of full implementation of planned programs are connected with the fact that several answers have to be provided for each program. Namely, these are: what the goal is, how much this program costs, which are the beneficiaries and how results shall be measured. Set future requests for program budgeting are different than the current ones. Yet, answers on asked questions have to be provided, which is not an easy task.

Measurement of government units operation may be connected with program evaluation which is done by government units (if program budgeting is existent). Measurement of operations may be seen as equivalent for profitability measurement in private sector. However, it is hard to define and evaluate the results. Rendering the services and quality may be measured in several ways: as measuring service price – cost of inputs for rendering services or

as measuring rendering of service – outputs of conducted service. Measurement of input or output value is simpler than measurement of results i.e. performance of rendering the service in terms of quality and satisfaction. For example, it is possible to calculate the cost of the output (i.e. cost of medical surgery), but it is not completely measurable how that output will influence the final result of the service (i.e. prolonged life, decreased cost of pain relievers, etc.).

On the basis of decisions on total cost of rendered service it is possible to make strategic decisions such as is it better to conduct service through public sector or to privatize public sector?

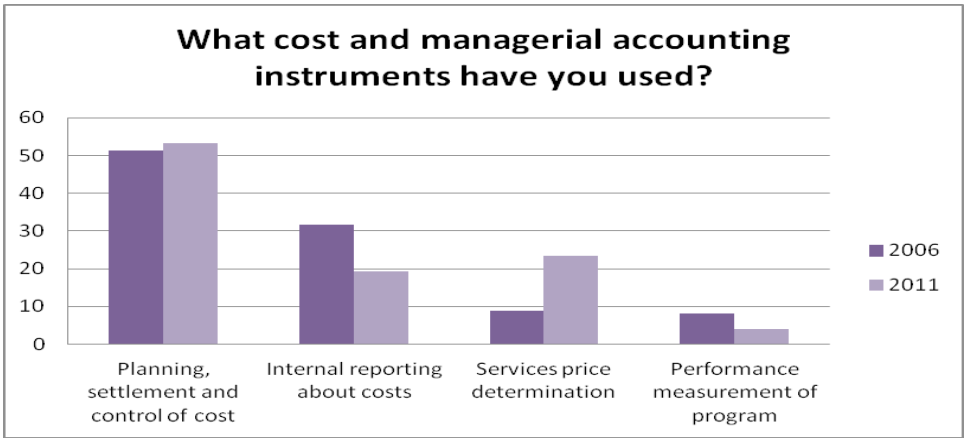
IV. EMPIRICAL RESULTS ABOUT COST PLANNING AND CONTROL IN CROATIAN PUBLIC SECTOR

Public management can use different modified set of instruments of cost and managerial accounting with a purpose of gaining information needed for evaluation and performance assessment of individual programs. Increased demands for efficient and transparent work of public authority bodies and public management impose the need for new forms of reporting which further implies the usage of the set of managerial accounting instruments. Those set of instruments cannot be avoided in following public sector management process: budgeting, cost control and cost decrease, determination of prices and remunerations, performance measurement, program assessment, choices referring to economic decisions, taking actions to increase effectiveness and to raise quality of services by decreasing costs. The fact that unique framework for public sector performance measurement is not proscribed or defined is confirmed with the questionnaire results.

To examine the state of managerial accounting use in Croatian public sector, the survey based on the questionnaire made was conducted in 2006 and 2011. The questionnaire was sent to 150 organizations and units in public sector and it consisted of 24 questions. The total of 123 units responded to the questionnaire in 2006, while 88 public sector units and organizations returned the answered questionnaire in 2011. In 2006 the structure of organizations who responded to the questionnaire was as follows: 63% were budgetary users, 36% were users of local and regional budgets while 1% were non budgetary users. In 2011 the structure was rather similar: 62% were budgetary users, 38% were users of local and regional budgets while 1% was non budgetary users. In 2006, 7% of organizations who responded to the questionnaire were government entities, 22% were local government entities, 63% were institutions, and 8% others. In 2011 the structure was a slightly different, institutions yielded the largest percentage and there was a lower portion of local government entities.

USED COST AND MANAGERIAL ACCOUNTING INSTRUMENTS

FIGURE 1



SOURCE: Author

Out of 123 units and organizations in 2006, 51,22% use cost planning, cost allocation and cost control, but only 8,13% use performance measurement and program assessment. In 2011 the percentage of performance measurement and program assessment is even lower, only 4%. Internal reporting about costs is lower in 2011 than in 2006, which is a surprising fact in research field because the reform in Croatian public sector has been trying to move forward as far as tracking and allocation of costs, as well as reporting about costs to the public management is concerned. Information about cost through internal reporting could be used to control costs and to make necessary reductions. Information on cost can be used for cost reduction and control purposes. Real costs are to be compared to programs' (activities') planned costs, standard costs, costs resulting from similar programs (activities), or to compare costs over time. Thus, valid and timely information on costs through appropriate reporting can contribute to:

• comparison of costs and possible benefits of certain programs and activities for which it is possible to establish useful and useless activity, based on what decisions can be made about the reduction or abolition of programs that are not longer deemed effective;

• comparison of costs and their changes over a given period of time, identification of causes for such costs behaviour and decisions to take various steps with a goal to improve efficiency;

• identifying and reducing excess of cost capacity;

• comparing cost with similar "benchmark" activities to find the causes of the differences in costs and to revise and improve the ongoing processes.

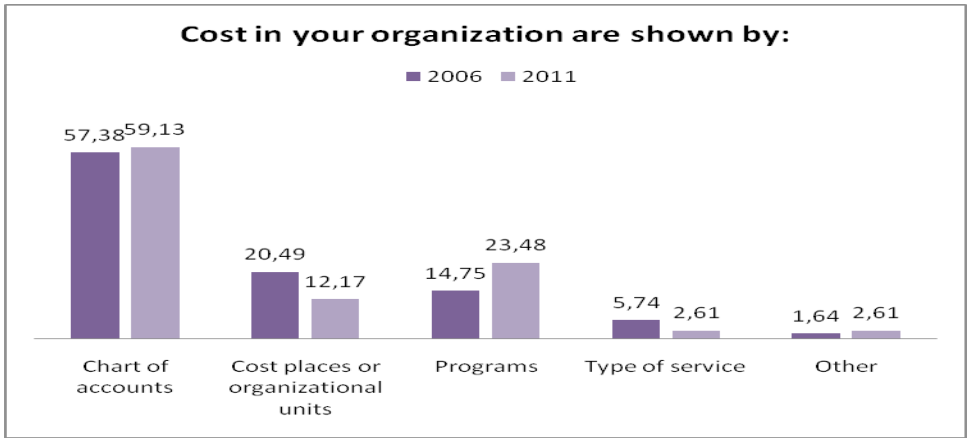
Empirical results confirm the theoretical knowledge on the subject and the fact that the use of cost and managerial accounting instruments is mostly represented in planning, settlement and cost control. The above is partly due to the fact that the area of cost planning and control is developed and regulated by law for purposes of budget planning and budget execution monitoring, and thus widely represented in all government units. However, compared to 2006,

the use of instruments of cost and managerial accounting for pricing services in organizations increased in 2011. A reduction in use of instruments is shown in the field of measuring and monitoring the success of the program. The reasons for the differences in responses of 2006 in relation to the 2011 could be partly due to the fact that the structure of the sample is different. When considering the structure of the institutions surveyed in the field, the greatest number of respondents comes from primary and secondary education and preschool education and they are using only the instruments for planning, settlement and cost control, pricing services and reporting on internal costs. However, they don't use instruments for measuring and monitoring the success of the program. Those instruments are mostly used by entities of local and regional governments.

The results of the research in 2006 year and 2011 show that the highest point on the representation of costs is in monitoring cost by natural types of costs classification. This is the expected result because of the classification being determined by the Budget Act and the cost information structured according to that classification is available for other processes too. In order to improve the planning process, calculation, allocation and cost control in the public sector, it is necessary to monitor costs not only by nature and place of origin, but also by types of programs and services. Some institutions have classification according to the programs, and some even accompanied costs by the type of funding or by functions.

SHOWN COST IN PUBLIC SECTOR INSTITUTIONS

FIGURE 2

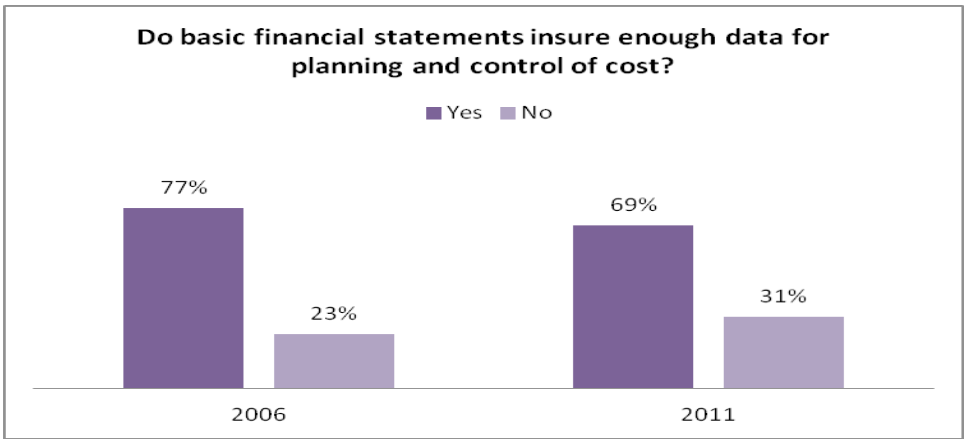


SOURCE: Author

No less important than the "production" of information, is its presentation. Presenting information about costs in the public sector is to improve the quality of governance and public management decisions. In doing so, public managers need to define the shape and form of internal reports, which provide cost information needed for effective management and decision making.

PLANNING AND CONTROL OF COST THROUGH FINANCIAL STATEMENTS

FIGURE 3

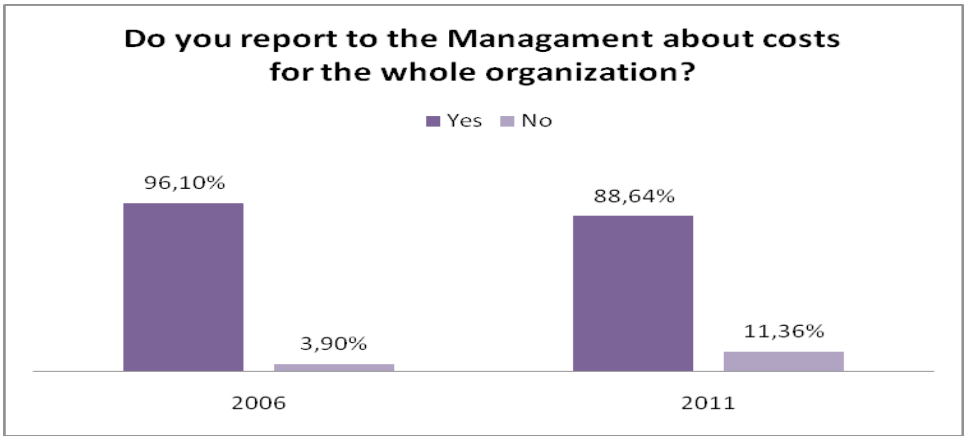


SOURCE: Author

The research showed that most of the public sector organizations in the Republic Croatia that report to the management about costs (expenditures) are doing so at the level of the organization as a whole.

REPORTING TO THE MANAGAMENT ABOUT COSTS

FIGURE 4



SOURCE: Author

Also, research in year 2006 showed that 54.87% of public sector organizations in Croatia expressed internal reporting about costs by nature, 20.35% by the programs, and 15.93% at places of origin or to organizational units. In 2011, 89% of respondents confirmed that the internal reports about costs are at the whole organization level, 52% had showed costs by nature, 16% by the programs, 24% by the places of origin or by organizational units, while

only 10% reported costs by the type of government service. Disclosed costs for planning, cost control methods and management reporting about costs shows a high concordance in costs. In terms of planning for program, information about costs of programs and activities are useful and important in the following situations:

- Preparation of budget (this does not anticipate costs incurred in past or future costs estimates);
- Program evaluations (the cost of programs is a factor in making policy decisions related to program authorization, modification and discontinuation);
- Cost control and reduction of costs (i.e. comparison of costs with known or assumed benefits of activities, identification of value-added and non-value-added activities and discontinuation of non-cost-effective activities; all these not being usual actions or practice for public entities in Croatia); and
- Setting prices and fees (information about costs is relevant even when goods and services are provided as a result of government policy decisions, such is the case in Croatia, or when prices and fees are set on the basis of market prices).

The result of combining costs with efficiency measures is the excellent evaluation process that can evaluate the following:

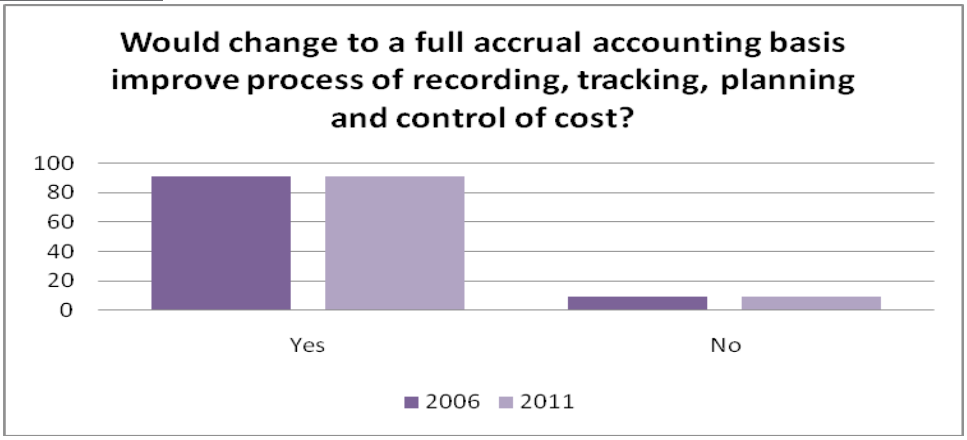
1. measurement of the different resources and costs used as inputs to provide services;
2. achievement of service as a measure of the degree in the provided services effect; and
3. relationship between invested and achieved in the process of service provision and in determining the unit cost or cost per unit of service.

The budget for programs is dealing with the expected results, activities and projects implementation. Requirements placed on developing the program budget are completely different from the previous holders of the budget, and they must provide answers to certain questions, such as: what the goal of the program is, what cost will be needed to achieve this goal, who are the beneficiaries of the program and how to measure the success of the program, which often is not easy. Use of cost accounting in the assessment program helps in deciding on authorization of the program, the continuation or termination of the program, and program amendments. The absence of data on costs sets making choices between the competing programs difficult. Performance measurement instruments' development assumes introducing cost accounting and managerial accounting instruments on the basis of developed database systems to define appropriate indicators for the specific activities of organizations in public sector. In a situation in which the instruments of cost and managerial accounting are poorly represented, development of performance measurement indicators cannot be expected.

Implementation of accruals should solve all those problems. By changing to accruals all governmental units shall be able to choose various methods for cost planning, cost allocation and cost control. In fact , 91% of respondents in both years of study agreed that the shift to the full accrual accounting would contribute to the improvement of planning, accounting and cost control.

INFLUENCE OF FULL ACCRUAL ACCOUNTING BASIS ON RECORDING, TRACKING, PLANNING AND CONTROL OF COST

FIGURE 5



SOURCE: Author

V. POSSIBLE SOLUTIONS FOR BETTER USAGE OF MANAGERIAL ACCOUNTING IN CROATIAN PUBLIC SECTOR

Information on costs plays a significant role in the management of a specific subject in both the profit and the public sector. Cost information can be used by public sector entities as an information basis for decision making (i.e. decisions on service prices, creation of new programs, new directions for a specific program, the introduction of new services, etc). Cost and managerial accounting instruments, methods, techniques and procedures can be adapted and used in public sector entities for the purpose of generating and reporting about costs for the needs of management structures. Preparation of internal reports, cost planning and control in a manner adapted to control the structures of public sector entities contribute significantly to processes aimed to improving governance in public sector. Planning and control of costs can be displayed in the modified master budget in terms of internal reporting, but also in other forms of non-standardized financial statements. Coverage costs method in the internal reporting needs to be in function of providing information for managers at different hierarchical levels, in the process of making economic and non-business decisions. Therefore, the internal reports should allow for adaption of internal users specific requirements, depending on whether they use cost information in the system of planning, performing (calculation) or control. Cost should serve as the basis for preparing and interpreting the accounting information, which is further required and needed to do the following:

- Clearly define the current and periodic information requirements of internal users at different hierarchical decision making levels, which make influence on the structure of the costs;
- Make true assessment of the personnel and technical capabilities of accounting services to meet the constant and periodic information requirements of users, while respecting the economics principles;
- Define the organizational requirements for meeting the real requirements of the selected systems and calculation methods for the current reporting on relevant cost categories, according to the methodology of determining the partial results;
- Ensure costs comparability of the similar activities at the internal, national and international level. Cost information is helpful for planning purposes and cost control is necessary to define the basic types of costs, and to set up cost system identification, data collection, monitoring, recording, classifying and analyzing, which is the integral part of accounting and the overall information system, supported by the computer technology.

Having considered the processes in public sector and the nature of the programs, we opt for Activity-Based Method as our recommendation for cost allocation. The method for cost allocation could be implemented if full accrual basis is used (this would assure that the basis for external an internal reporting is the same). In case the modified accrual basis is used, a separate model for cost tracking, allocation and internal reporting is to be set up. Hence, since very high percentage of governmental units are mostly completely financed from the state or local budgets, the government or managers of those governmental units could use price determination of services based on true data given by the cost allocation methods like Activity Based Costing method. This method allocates all occurred cost based on activities or perhaps on equivalent, which is program in Croatian public sector. Such method could enable the government to charge prices on services provided based on occurred costs. Implementation of accrual accounting and cost control into the governmental units would enable the performance measurements and program efficiency evaluation to be made on actual relevant data, and the decision making process will be based on relevant data, accordingly. Different modern methods for managing costs result in significantly different information about the costs. Based on that, the process of decision making in public sector and decision made on costs could vary. It is, therefore, very important to implement the right cost allocation method. Creating and accurately using the cost information, provided by using the set of the cost and managerial accounting instruments, would increase the quality of accounting information as the basis for public management decision making and for the supervision of public management activities. In addition, this would directly affect the service providing effectiveness and efficiency, gratifying the general and basic need.

However, every reform contains obstacles and risks. Managerial accounting may improve efficiency and assure for better management, but it is also connected with certain risks referring to its implementation. According to Dražić Lutilsky et al. (Dražić Lutilsky, Vašiček, 2007) when the goal is to successfully implement managerial accounting in public sector one has to take into account the following questions:

- Is there a strategy and are the goals determined? Have feasibility studies and different expert studies been made?

- Are all levels of management and users familiar with goals, purpose and methods of implementation of managerial accounting?
- Are all the areas of implementation defined (e.g. will the cost reports be used for budget preparation)?
- Has reengineering (redesign) of business process been done? Cost studies on the basis of programs and activities form part of the reengineering process.
- Have the needed information on costs, chosen concepts and costing methods been defined?
- Are instructions for users (manuals and studies) made available? Are the users educated for using managerial accounting?
- Are cost reports defined, are users of cost reports (managers) familiar with their content and can they be efficiently used?
- Has managerial accounting integration into financial accounting, as well as integration of cost systems among government units been ensured?

There are number of important questions and issues that must be taken into consideration when implementing managerial accounting into public sector, so the above mentioned list should not be viewed as a complete one. If "preparatory" work is not made good enough, soon the need for interventions into newly established system will emerged, which shall gather additional cost and problems for users (constant changes, loss of information etc.) (Dražić Lutilsky,Vašiček, 2007). It is also important to establish internal financial control in order to achieve external control. Public internal financial control system (PIFCS) is a tool that the management structure should use to respond to the above requirements to support the budget reforms. To ensure this, it is important that the management structure is able to understand the internal financial control system and to use it for the purpose for which it is intended. A system established under Public Internal Financial Control Act (NN 141/06) has not yet been fully exploited for the purposes they were intended to, and often represents as a "supplement" to existing management systems. In this context, "new" development strategy of PIFC for 2009-2011 has been brought (the third strategy so far). In order to set the system, up to now the strategy has been developed as a tool of the management structure that should provide responsible, transparent and successful management of budget funds.

The need for a new strategy of development of PIFC in this period stems from the budgetary reforms initiated by strategy improvement and modernization process in the State treasury 2007 - 2011 and the new Budget Law (Official Gazette 87/08). The strategy envisages that in further developing of financial management and control system the following needs to be improved:

• the awareness of financial management as an integral part of management processes and systems that permeates the entire organization;

• organizational prerequisites for the development of financial management and control, including the coordinating role of the existing finance directorates / sectors / departments and other authority levels, accepting responsibility for the realization of set objectives and for managing the budget resources needed for their implementation;

- inancial management and control of the budget cycle (planning, programming, financial plan, monitoring implementation, accounting records, internal reporting systems for financial management);
- accounting systems as the basis of quality financial information systems for financial management;
- the risk management process;
- models for assessing the financial management and control quality.

Development of financial management and control processes in the budget cycle (planning, programming, financial plan, accounting and reporting) forms part of budgetary reforms that go in the direction of: development planning and programming phases of the budget cycle, placing greater emphasis on the achievement of goals and results for the budget users, and introduction of some new approaches to budget management. It further requires the linking of financial and strategic plans, development of program planning by defining program objectives, performance indicators development and monitoring system implementation. It will therefore be important to strengthen financial management and control processes that are essential for sound management of budgetary resources, and to include the planning, programming, financial plan, implementation of financial plan, including contracting and procurement, monitoring of financial plans and systems of internal reporting. It should be noted, most of the users have not described these processes in their budget preparation books or business processes maps and that most of the budget users have not made internal procedures to govern the budget unit. Such processes should be made to ensure the development of procedures and job descriptions, define the powers and responsibilities of each participant and develop preliminary and subsequent control. This would further provide an audit trail for the monitoring of the management of budgetary resources from the planning stage (expressing the need for budgetary resources) to the stages of funds implementation and monitoring of budgetary funds invested (achieved objectives and results achieved). Rules on Budget Accounting and Chart (Official Gazette 114/2010) and Rules on Financial Reporting in the budgetary accounting (Official Gazette, 32/2011) adopted under the Budget Law (Official Gazette 87/08) regulates the accounting budget. In accordance with the Law, the established accounting systems for budget users are primarily in the function of financial accounting, and are used for external reporting. Financial accounting function is to provide a record of business events occurred, control whether the implementation of the budget in line with budgeted levels, and whether the payments previously approved by an authorized person, are made.

The development of accounting systems for internal reporting and for financial management purposes ought to include development of cost and managerial accounting. Development of the budgetary system in the manner of linking the goals, plans and budgetary resources requires the development of accounting records and reporting systems that track the links between planning documents and budget resources needed in both the planning phase and implementation phase. This involves the development of records associated with the connection between the procurement plan and financial plan, records of contracted obligations, etc., which so far under budget users has not been sufficiently developed.

Development program planning also requires further development of accounting records and financial reporting system to ensure the necessary information for the program

management, which includes information on program costs sum, types of costs, the place of cost information needed to track the set of indicators, and similar. Options for the development of cost accounting and managerial accounting will primarily be analyzed in the institutions involved in implementation of the PHARE 2006 project "Improvement of the budgetary process." Experience gained in the pilot institutions will be used for the development of accounting systems with other budget users.Development of cost accounting and managerial accounting should serve as a basis for developing sound financial and information systems for budget users.Measures that need to be taken are as follows:

• Analysis of accounting systems based on the analysis of existing accounting records and reporting systems (i.e. what accounting reports are to be made and who their users are) in the pilot institutions involved in implementation of the PHARE 2006 project "Improvement of the budgetary process".

• Identification of additional accounting records and reports should be established; deputy director of the Finance Director and other administration and chief sectors / departments and the heads of the pilot institutions should be identified. This would serve to identify possible problems in the use of accounting reports.

• Creating an Action Plan for the development of accounting systems based on the analysis made by the Finance Director.

• Central Harmonization Unit shall sett the guidelines for the development of cost and managerial accounting, based on experience gained in the development of cost and managerial accounting in the pilot institutions.

VI. CONCLUSION

Public sector reforms' success depends on how successful public sector management performance is. Key changes in public sector management reform refer to the introduction of accrual basis accounting and management based on results, which is possible to be achieved only by improving the accounting system, mainly through further development of cost accounting and financial reporting. Results of such changes are long term and broad, ensuring development based on gathering knowledge and taking responsibilities. Efficient governance of governmental units demands endorsement of numerous cost and managerial accounting techniques and methods as well as their integration in wider aspect of informatics technologies and financial governance.

The internal and external control of efficiency and effectiveness is possible only if numerous techniques and methods of cost and managerial accounting in processes of public sector and governmental units are introduced and applied. The analysis of data provided by financial, cost and managerial accounting in public sector governance processes shows that costs information have not been used on a sufficient level. Requirements for Republic of Croatia in terms of adjustments to the EU legislation and standards intrude the completion of the commenced public administration reform. Changes in complex systems, such as public sector, are always the result of the long term, complicated and demanding processes. Political

issues have the influence on these changes. Frequent changes of government management structures are deemed as being a disadvantage for the continuous public sector reform processes. Republic of Croatia often misses political consensus on reforming processes. Ongoing processes are often stopped or changed without providing clear arguments for pro and cons. Our opinion is that some formal and informal rules have to be taken into account so that the direct relation between institutionally defined program and its result exists. Perfectly designed project (program or system) with all formal elements (laws, rules and procedures) may not be successfully implemented if some informal rules are not respected.

The question of implementing cost and managerial accounting as public management tools should be considered as one of the most significant public administration reform processes in Republic of Croatia. Currently, main risks for successful reforms are as follows: missing management integrity, inadequate management requests for professional and competent staff, inadequate allocation of responsibilities and authority which results with poor management control, low ethical values, and missing managerial policies. Thus, cost and managerial accounting implementation into public sector has to be seen in the context of the above mentioned and discussed reforming processes. Nevertheless, issues such as political aspect, administrative capacity, organizational capacity – capability for managing changes, cultural inheritance, etc., have to be taken into account as obstacles.

This paper points out the objectives and the purpose of internal reporting through accounting perspective. It also highlights the importance of cost planning and control. Further on it addresses the importance of understanding the existing differences in data that are presented through a variety of reports (external and internal reporting) with the aim of transparency statement on budgetary spending. The authors deem necessary to follow the trends of approaching the same methodological basis for external and internal reporting of accounting and budgetary and statistical purposes, because it would leads to more simple and more transparent statement on budgetary spending.

Also, this paper points out the need for internal financial control system development, especially in the context of the new public management requirements. Areas are presented using cost accounting and emphasized interdependence of cost accounting with financial accounting. In conclusion, we can say that the development of the internal reporting system should be viewed in the context of guidelines provided in IPSASs, greater understanding of the connection between internal and external accounting requirements, and awareness of the need for unified methodological basis in preparing the information for internal and external users.

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PLANIRANJE I KONTROLA TROŠKOVA U HRVATSKOM JAVNOM SEKTORU

SAŽETAK

Kako bi se istražilo do koje se mjere u hrvatskom javnom sektoru koristi upravljačko računovodstvo, 2006. i 2011. je provedena anketa. 2006. je na upitnik odgovorilo ukupno 123 ispitanika dok je 2011. upitnik popunilo 88 jedinica i organizacija iz javnog sektora.

U ovom radu autori prezentiraju empirijske rezultate provedenog istraživanja. Rezultati dokazuju da je upravljanje troškovima u svrhu planiranja i kontrole troškova u hrvatskom javnom sektoru još uvijek nedovoljno razvijeno i nedovoljno korišteno u procesu određivanja proračunske potrošnje. Isto tako, autori daju moguća rješenja za bolje korištenje upravljačkog računovodstva u hrvatskom javnom sektoru.

Ključne riječi: *upravljačko računovodstvo, planiranje, kontrola troškova, javni sektor, Hrvatska*

IMPACT OF COMPANY'S SIZE ON TAKEOVER SUCCESS

DAVOR FILIPOVIĆ[1]

ARTICLE INFO

JEL classification: M19, G34, L25

Keywords:

- Mergers
- Takeovers
- Takeover success
- Company size
- Republic of Croatia

ABSTRACT

Respecting the fact that vast number of M&As do not achieve planed synergies and results and that M&A success is affected by different organizational variables like management, strategy, structure, corporate culture, company size etc., the main aim of this paper is to analyze the impact of company's size on takeover success. Successful takeover is defined as takeover in which target company performs better in the period after the takeover than in the period before the takeover. Hypothesis according to which the smaller the relative ratio of the size of target company compared to the acquirer, the more successful is target company's performance after the takeover was tested and confirmed on the 43 companies that were acquired in the Republic of Croatia.

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I. INTRODUCTION

In turbulent business environment of 21st century companies are forced to use different growth strategies in order to successfully position with respect to competition and to preserve and increase their profit margins. Growth strategy is part of the corporate strategy which emphasizes corporation as a whole and provides answers regarding business scope of the corporation and recourse allocation (Tipurić, 2005). Growth strategies are concerned with increasing the size and viability of the business over time. A successful growth strategy will allow companies to increase its customer base, market segments, geographical scope, and/or product lines, which should lead to revenue growth. Permanent growth enables them to build and sustain their competitive market position (Harrison and St. John, 2008).

Modern business world is cognizant with three ways of implementing growth strategies including: internal or organic growth, growth through mergers and acquisitions, and growth through strategic alliances. Company pursues internal growth by relying on its resources, and also through increase of products and services sold on existing markets, independent development of new products and penetration to new markets (Cingula et al., 2010). Considering the fact that internal growth represents the slowest way to grow and considering that companies cannot accomplish planned growth only by relying on its own resources, companies often expand business through mergers and acquisitions or through strategic alliances (Tipurić and Markulin, 2002).

There is no book, journal or scientific paper in academic literature regarding mergers and acquisitions that does not analyze the impact of M&A's on shareholders wealth and company's performance, motives for M&A's or variables that influence the success of mergers and acquisitions as well as the impact of M&A's on society and economy (DePamphilis, 2008). M&A success can be observed from different perspectives. With the regard to the fact that mergers and acquisitions influence a wide spectrum of stakeholders (e. g. shareholders, managers, employees, clients, suppliers, etc.) and that interests of those stakeholders diverge, M&A transactions can, at the same time, positively influence one part, and negatively influence the other part of stakeholders. Financial theory usually focuses on the shareholders wealth as major criteria for M&A success (Tirole, 2006) but there is no homogeneous opinion in academic community regarding M&A success related to the aim of research (shareholders wealth of company performance) and used methodology.

Respecting the fact that vast number of M&As do not achieve planed synergies and results and that M&A success is affected by different organizational variables like management, strategy, structure, corporate culture, company size etc., the main aim of this paper is to analyze the impact of company size on takeover success. Successful takeover is defined as takeover in which target company performs better in the period after the takeover than in the period before the takeover. Hypothesis according to which the smaller the relative ratio of the size of target company compared to the acquirer, the target company's performance after the takeover is more successful was tested on the 43 companies that were acquired in the Republic of Croatia.

II. LITERATURE REVIEW

Company size is one of the organizational variables whose impact on the success of mergers and acquisitions was studied by numerous scientists. When determining the size of the company in the Republic of Croatia as the criterion for size the value of company's assets, revenue and number of employees is often used. Thus, according to the Croatia's Accounting Law companies are classified as small, medium and large enterprises.

Small enterprises are those that do not exceed two of the following three conditions: the total assets of HRK 32,500,000.00, the revenue of HRK 65,000,000.00, an average number of employees during the financial year 50. Medium-sized enterprises are those which exceed the two previously mentioned conditions but do not exceed two of the following three conditions: the total assets of HRK 130,000,000.00, revenue of HRK 260,000,000.00, the average number of employees during the financial year 250. Large enterprises are those which exceed two of previously mentioned criteria above.

Regardless of the conditions prescribed for large enterprises in terms of the Accounting Law, large enterprises include banks, savings banks, building societies, electronic money institutions, insurance companies, leasing companies, investment fund management and separate assets without legal personality which they manage, management companies of investment funds and property funds with legal personality, management companies mandatory and voluntary pension funds and separate assets under their management, and pension insurance (Narodne novine, 2007).

The results of studies that focus on the impact of company's size on M&A success diverge. Some authors assume that the success of a merger or acquisition is higher if the target and the acquiring company are similar in size (Ahuja, Katila, 2001). In a situation where the acquirer and target company are similar in size or even the same size, it is easier for the acquirer to recognize the value of knowledge and skills obtained by taking over target company and it is easier to assimilate these same skills and apply them within its business system (Choen, Levinthal, 1990). Moreover, it is easier to identify potential redundancies when both companies are of similar size (Krishanan et al., 2007). Other authors believe that the difference in the size is one of the main reasons for the realization of synergies and successful company performance following merger or acquisition. In the situation when the acquirer is smaller than the target-company, by purchasing a target company acquirer increases its market power and the ability to exploit economies of scale and scope (Seth, 1990). Bruton et al. in their research note that there is a higher probability of a successful takeover if the target company is smaller than the acquirer (Bruton et al., 1994). Homberg et al. in the recent study came to the conclusion that it is necessary for the realization of planned synergies, from merger and acquisitions, that the acquirer is bigger than the target company Homberg et al., 2009).

In the survey on the sample of 12,023 M&As in the period from 1980. to 2001. Moeller et al. concluded that the size of acquirers and financial returns in the process of mergers and acquisitions are inversely related. Relatively smaller acquirers often generate higher returns than larger acquirers. Authors explain the research results through the fact that managers in large companies are often overconfident and that they stream to empire building. In addition, authors point out that smaller companies focus and are more prone to takeovers of target companies which have a similar range of products or similar markets (Moeller et al., 2004).

Demsetz and Lehn suggest that the interests of managers in small companies are better aligned with the interests of owners than in the large companies. In that sense, the results of their research show that managers in small companies have a greater shareholding than managers in large companies which can be observed in the context of the size effect on the success of mergers and acquisitions (Demsetz, Lehn, 1985).

Moeller et al. also conducted a survey in 2005. The results indicate that large acquirers do not create value for their shareholders but they ruin it, while smaller acquirers create value for their shareholders (Moeller et al. 2005). According to Frick and Torres the average size of target company has a strong influence on financial returns for acquirer shareholders. In the period from 1990. to 2000. high-tech companies that have exercised an average annual return to shareholders of 39%, acquired target companies with an average size of less than $ 400 million or about 1% of the market value of acquirers (Frick, Torres, 2002). Research of Hackbarth and Morellec showed that large transactions are much riskier for the acquirers. Large transactions typically result in poor company's performance following the merger or acquisition mainly due to problems with integrating a large target company into acquirer's business system (Hackbarth, Morellec, 2008).

In recent research Gorton et al. suggest that smaller acquirers generate higher returns for their shareholders than larger acquirers. Company size in this study is defined relative to other companies within the industry. According to these authors, larger acquirers often overpay the target companies in order to increase its size and to defend themselves in this way from being taken over. Smaller acquirers are more profitable than larger ones because they usually acquire other companies in order to better position themselves in the industry and to become an attractive target for a takeover bid (Gorton et al., 2009).

The larger the target company is the more complex is its organizational structure. After the takeover New management of the target company can find themselves in the situation of losing control over the organization or they are going to need a longer period of time for adjustment because of the complex organizational structure of acquired company (Ravenscraft and Scherer, 1989). Size as a variable that affects the success of mergers and acquisitions is also analyzed when acquiring companies are in financial difficulties. Young startup companies are often in financial difficulties and the assumption is that only a much larger acquirer may provide financial and managerial resources needed for successful business operating (Fluck and Lynch, 1999).

Research by Fuller et al. in 2002. showed that the business success of the company after the takeover is better if the target company is smaller than acquirer (Fuller et al., 2002). Taking into consideration previous research, the impact of company size on the performance of a target company after the takeover will be tested in this paper. The premise on which this research is based is coherent with previous studies that support the thesis that a target company should be smaller than the acquirer in order to achieve better business success of the target company after the takeover.

III. METODOLOGY AND RESEARCH RESULTS

Measuring instrument (questionnaire) for testing the hypotheses of this research consisted of a set of questions that the respondents (board members and company managers) answered and expressed their agreement/disagreement with proposed statements whereat a Likert measurement scale of five degrees was used. Propositions used in different measurement scales are either originally developed for research purposes, or processed and adapted from existing measurement scales that can be found in the relevant scientific literature.

Empirical research was conducted in Croatian companies, which have been taken over or acquired. In Bloomberg and Mergermarket databases 233 transactions in the period 1998. - 2010. were recorded. With the detailed investigation of the information library of the Croatian Agency for Supervision of Financial Services another 401 transaction during this period was recorded, which combined with the transactions from Bloomberg and Mergermarket databases comes to a total of 634 transactions. Since this paper analyses transactions in non-financial sector, the sample on which the empirical research was conducted comprised of 598 companies. In order to analyze the impact of the company size on takeover success, it was important that at least three years have passed since the takeover. For this reason, the acquired companies were analyzed in the period from 1998. – 2006 (Filipović, 2011).

In the period of sixty days after the beginning of the primary research 43 completed questionnaires were returned representing a return rate of 7.19%. Considering the sensitivity of the analyzed phenomena and complexity of analysis, the rate of return of questionnaires was acceptable. The complexity of the analysis is reflected in the fact that the study included only companies in which at last three years passed after the takeover. Additional criteria were related to the fact that the respondent (the president or board member or senior manager) should be included in the acquisition process and familiar with the acquisition activities, and also working in the company that was acquired at least 5 years in order to identify and assess the changes that have occurred after acquisition. Out of the total number of received questionnaires, 30 companies that performed better after the takeover were identified (69.8%) and 13 that performed worse after the transaction (30.2%).

In the analysis of empirical data collected in this study large number of statistical techniques was used. Overall data analysis was conducted using statistical software package SPSS 17.0. Empirical research begins by testing the hypothesis:

The smaller the relative size ratio of the target company compared to the acquirer, the more successful is target company's performance after the takeover.

In order to test the proposed hypothesis research participants were asked about the size of acquired company (size was measured by total revenues, total assets and number of employees) at the time of acquisition compared to the size of the acquirer (measured by total revenues, total assets and number of employees). Results of descriptive statistics are presented in Table 1.

TABLE 1— Analysis of the relative size ratio of the target company and the acquirer

Size of the target compared to the acquirer		Performance after the takeover		Total
		Worse	*Better*	
Very small (< 25%)	Number of companies	4	16	20
	%	20,0%	80,0%	100,0%
Small (26% - 49%)	Number of companies	4	10	14
	%	28,6%	71,4%	100,0%
Large (50% - 67%)	Number of companies	0	2	2
	%	,0%	100,0%	100,0%
Very large (68% - 99%)	Number of companies	0	1	1
	%	,0%	100,0%	100,0%
Equal (100%)	Number of companies	5	0	5
	%	100,0%	,0%	100,0%
Total	Number of companies	13	29	42
	%	31,0%	69,0%	100,0%

SOURCE: Author's research

Among the analyzed companies, 20 of them were very small, and 14 of them were small in relation to the acquirer. Only 5 of the analyzed companies were the same size as the acquirer while two acquired companies were larger than acquirer. One acquired company was very large compared to the acquirer. In order to determine the statistical correlation between the relative size of the target company and the acquirer with the successful target company's performance after the takeover a Chi-square test with the symmetric measures was used.

TABLE 2— Chi-square test

Chi-Square Test	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	13,658	4	,008	,004
Likelihood Ratio	15,205	4	,004	,004
Fisher's Exact Test	11,758			,006

SOURCE: Author's research

TABLE 3— Chi-square symmetric measures

Symmetric Measures	Value	Approx. Sig.	Exact Sig.
Phi	,570	,008	,004
Cramer's V	,570	,008	,004
Contingency Coefficient	,495	,008	,004

SOURCE: Author's research

Results of Chi-square test and the corresponding symmetric measures show that there is a statistically significant correlation between the relative size of the target company compared to the acquirer and target company's performance after the takeover (p = 0.008).

Within the testing of hypothesis research participants, whose companies were very small or small, compared to acquirer, were asked to assess the impact of the size of the acquirers on the target company's performance after the acquisition.[2] Results of descriptive statistics are presented in Table 4.

TABLE 4 — Analysis of the acquirer's size impact on the target company's performance after takeover

Target company's performance after takeover	N	Mean	Std. Deviation	Std. Error Mean
Worse	8	2,50	,535	,189
Better	26	3,21	1,031	,195

SOURCE: Author's research

For the research participants from the companies that were small or very small compared to the acquirer, which had better company performance after the takeover, the average impact of the size effect on the target company's performance was moderate (3.21). Participants from companies that had worse performance after the takeover stressed that the average impact of the size effect on the target company's performance was weak (2.50). In order to examine whether there is a statistically significant difference between the mean scores of the participants opinions the T-test was used.

TABLE 5 — Levene's Test for Equality of Variances

	Levene's Test for Equality of Variances		T-test for Equality of Means		
	F	Sig.	t	df	Sig. (2-tailed)
Equal variances assumed	1,783	,191	-1,875E+00	34	,069
Equal variances not assumed			-2,631E+00	23,048	,015

SOURCE: Author's research

It is evident from Table 5 that the results of T-tests show statistically significant difference (p = 0.0345 for one-tailed test) between the mean scores of research participants whose companies operated worse and better after the takeover about the impact of the size of the acquirer on their companies performance after the takeover.

Taking into account that the Chi-square test proved that there is a statistically significant correlation between the size of the target company compared to the acquirer and the performance of the target company after the takeover (p = 0.008) and considering the fact that of the total number of analyzed companies which had better performance after the takeover,

[2] The impact was assessed using Likert's scale: 1 – no impact, 2 – weak impact, 3 – moderate impact, 4 – strong impact, 5 – very strong impact).

89,66% of them were small or very small compared to the acquirer, **hypothesis according to which the smaller the relative size ratio of the target company compared to the acquirer, the more successful is target company performance after the takeover can be accepted.**

IV. CONCLUDING REMARKS

Mergers and acquisitions represent an inherent part of growth strategy that enables companies to strengthen their market position much faster than is possible when they decide to grow internally. Growth of the company trough M&A provides access to new markets and resources, and success or failure of M&A is of great importance not only for companies included that in that process, but also for all participants of that process, and for the whole economy. Respecting the fact that vast number of M&As do not achieve planed synergies and results and that M&A success is affected by different organizational variables this paper analyzed the impact of company size on takeover success. Therefore, empirical research was conducted among Croatian companies that were acquired or taken over and a hypothesis according to which the smaller the relative size ratio of the target company compared to the acquirer, the more successful is target company performance after the takeover was tested and accepted. Results of Chi-square test and the corresponding symmetric measures showed that there is a statistically significant correlation between the relative size of the target company compared to the acquirer and target company's performance after the takeover ($p = 0.008$). Additionally, the results of T-test showed statistically significant difference ($p = 0.0345$ for one-tailed test) between the mean scores of research participants whose companies operated worse and better after the takeover about the impact of the relative size of the target company compared to the acquirer on their companies' performance after the takeover.

Considering the results of the conducted empirical research and results of the previous studies about the company size impact on successful takeover it can be concluded that it is important for the success of the takeover that the target company is smaller than the acquirer. Finally, the results of this research can contribute to the increase of the number of successful takeover not only in Republic of Croatia, but also in other counties with active M&A arena.

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UTJECAJ VELIČINE PODUZEĆA NA USPJEH PREUZIMANJA

SAŽETAK

Respektirajući činjenicu kako brojna spajanja i preuzimanja nisu ostvarila planirane sinergije i rezultate te uzimajući u obzir da na uspjeh preuzimanja utječu brojne organizacijske varijable poput menadžmenta, strategije, strukture, korporativne kulture, veličine poduzeća i dr., glavni cilj ovoga rada je analizirati utjecaj veličine poduzeća na uspjeh preuzimanja. Uspješno preuzimanje je definirano kao preuzimanje u kojem poduzeće-meta u razdoblju nakon preuzimanja posluje uspješnije nego što je poslovalo u razdoblju prije preuzimanja. Na uzorku od 43 preuzeta poduzeća u okviru empirijskog istraživanja testirana je i dokazana hipoteza koja glasi: što je manji relativni odnos veličine preuzetog poduzeća, u odnosu na preuzimatelja, to je uspješnost poslovanja preuzetog poduzeća bolja.

Ključne riječi: *spajanja, preuzimanja, uspjeh preuzimanja, veličina poduzeća, Republika Hrvatska.*

PERFORMANCE MEASUREMENT SYSTEMS: EMPIRICAL EVIDENCE FROM SLOVENIA

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ABSTRACT

The present study aims to analyze the use of performance measurement systems within Slovene large, medium-sized, and small companies. The study was performed on the basis of a questionnaire which was distributed to the management of Slovene firms in 2007, analyzing the use of performance measurement techniques in the post-transition period. Slovene companies mainly use traditional performance measurement techniques. Contemporary performance measurement systems were used only occasionally. Moreover, the study demonstrates that performance measurement techniques differ between companies of different size. Small companies have less developed performance measurement systems that are based almost solely on traditional measurement techniques, while large companies have more developed performance measurement systems and also use some more contemporary techniques. Future research should analyze the design of management accounting systems in economies that have completed the transition period to provide evidence about the changes that occur afterwards.

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I. INTRODUCTION

In spite of the fact that many of the basic accounting principles were developed in 1920s, they remained largely unchanged until 1980s (Neely, 2005). The weaknesses of traditional accounting measures that were addressed in the late 1970s and 1980s resulted in the development of numerous performance measurement systems. This phenomenon was particularly present in the late 1980s and in the 1990s. The development of performance measurement systems can be divided into three main phases (Bourne et al., 2000, 757): a) the design of performance measures, b) the implementation of performance measures, and c) the use of performance measures. While the design and the implementation phases have been the subject of much research, the third phase has not been a subject of wider interest. The present study aims to make a contribution to the existing findings regarding the use of performance measurement systems in practice from the framework of a transition economy. The majority of studies deal with developed market economies, while just few of them were engaged in economies that are in the transition process, or have barely completed it (Haldma and Lääts, 2002) and the situation to date has not changed significantly (Hopper et al., 2009).

The views about the contribution of performance measurement systems to organizational performance are not uniform among researchers. Some of them demonstrated that businesses performed better if they used integrated performance measures, while others argue that the use of performance measurement systems, such as balanced scorecard does not make any difference to business performance (Bititci et al., 2006). More contemporary studies suggest that the impact of performance measurement systems is contingent (Braam and Nijssen, 2004). Deriving from the contingency theory, the benefits of performance measurement systems depend on the way they are used. Thus, we believe that an appropriate performance measurement system as an integral part of a management accounting system is also crucial in Slovenia.

The remainder of this paper is organized as follows. Section Two is a brief overview of the literature on performance measurement systems in which traditional and contemporary techniques for decision making are presented. The third part explains the data used for the analysis and the methodology. The results of the analysis follow in the fourth part. Finally, the paper ends with concluding remarks.

II. THEORETICAL BACKGROUND AND HYPOTHESIS FORMULATION

The literature review reveals that much of the early research in the field of performance measurement in management accounting was concerned with either the use of performance measures or the use of standard costing and variance analysis (Chenhall and Langfield-Smith, 2007). It is argued that performance measurement has an important role in efficient and effective management of organizations. Already Emmanuel, Otley and Merchant (1990) noted that performance evaluation was an important function of management accounting.
Despite the fact that substantial efforts were made to what should be measured today, no uniform comprehensive measurement system that could be adopted universally has yet been formulated. Studies have shown (Chenhall and Langfield-Smith, 1998; Joshi, 2001) that the

most widely used among performance measures were at first financially-oriented techniques, and only later non-financial measures became notable more important. McKinnon and Bruns (1992) found that among almost 100 financial and non-financial measures they were exploring in US companies, profit and income were the most widely used measures to evaluate company performance. Among the ratios, the most commonly examined is the return on equity (ROE), followed by the return on assets (ROA) and the leverage (ROE components in the DuPont formula) (Lapointe-Antunes, Cormier and Magnan, 2010, 41). DuPont has been widely acknowledged to be the founder of the financial ratios measurement system (Anderson and McAdam, 2004). From early 1900, when the system was presented for the first time, until 1980s it was the most widely used performance measurement system to benchmark organizational performance. Due to the fact that profit as a simple accounting measure relies on past results and, moreover, can be subject to earnings management, traditional accounting measures were supplemented by non-financial categories, with an emphasis on future performance instead of past results.

By the early 1980s there was a growing realization that financial profit measures failed to reflect changes in the competitive circumstances and strategies of modern organizations (Kennerley and Neely, 2002, 1223). In recent decades we have seen numerous attempts to create more dynamic models for measuring business results, but scant interest has been shown by those involved in the practice of management accounting. The most notable innovation in this field was undoubtedly the balanced scorecard (BSC) developed by Kaplan and Norton (1992). Many other attempts were made to evaluate performance measurement systems. Among those attempts were the performance measurement matrix by Keegan, Eiler and Jones in 1989, the performance pyramid proposed by Lynch and Cross (1991), the results and determinants framework which emerged in 1991 (Fitzgerald et al., 1991), and the performance prism in 2001 (Neely, Adams and Crowe, 2001). Different models address different issues. None of these frameworks (apart from the BSC) was widely accepted in practice. In the 2000s a lot of research emphasizes the need to re-evaluate the existing performance measurement systems (Bourne et al., 2000; Bititci, Turner and Begemann, 2000). Bitici, Turner and Begemann (2000) criticism mostly refers to the dynamicity of the systems. They believe that modern systems should be sensitive to changes in the internal and external environments. Changes in the environment should lead to reviewed internal objectives and, finally, the revised objectives should be reallocated to the critical parts of the system.

Research from less developed countries and transition economies (Haldma and Lääts, 2002; Hopper et al., 2009) have demonstrated that management accounting systems are still not highly developed and comparable with developed market economies, and they are still in the initial stages of development. Joshi (2001) found out that in the case of India the adoption rate of traditional accounting practices was higher than (for that time) recently developed techniques. Moreover, he found that in the case of India most of the practices adopted relate to traditional budgeting and performance evaluation system. The predominant use of traditional management accounting techniques was also found by Sulaiman, Ahmad and Alwi (2004) in the case of Malaysia, Singapore, China, and India.

Since our study explores the use of performance measurement systems and refers to a period when Slovenia was in the post transition process (for details see Stubelj and Dolenc, 2010), we formulate our first hypothesis as follows: Slovene companies mostly use traditional performance measurement techniques. Traditional management accounting techniques were more financially-oriented, focusing on variance analysis and profit-based performance

measures (Chenhall and Langfield-Smith, 1998, 1), while modern management accounting techniques focus more on non-financial measures (for more details see Ivankovič, Janković and Peršić, 2010), using contemporary performance measurement systems and benchmarking techniques.

Performance measurement systems proposed by academics and practitioners were developed for large companies. Small and large companies are fundamentally different from each other in three central aspects: uncertainty, innovation, and evolution (Garengo, Biazzo and Bititci, 2005, 26). Differences between performance measurement systems in large and small companies were rarely addressed. Garengo, Biazzo and Bititci (2005, 28-29) found five common characteristics of performance measurement systems in small and medium-sized companies (SMEs): a) Difficulties in involving SMEs in performance measurement projects, b) SMEs either do not use any performance measurement model or they use models incorrectly, c) Performance measurement systems implemented in SMEs rarely have a "holistic approach," d) SMEs' approach to performance measurement is informal, not planned and not based on a predefined model, and e) SMEs have limited resources for data analysis.

Performance measurement systems should help small and medium-sized entities manage uncertainty, innovate their products and services, and sustain evolution and change processes (Garengo, Biazzo and Bititci, 2005, 26). Performance measurement systems developed in theory don't seem to apply to small companies (Cocca and Alberti, 2010). Moreover, Hudson, Smart and Bourne (2001) found that small companies had difficulties in implementing a strategic performance measurement system. Researchers suggest (Hudson, Smart and Bourne, 2001; Garengo, Biazzo and Bititci, 2005) that the primary reasons are lack of human resources and managerial expertise. In relation to different characteristics of companies, depending on their size, we believe that: performance measurement practices differ in relation to the size of the company.

III. RESEARCH SAMPLE AND METHODOLOGY

Our analysis is performed on the basis of a questionnaire that was distributed to large, medium, and small-sized Slovene companies at the beginning of 2007. 167 questionnaires were correctly completed. The questionnaire (close-ended questions) was formulated on the basis of the Slovene Accounting Standards (SAS). The majority of companies that were asked to complete the questionnaire were reporting in accordance with the SAS, and only a minority had introduced the International Financial Reporting Standards (IFRS) which have become obligatory for consolidated accounts of publicly traded companies since 2005. Thus, we based our questionnaire on the rules concerning professional conduct in the field of accounting as defined by the SAS. Due to the fact that none of the SAS define rules concerning professional conduct in the field of management accounting, we based the questionnaire on SAS No. 29 - Accounting analysis, focused on the overall operation analysis of the entity. In general, SAS 29 defines two main methods of analysis: a) analysis of variances (no detailed rules are provided), and b) financial ratios analysis. We focused on leverage ratios, liquidity ratios, and turnover ratios. SAS 29 as leverage ratios includes: equity financing rate, debt financing rate, long-term financing rate, short-term financing rate, share capital rate, debt to equity ratio, and rate of accrued and deferred items. Liquidity ratios are cash (acid test) ratio, quick ratio, and current

ratio, while turnover ratios are current assets turnover ratio, fixed assets turnover ratio, and materials inventory/products/merchandise inventory/trade receivables turnover ratio.
The financial aspect is measured on the basis of profitability measures, while the economic indicators focus on how the economic status of stakeholders changes over time (as a consequence of organizational activities).

In order to test the first hypothesis, we analyzed performance measurement techniques used by Slovene companies to evaluate business performance. The second hypothesis was tested with chi-square tests, where differences between companies of different sizes were ascertained.

IV. DATA ANALYSIS AND RESULTS

The sample consists of 167 companies, of which 36.5% are large companies, 33.5% medium, and 30% small-sized companies.[4] 57.5% are operating in services industry, while 42.5% are manufacturing companies. In 2006, 148 companies (88.6%) recorded a positive return on equity, while 19 (11.4%) recorded losses. Characteristics of accounting departments and the education of accountants in companies that were included in the analysis are presented in Table 1.

TABLE 1 — Characteristics of accounting departments and education of accountants

Company Size			Accounting		Department			Education		
	n	%	I	E	A	N	S	C	H	M
Large	61	36.5%	61	/	58	3	7	12	37	5
Medium-sized	56	33.5%	55	1	54	1	7	13	33	3
Small	50	30 %	38	12	34	4	13	13	24	0
Total	167	100 %	154	13	146	8	27	38	94	8

SOURCE: Own data
Notes: I – internal accounting service, E – external accounting service, A – the company has a separate accounting department, N – the company has no separate accounting department, S – secondary school, C – vocational college, H – higher education program and M – master degree

To understand more in-depth the organization of accounting departments in Slovene companies and the use of performance measurement systems in practice, the most important general characteristics of accounting departments are presented. In the presented sample 91% of the companies had its own accounting department, while 8% used an external accounting service. Among those that do not have their own accounting department (13 companies) twelve

[4] In accordance with the Slovene Companies Act from the year 2006 companies are classified as micro, small, medium-sized, and large companies on the basis of the following criteria at the balancing date of the annual balance sheet (on the basis of the data for two consecutive business years): the average number of employees in a financial year, net sales income; and the value of assets. Micro companies are those that have less than 10 employees, net sales income less than 2 million €, value of assets less than 2 million €. Small companies are those that have less than 50 employees, net sales income less than 8,800,000 million €, value of assets less than 4,400,000 million €. Medium-sized companies are those that have less than 250 employees, net sales income less than 35,000,000 million €, value of assets less than 17,500,000 million €. Companies that do not comply with the criteria for micro, small, or medium-sized companies are large companies. For more detailed criteria see: http://www.mg.gov.si/fileadmin/mg.gov.si/pageuploads/predpisi/ZGD-1_prevod_AN.pdf.

companies are small, and one is a medium-sized company. The results are consistent with those expected. Practically, only small companies had external accounting services. Among companies that have their own accounting service, the majority has a separate accounting department within the company. In only 8 or 5.2% of the cases (out of 154) accounting services are held within other departments. Most of chief accounting officers finished a higher education program (94 or 56.3%), followed by those that finished a vocational college (38 or 22.8%), secondary school education (27 or 16.2%), and only 8 (or 4.7%) have a master degree. However, chi-square test suggests that the education of the chief accounting officer does not differ among the companies of different size (χ^2-value of 9.574; p = 0.144). Moreover, most of the chief accounting officers are not certified by the Institute of Auditors (not presented in Table 1). In the case of large companies this share amounts to 73.8% (or 45 companies), in medium-sized companies to 73.2% (or 41 companies), and in small companies to 66% (33 companies). The results of the chi-square test do not indicate any significant difference between the companies of different sizes (χ^2-value of 7.446; p = 0.489).

In accordance with the literature, information for decision makers (including those that concerns performance measurement) is provided by the management accounting system. Thus, we first analyzed the importance of accounting departments as the primary source of decision-making information. Companies were asked which department or group of employees provided the information for decision making (Table 2).

TABLE 2 — Departments and group of employees providing information for decision-makers

Departments and group of employees	Large	Medium-sized	Small	Total (% of total)
Accounting	18	27	30	75 (45%)
Analysts	5	2	2	10 (6%)
Operational staff	1	5	4	10 (6%)
Accounting and some other departments	30	20	10	60 (36%)
Other	7	2	3	12 (7%)
Total (% of total)	61 (36.5%)	56 (34%)	49* (29.5%)	167 (100%)
Chi-square test**	X^2-value of 12.531; $p = 0.002$			

SOURCE: Own data

Notes*: 1 small company did not provide any answer

Notes**: For the purpose of the chi-square test, only the accounting department and the combination between accounting department and other departments were included (cell categories with an expected count below 5 were excluded).

The results show that the accounting department is on average the most important department providing information for decision makers in Slovene companies (45% of cases). It is followed by the combination of accounting department and other departments (36% of cases). In the case of large companies, the most important provider of information is the combination of accounting department and other departments (30 companies out of 61, i.e. 49%), while in middle-sized and small companies the most important is the accounting department per se, followed by the combination of accounting and other departments. The chi-square test suggests that the importance of departments differs between companies in relation to their size ($p < 0.05$). Operations of large companies are more complex and the same is true of information for decision makers. Thus, it is not surprising that in large companies decision-makers most commonly receive information provided by the combination of the accounting and other departments (combination of different knowledge).

To ascertain if the performance measurement practice differs in relation to the companies' size, the respondents were first asked how the companies' performance was evaluated (Table 3).

TABLE 3 — Performance measurement practices among Slovene companies

Performance measurement practices	Large	Medium-sized	Small	Total (% of total)
Financial ratios	12	11	6	29 (17.5%)
Comparison with the previous year's results and the plan	20	21	32	73 (44%)
Financial ratios, comparison with the previous year's results and the plan	12	10	2	24 (14.5%)
Financial ratios, comparison with the previous year's results and the plan, and calculation of variances	11	9	6	26 (16%)
Other techniques	6	3*	4	13 (8%)
Total (% of total)	61 (37%)	54 (33%)	50 (30%)	165 (100%)
Chi-square test**	X^2-value of 14.032; $p = 0.029$			

SOURCE: Own data

Notes*: 2 middle-sized companies did not provide an answer

Notes**: 3 cells had an expected count less than 5; therefore other techniques were excluded from the chi-square test.

On average, the most common technique used is the comparison with the previous year's results and the plan (73 companies out of 165, i.e. 44%), followed by financial ratios analysis (17.5%) and combinations between financial ratios analysis and comparison with the previous year's results, the plan and variances analysis (16%). Only 14.5% of the respondents use financial ratios, comparison with the previous year's results and comparison with the plan, and 8% of respondents use other techniques. The latter are very rarely used. The chi-square tests suggest that the performance measurement system differs between companies of different size ($p < 0.05$). Small companies do not use financial ratios in the same extent as

larger companies. They rather use the comparison with previous year results and comparison with the plan. In the case of small companies, even the combination between financial ratios and other techniques is relatively low (14 companies out of 50, i.e. 28%).

To understand to what extent the use of financial ratios differs among Slovene companies, we analyzed their use in relation to their content. We based our analysis on a part of ratios defined in the Slovene accounting standards. Different groups of financial ratios were assessed separately. The results are as follows (table 4).

TABLE 4 — The use of leverage ratios

The use of leverage ratios	Large	Medium-sized	Small	Total (% of total)
Use of all ratios defined by the SAS	46	37	35	118 (73%)
Use of all ratios defined by the SAS except some of them	6	8	4	18 (11%)
None of these ratios is used	5	9	11	25 (16%)
Total (% of total)*	57 (35.5%)	54 (33.5%)	50 (31%)	161 (100%)
Chi-square test	X^2-value of 4.850; $p = 0.303$			

SOURCE: Own data

Notes*: 6 companies use other techniques

Contrary to our expectations, chi-square test did not ascertain any statistical difference between groups of companies. Surprisingly, 35 small companies out of 50 (70%) use all leverage ratios defined by the SAS. Discrepancies with the results in Table 3 may only refer to a limited use of ratios, primarily the one defining the leverage, neglecting nearly all the others. The majority of the companies in the sample use all leverage ratios defined by the SAS (118 companies or 73%). Only a small part of the companies state that none of the ratios defined by the SAS is used (25 companies or 16%).

Just the opposite is the picture in the case of liquidity ratios (table 5). Chi-square test suggests that the use of liquidity ratios differs between companies of different size ($p < 0.05$).

TABLE 5 — The use of liquidity ratios

The use of liquidity ratios	Large	Medium-sized	Small	Total (% of total)
Use of all ratios defined by the SAS	40	22	12	74 (50%)
Use of all ratios defined by the SAS except some of them	8	6	2	16 (11%)
None of these ratios is used	8	21	29	58 (39%)
Total (% of total)*	56 (38%)	49 (33%)	43 (29%)	148 (100%)
Chi-square test	X^2-value of 29.612; $p = 0.000$			

SOURCE: Own data

Notes*: 3 companies use other techniques, 16 companies did not provide any answer.

The majority of large companies use all ratios defined by the SAS, while a large extent of medium-sized and small companies (21 medium-sized and 29 small companies; i.e. 43% and 67%, respectively) do not use any of the ratios defined by the SAS. The results for small companies are in line with those resulting from table 3, where a notable part of small companies seems not to use financial ratios analysis at all. Despite the fact that the majority of small and medium-sized do not use any of the ratios defined by the SAS we believe that companies monitor liquidity in other ways (for instance, see Kavčič, Koželj and Odar, 2010). We believe that medium-sized and small companies do not use the liquidity ratios analysis based on financial ratios defined by the SAS, but they evaluate specific information for decision-makers based primarily upon the needs of the company. In the case of turnover ratios the picture is very similar (Table 6).

TABLE 6 — The use of turnover ratios

The use of turnover ratios	Large companies	Medium-sized	Small	Total (% of total)
Use of all ratios defined by the SAS	44	27	15	86 (60%)
Use of all ratios defined by the SAS except some of them	4	2	1	7 (5%)
None of these ratios is used	7	17	27	51 (35%)
Total (% of total)*	55 (38%)	46 (32%)	43 (30%)	144 (100%)
Chi-square test**	X^2-value of 25.251; $p = 0.000$			

SOURCE: Own data

Notes*: 5 companies use other techniques, 18 companies did not provide any answer.

Notes**: 3 cells have expected count less than 5, thus the second category of answers (use of all ratios defined by SAS except some of them) was excluded from the chi-square test.

The difference between groups of companies is significant. The analysis of results shows that the turnover ratios defined by the SAS are primarily used by large companies, while they are only used in 59% of medium-sized companies and in 35% of small companies. The absence of turnover ratios is most notable in small companies as we could speculate on the basis of the results we obtained in Table 3. Interestingly, almost none of the companies uses other techniques that are not defined by the SAS (only 5 companies).

Additionally, we were interested to see to what extent are the financial ratios important for other departments within a company. Table 7 demonstrates that (as expected) large companies pay more attention to financial ratios, as they are also integrated in other departments of the company (58 out of 61 large companies). On the other hand, this is not the case in small companies – only 37% of cases (18 out of 49 respondents). In this context, medium-sized companies are more similar to large companies than to small companies. In 44 of medium-sized companies (80% of all medium-sized companies) financial ratios are also used by other departments of the company.

TABLE 7 — Are financial ratios also used by other departments of the company?

Use of financial ratios by other departments	Large	Medium-sized	Small	Total (% of total)
They are used	58	44	31	133 (81%)
They are not used	3	11	18	32 (19%)
Total (% of total)*	61 (37%)	55 (33%)	49 (30%)	165 (100%)
Chi-square test	X^2-value of 17.615; $p = 0.000$			

SOURCE: Own data

Notes*: 2 companies did not provide an answer.

The use of financial ratios for performance analysis evaluation demonstrates that companies differ in this respect too (Table 8). Small companies often make comparative analysis only with previous results and/or with competitors and/or with the branch average (27 out of 47 companies, i.e. 57%), while large companies more often also rely on the comparison with the planned results (35 out of 61 companies, i.e. 57%). Medium-sized companies are in this particular case more similar to small compnies.

TABLE 8 — How is performance analysis evaluated in terms of financial ratios?

Performance analysis evaluation	Large	Medium-sized	Small	Total (% of total)
Comparative analysis with the previous year's results and/or comparison with competitors and/or comparison with the branch average	21	26	27	74 (45%)
Comparative analysis with the planned results **	5	2	0	7 (4%)
Comparative analysis with the previous year's results and the planned results and/ or comparison with competitors and/or comparison with the branch average	35	20	11	66 (41%)
No answer**		0 8 9 16 (10%)		
Total (% of total)*	61 (37%)	56 (34%)	47 (29%)	164 (100%)
Chi-square test		X^2-value of 0.597; $p = 0.005$		

SOURCE: Own data

Notes*: 3 companies use other techniques.

Notes**: comparative analysis with the planned results and the missing answers were excluded from the chi-square test.

However, the majority of the companies are satisfied with the financial ratios defined by SAS (Table 9). Differences between companies with regard to their size are not significant. The highest share of respondents who think that additional ratios are needed is found among large companies (15 companies or 25% of all large companies). It might seem obvious, as more complex business activities require more sophisticated measurement systems, while small companies are probably satisfied with the extent of ratios included in the SAS, as they often do not calculate many ratios to evaluate performance (deducible from Tables 5 and 6).

TABLE 9 — Usefulness of financial ratios defined by the SAS

Usefulness of SAS ratios	Large	Medium-sized	Small	Total (% of total)
Satisfies the needs	45	49	42	136 (84%)
Additional ratios are needed	15	6	5	26 (16%)
Total (% of total)*	60 (37%)	55 (34%)	47 (29%)	162 (100%)
Chi-square test		X^2-value of 5.668; $p = 0.059$		

SOURCE: Own data

Notes*: 5 companies did not provide an answer.

As expected (Table 10), small companies practically never use balanced scorecard systems (only 5 out of 48 companies use them, i.e. 10%). Large companies, however, use them more often (24 companies out of 59, i.e. 40%). Medium-sized companies, similar to small companies in large part do not use them (43 companies or 80%). Chi-square test affirms our expectations; there is a statistically significant difference between the groups of companies ($p < 0.05$).

TABLE 10 — The use of balanced scorecard system

Balanced scorecard use	Large	Medium-sized	Small	Total (% of total)
In use	24	11	5	40 (25%)
Not in use	35	43	43	121 (75%)
Total (% of total)*	59 (36.5%)	54 (33.5%)	48 (30%)	161 (100%)
Chi-square test	X^2-value of 13.852; $p = 0.001$			

SOURCE: Own data

Notes*: 6 companies did not provide an answer.

Subsequently, we explored which measures are used to evaluate economic performance. Economic performance measures take into account not only the cost of debt but also the cost of capital as traditional accounting measures. The most commonly used measures are following: economic value added (EVA), present value techniques and market value added (MVA). In accordance with the fact that only a small part of large companies is publicly quoted, we formulated our question by including traditional accounting measures and the use of EVA. The results (Table 11) suggest that only large companies use modern economic measures of performance (34 companies out of 60; i.e. 57%). Medium-sized companies use them in 22% of cases (12 companies), while small companies in 33% (15 companies). The difference between companies of different size is significant ($p < 0.05$).

TABLE 11 — Economic performance evaluation

Economic performance evaluation	Large	Medium-sized	Small	Total (% of total)
ROE and/or ROA	24	38	29	91 (57%)
EVA-Economic value added And ROE and/or ROA	34	12	15	61 (38.5%)
Other**	2	4	1	7 (4.5%)
Total (% of total)*				60 (38%) 54 (34%) 45 (28%) 159 (100%)
Chi-square test	X^2-value of 14.336; $p = 0.001$			

SOURCE: Own data
Notes*: 8 companies did not provide any answer.
Notes**: Other measures were excluded from the chi-square test.

Finally, we were interested to know if any difference can be ascertained by analyzing the performance measurement systems in companies that have their own accounting departments and those that use an external accounting service. We compared all the responses between small companies with internal and external accounting services (the results are presented in appendix). The chi-square test for all the responses suggests that differences between these two groups of companies cannot be found ($p > 0.05$). In the case of small companies the external accounting service seems to provide as good information as the internal accounting department.

V. CONCLUSIONS

Studies have shown that transition and less developed economies have management accounting systems that are less developed than those in traditional market economies (Haldma and Lääts, 2002; Hopper et al., 2009). Focusing on the field of performance measurement, our results suggest that even in the post-transition case of Slovenia, companies rarely use contemporary performance measurement techniques, thus we can accept our first hypothesis. Only a small part of the respondents use balanced scorecard techniques and performance measures apart from those based on traditional accounting measures.

Despite the fact that evolutionary paths of performance measurement were associated with the transition from operations to strategic orientation measures (Chenhall and Langfield-Smith, 1998; Srimai et al., 2011), emphasizing the importance of non-financial measure, the latter were not commonly used in Slovene while over passing the transition process.

A further analysis reveals that performance measurement systems differ between companies of different sizes, confirming previous findings of Garengo, Biazzo and Bititci (2005) and

suggesting the need for a performance measurement system specific for small and medium-sized companies proposed by Cocca and Alberti (2010). The results of our analysis confirm that the most holistic system of measurement is present in large companies, while less developed systems are used in small companies. Middle-sized companies seem to have more developed measurement systems than small companies, but less developed ones than large companies. Small and medium sized entities usually do not implement integrated performance measurement systems.

Even though the use of financial ratios is almost a business analysis paradigm, small companies do not implement them as we would expect. They seem to prefer simpler techniques, even at the cost of accuracy. We presume that accounting departments in small companies are often engaged only in bookkeeping activities, while further analysis is often missing. Small companies mostly use only leverage ratios, while liquidity ratios and turnover ratios are not that important from their point of view. Small companies should measure their economic performance on some more developed techniques that are not based only on accounting measures (which do not incorporate the equity cost of capital). That is why, further research should engage also in performance measurement frameworks development, since to date no major efforts were made in the field.

Due to a rather small sample of small companies, the results might not reflect the use of financial ratios within the population. We did not include all ratios defined by the SAS, but only the most common ones. The inclusion of additional ratios could lead to different results. Thus, the results we obtained have to be used with prudence. We suppose that the respondents have appropriate knowledge about the content of financial ratios defined by the SAS, and thus were able to provide a fair view of companies' activities.

Future research should analyze further developments of accounting practices in economies that completed the transition process in order to find out to what extent more contemporarily management accounting techniques have been used after the transition.

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APPENDIX

THE USE OF LEVERAGE RATIOS

The use of leverage ratios	Internal accounting service	External accounting service	Total (% of total)
Use of all ratios defined by the SAS	27	8	35 (70%)
Use of all ratios defined by the SAS except some of them	2	2	4 (8%)
None of these ratios is used	8	3	11 (22%)
Total (% of total)	37 (74%)	13 (26%)	50 (100%)
Chi-square test	X^2-value of 1.386; p = 0.500		

SOURCE: Own data

THE USE OF LIQUIDITY RATIOS

The use of liquidity ratios	Internal accounting service	External accounting service	Total (% of total)
Use of all ratios defined by the SAS	8	4	12 (27.9%)
Use of all ratios defined by the SAS except some of them	2	0	2 (4.7%)
None of these ratios is used	22	7	29 (67.4%)
Total (% of total)*	32 (74.4%)	11 (25.6%)	43 (100%)
Chi-square test	X^2-value of 1.098; $p = 0.578$		

SOURCE: Own data

Notes*: 7 companies did not provide any answer.

THE USE OF TURNOVER RATIOS

The use of turnover ratios	Internal accounting service	External accounting service	Total (% of total)
Use of all ratios defined by the SAS	12	3	15 (35.7%)
None of these ratios is used	18	9	27 (64.3%)
Total (% of total)*	30 (71.4%)	12 (28.6%)	42 (100%)
Chi-square test	X^2-value of 0.840; $p = 0.359$		

SOURCE: Own data

Notes*: 1 company uses other techniques, 7 companies did not provide any answer.

ARE FINANCIAL RATIOS ALSO USED BY OTHER DEPARTMENTS OF THE COMPANY?

Use of financial ratios by other departments	Internal accounting service	External accounting service	Total (% of total)
They are used	24	7	31 (63.3%)
They are not used	13	5	18 (36.7%)
Total (% of total)*	37 (75.5%)	12 (24.5%)	49 (100%)
Chi-square test	X^2-value of 0.166; $p = 0.683$		

SOURCE: Own data

Notes*: 1 company did not provide any answer.

HOW IS PERFORMANCE ANALYSIS EVALUATED IN TERMS OF FINANCIAL RATIOS?

Performance analysis evaluation	Internal accounting service	External accounting service	Total (% of total)
Comparative analysis with the previous year's results and/or comparison with competitors and/or comparison with the branch average	20	7	27 (71.1%)
Comparative analysis with the previous year's results and the planned results and/or comparison with competitors and/or comparison with the branch average*	10	1	11 (28.9%)
Total (% of total)**	30 (78.9%)	8 (21.1%)	38 (100%)
Chi-square test	X^2-value of 1.333; $p = 0.248$		

SOURCE: Own data
Notes*: 3 companies use other techniques.
Notes**: 9 companies did not provide any answer.

USEFULNESS OF FINANCIAL RATIOS DEFINED BY THE SAS

Usefulness of SAS ratios	Internal accounting service	External accounting service	Total (% of total)
Satisfies the needs	32	10	42 (89.4%)
Additional ratios are needed	5	0	5 (10.6%)
Total (% of total)*	37 (78.7%)	10 (21.3%)	47 (100%)
Chi-square test	X^2-value of 1.512; $p = 0.219$		

SOURCE: Own data
Notes*: 3 companies did not provide any answer.

THE USE OF BALANCED SCORECARD SYSTEM

Balanced scorecard use	Internal accounting Service	External accounting service	Total (% of total)
In use	4	1	5 (10.4%)
Not in use	33	10	43 (89.6 %)
Total (% of total)	37 (77.1%)	11 (22.9%)	48 (100 %)
Chi-square test	X^2-value of 0.027; $p = 0.870$		

SOURCE: Own data
Notes: 2 companies did not provide any answer.

ECONOMIC PERFORMANCE EVALUATION

Economic performance evaluation	Internal accounting service	External accounting service	Total (% of total)
ROE and/or ROA	21	8	29 (65.9%)
EVA-Economic value added and ROE and/or ROA*	12	3	15 (34.1%)
Total (% of total)	33 (75%)	11 (25%)	44 (100%)
Chi-square test**	X^2-value of 0.303; $p = 0.582$		

SOURCE: Own data

Notes*: 5 companies did not provide an answer.

Notes**: Other measures were excluded from the chi-square test (1 company).

SISTEMI MJERENJA PERFORMANSI: EMPIRIJSKI DOKAZI IZ SLOVENIJE

SAŽETAK

Cilj ovog rada je analiza korištenja sistema mjerenja performansi u velikim, srednjim i malim slovenskim poduzećima. Istraživanje je provedeno na temelju ankete koja je podijeljena menadžmentu slovenskih tvrtki u 2007. Istraženo je korištenje tehnika mjerenja peformansi u post-tranzicijskom periodu. Slovenske tvrtke uglavnom koriste tradicionalne tehnike mjerenja performansi. Suvremeni sistemi mjerenja performansi su se koristili samo povremeno. Osim toga, istraživanje dokazuje kako se tehnike mjerenja performansi razlikuju među tvrtkama različite veličine. Male tvrtke imaju manje razvijene sisteme mjerenja performansi koji se zasnivaju gotovo isključivo na tradicionalnim tehnikama mjerenja, dok velike tvrtke imaju razvijenije sisteme mjerenja performansi te se također koriste i nekim suvremenim tehnikama. Buduća istraživanja bi trebala analizirati strukturu sistema upravljačkog računovodstva u ekonomijama koje su dovršile tranzicijski period kako bi se dobili dokazi o promjenama koje se događaju nakon toga.

Ključne riječi: *sistem mjerenja performansi, sistem upravljačkog računovodstva, tranzicijska ekonomija.*

COUNTRY BRAND I FEEL SLOVENIA: FIRST RESPONSE FROM LOCALS

MAJA KONECNIK RUZZIER[1]
NUSA PETEK[2]

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- Slovenia
- I feel Slovenia

ABSTRACT

The paper analyses the concept of country branding. The focus is placed on influential stakeholders who should participate in country brand development and implementation. Specifically, the important role of local inhabitants is stressed. The paper focuses on the country branding in Slovenia and investigates the residents' first response to the new brand I feel Slovenia. The research was conducted half a year after the new brand was born. The results imply that the brand has great potential to become successful, since it is generally well recognised and perceived by its largest internal stakeholder group – local inhabitants.

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Not long ago a systematic and strategic country branding was introduced to branding theory. In the recent years a number of countries have started to adopt country branding principles. Similar steps are evident in Slovenia, since the Slovenian government has recognised the importance of building a strong country brand. Furthermore, they became aware that building a country brand firstly requires defining elements of Slovenian identity. The success of the county brand highly depends upon the identification of local inhabitants. Therefore, the paper investigates the inhabitants' first response to the new brand I feel Slovenia. The survey among residents was conducted half a year after the new brand was born. Since country branding is a long-term process, the results provide only the first feedback and opinions of the largest stakeholder group on the new brand I feel Slovenia. The survey results are encouraging and indicate that the new brand has great potential for success and long-term survival. Nevertheless, respondents also showed low identification with the I feel Slovenia brand and the lack of willingness to help in the brand's future development process. These results should be seriously investigated and appropriate steps should be implemented to include the locals into brand implementation.

I. INTRODUCTION

Seeking greater success and more recognition, many countries have started to plan how to manage and market themselves so as to find a unique position on the world map (Morgan and Pritchard, 2002). At the beginning, the whole process regarding country presentation related primarily to promotion or, even better, the advertising of the country. Nowadays, country branding is becoming more and more important, since powerful country brands add additional value to country equity. Countries with strong brands are more recognisable, have a better image and reputation, higher loyalty of their consumers, attract more investments and tourists, export more domestic products and have a higher standard of living (Moilanen & Rainisto, 2009). Due to these positive effects, countries have to manage their brand systematically and strategically. This is how country branding occurred.

It was only a few years ago that systematic and strategic country branding was introduced to academics and practitioners (Cai, 2002; Hankinson, 2005 and 2007; Konecnik & Gartner, 2007; Konecnik & Go, 2008; Morgan, Pritchard & Piggot, 2002). Some countries, which are perceived as pioneers in this area (i.e. Australia), already have positive and encouraging results regarding their equity. Therefore, it is not surprising that a number of other countries have slowly started to adopt the country branding principles that have been developed recently.

Governments from all over the world are aware more than ever that country branding is highly significant for future development. According to the World Tourism Organisation (UNWTO), most country promotion budgets are funded by governments, and the amounts of money spent on campaigns are enormous and still growing. UNWTO reports show that small countries, too, strongly believe in country branding, as even the smallest ones spend vast amounts of money on promotional campaigns (Mossberg & Kleppe, 2005). Nevertheless, governments have started to realise that the discussion on country campaigns does not

only concern the budget and resources spent mostly on advertising, but also the systematic development of the country brand and its long-term marketing, which should strive to go beyond advertising.

Similar steps are evident in Slovenia, a young European country, which declared its independence in 1991. In the last few years, the Slovenian government has recognised the paramount importance of building a strong country brand, and become aware that building a country brand does not only require finding a new slogan or logo and launching short-term advertising campaigns, but, more significantly, requires defining the essence of the country brand by developing the elements of Slovenian identity. The Slovenian identity can serve as a basis for further development of a fresh and unique story, which will help position Slovenia on the world map as a unique country.

With the purpose of positioning Slovenia on the world map as a unique country and consequently increasing its equity, the new brand I feel Slovenia was developed and implemented at the end of 2007. This was the first systematic branding process adopted in the short Slovenian history (Konecnik Ruzzier, Lapajne, Drapal & de Chernatony, 2009). In contrast to previous marketing activities of country brand Slovenia, at least the following two facts should be emphasised: firstly, the brand was developed from an identity perspective with an emphasis on its long-term survival and; secondly, all relevant stakeholder groups of the country were involved in the brand development and implementation, which is particularly important for its long-term survival and success.

The I feel Slovenia brand was developed for the whole country and not only for tourism purposes, which had generally been the practice in the past. The following key areas of Slovenia were selected: economy, tourism, culture, science, sports, state and the civic sphere. In order to capture the main perspectives on its development, all influential stakeholders were invited to participate in the project. The so-called three-step approach to identity building was employed, and the following three target groups were invited to take an active part in the brand development: opinion leaders from key areas, representatives of key areas, and finally, the largest stakeholder group - the residents of Slovenia.

Since the success of the country brand highly depends upon active participation and identification with the brand by local people, the main purpose of this paper is to present the residents' first response to the new brand I feel Slovenia. The survey among residents of Slovenia was conducted half a year after the new brand was born, thereby providing the first feedback and opinions of the largest stakeholder group that lives the brand.

II. COUNTRY BRANDING

Szondi defines the process of country branding as marketing of a country's economic, commercial and political interests both home and abroad. The key activities should therefore be focused on creating a strong country of origin effect, which would attract both investors and highly educated workforce (Szondi, 2007). Furthermore, Anholt (1998) argues that country branding refers to a reliable strategy which should consist of the most realistic, competitive and compelling vision for the country. The strategy should ensure that this vision is supported

by any kind of communication between the home country and the rest of the world (Fan, 2006).

Kotler and Gertner (2002) suggest that country names help consumers to evaluate products and are responsible for diverse associations. They either attract or avert their purchase decisions. The authors underline that even when countries do not manage their names as brand names, the latter still tend to trigger a certain image of the country. The biggest problem with these images lies in their longevity, since they are difficult to change. Perhaps even more alarmingly, most images are stereotypes and severe simplifications of reality and are generally not consistent with the real situation in the country. Mossberg and Kleppe (2005) compare a country image to a pool of associations, which is not connected to any particular context; a country image is thus comprised of all associations linked with the country. Country branding is consequently an essential activity when attempting to change the false associations to country images.

Kotler and Gertner (2002) define the necessary steps and tools for building a successful country brand:

1. formation of attractive, authentic and unique brand image;
2. defining characteristics that form a basis of a strong brand;
3. developing an umbrella concept to cover different kinds of branding activities;
4. appealing slogan;
5. appealing visual images and symbols;
6. organisation of special events.

Cai (2002) defines destination or country branding as a process of selecting a consistent element mix to identify and distinguish a destination through positive building of a destination image. The destination brand consists of different elements, such as name, term, logo, sign, design, symbol, slogan, package, etc. The name has a leading role, as it is relatively fixed and cannot be changed. Cai also emphasises that destination image formation does not equal destination branding. The key element of destination branding is brand identity formation.

Within Cai's (2002) contribution, it is clearly stressed that although the image is very important in the destination branding context, it is not the only dimension or perspective which should be highlighted in relation to the country branding concept. The emphasis lies in the identity concept, i.e. the perspective of the country's internal stakeholders (Konecnik & Go, 2008). Internal stakeholder groups play a highly significant role in the process of country branding, since they are the active players sending the signals about the situation in the country

and in long term contributing to formation of the country's image in the eyes of external stakeholder groups. Systematic and strategic country branding should therefore include and combine both (internal and external) perspectives on country branding (Konecnik & Gartner, 2007; Konecnik & Go, 2008; Konecnik & Ruzzier, 2008). Active participation of relevant internal stakeholders (Morgan, Pritchard & Piggot, 2002; Ryan, 2002) is essential for building a strong country brand, a brand that has high equity in the eyes of its external stakeholders.

Moilanen and Rainisto (2009) point to various benefits of strong country brands. The most important ones are export support because of the strong country of origin effect, promotion of tourism, attention of highly educated workforce, investors and decision-makers focus, country promotion via public diplomacy and high increase in feelings of national affiliation and self-esteem. Strong country brands thus help everyone from local inhabitants, companies and other organisations to the country and its diplomatic partners.

The role of local inhabitants or residents is extremely important in the process of country branding (Anholt, 2002; Konecnik & Go, 2008; Morgan, Pritchard & Piggot, 2002 and 2003; Pike, 2005; Ryan, 2002). From one point of view, residents can be treated as an internal stakeholder of the country, as this is the largest group that constitutes and lives the brand. Their active participation in the process of formation and especially in the process of brand implementation is precious. In this way, they act as ambassadors of the country brand. On the other hand, residents can also be treated as an external stakeholder (i.e. like domestic tourists, consumers, etc).

III. STRONG COUNTRY BRANDS AND THE PROCESS OF COUNTRY BRANDING IN CENTRAL AND EASTERN EUROPEAN COUNTRIES

As the country branding theory and practice is evolving and developing, much interest is directed to measuring the strengths of brands. This begs the question: which countries can be claimed to have strong country brands? Among researchers and practitioners, there is no uniformly accepted measurement instrument or index. During last few years, the Anholt Nation Brands Index (NBI) and the FutureBrand Country Brand Index (CBI) have gained in significance. Both indexes measure the country brand equity and will be shortly compared in the following section.

In order to measure the power and appeal of a country's brand image, Anholt introduced an analytical ranking of country brands called the Anholt-GfK Roper Nation Brands Index. Each quarter, people from all over the world take part in a survey that measures their perceptions of 50 different countries. They are asked to evaluate six dimensions of country assets: people, culture and heritage, exports, governance, tourism, and immigration and investment. The overall sum assesses the power and appeal of a country brand (GfK Roper Public Affairs & Media, 2008).

Another model that measures the country brand strength was developed by FutureBrand and is called the Country Brand Index (CBI). The framework is based on eight dimensions

which identify strengths and assets that can help in the future development of the country brand platform. The framework is divided into two parts: the needs-based dimensions and the wants-based dimensions. Infrastructure, geography, economy and governance compose the needs-based dimensions, whereas the wants-based dimensions are comprised of attractions, authenticity, ethos and culture (FutureBrand, 2008).

TABLE 1— Top 10 country brands - NBI and CBI comparison for the year 2008

	NBI 2008	CBI 2008
1	Germany	Australia
2	France	Canada
3	United Kingdom	United States
4	Canada	Italy
5	Japan	Switzerland
6	Italy	France
7	United States	New Zealand
8	Switzerland	United Kingdom
9	Australia	Japan
10	Sweden	Sweden

SOURCE: Anholt-GfK Roper NBI, 2008 and FutureBrand Country Brand Index, 2008.

Table 1 offers a comparison of the two country brand evaluation indexes for the year of 2008. Although country positions differ, the countries that made it to the top 10 are mostly the same. Eight out of ten country brands are ranked in the first ten positions in both indexes (Australia, Canada, United States, Italy, Switzerland, France, United Kingdom, Japan, Sweden). The results imply that those eight country brands are the most powerful ones. However, there are still considerable variations between country positions in the two indexes (for instance, Germany, which is the strongest brand in the NBI 2008, is not even included in top 10 country brands according to the CBI 2008). The reasons for variations can be attributed to the use of diverse dimensions and different model formation. Considering the dimensions employed, it can be concluded that the Anholt-GfK Roper NBI is more general, while the FutureBrand CBI has more parameters connected only to tourism. Nonetheless, the results of both rankings are very useful to show which country brands are perceived as the most powerful ones.

Since Australia is one of the pioneers of country branding, it is not surprising that its brand is one of the leading country brands in the world. Indeed, both above presented indexes confirm its strength. The awareness of the Australian brand in the USA was considerable already in the 1980s due to the launch of the country presentation campaign known as the "shrimp on the barbie" campaign. The campaign's advertisement "Come and say G'day" was so successful that it still remains the most memorable campaign ever launched by a foreign country in the USA. The campaign had everything needed to create a powerful brand. The

advertisement presented Australia as a country with its own personality. The country was portrayed as friendly, fresh, different and full of adventures, fun and energy, thus sending out a completely different image from others (Blackadder, 2006). The same marketing and advertising for the brand of Australia was in use until 2006, when Tourism Australia launched a new campaign named "Uniquely Australian Invitation" with the slogan "So Where The Bloody Hell Are You?". The aim of the new campaign was to change consumers' behaviour and encourage people to become more actively involved with planning their visit to Australia. According to the first results, the new campaign is successful and has already gained positive feedback from locals and foreigners (Tourism Australia, 2007).

The most powerful country brands in the world have at least three characteristics in common: they have a long history, their economy and standard of living is very high, and all of them have a stable political environment. Contrary to countries that have strong brands with high equity, a number of countries have yet to find the appropriate way of presenting themselves on the world map and building a strong country brand. Among many others, these include transition countries from Central and Eastern Europe, which were marked by the change from the communist regime to the formation of their own democratic state. Indeed, they have faced comparable challenges when marketing their country abroad (Hall, 2002; Hughes & Allen, 2009; Konecnik, 2004; Szondi, 2007).

Country brand development in the region of Central and Eastern Europe is focused mainly on visualisation and symbolism. National tourist boards, which generally become guardians of country brands, are therefore concerned about developing logos, slogans and other design elements. Logos either contain country names in English or in their own language, like, for example, "Lietuva" for Lithuania. Sun, sea, sky, flowers, mountains and hearts are the most commonly used country symbols. Logos, on the other hand, mainly reflect the colours of their national flags. Since countries from this region tend to employ highly similar country images, their campaigns have not been as successful as they were hoped to be. Consequently, none of these countries have succeeded in differentiating themselves from their competitors or distinguishing themselves as a unique tourism destination (Szondi, 2007).

In light of previous findings, Szondi (2007) defined the most common challenges and mistakes in country branding in Central and Eastern Europe:

1. late beginning of country branding, not before the 1990s;

2. country promotion depends on political interests;

3. short-term thinking;

4. lack of coordination among organisations responsible for country branding;

5. lack of both financial and human resources;

6. lack of strategy and continuous development;

7. no differentiation among diverse countries;

8. slogans and messages are too general and old-fashioned;

9. too much advertising and lack of public relations;

10. messages and country images are not credible and transparent;

11. local people do not identify with the brand and do not support it.

IV. THE SLOVENIA BRAND

After declaring independence in 1991, Slovenia immediately started taking partial steps to build its country brand. Although it used to be a part of former Yugoslavia, it had always been closer to the countries of Central Europe than to Balkan countries. Hence, after independence its country brand development focused on distancing Slovenia from the old economic and political system before the transition. The rebranding of the country had an aim to disassociate the country from the notion of "Balkan-ness" and instead promote itself as a Central European country (Hall, 2002).

The first country branding campaign was launched in 1986, when Slovenia was still part of the former Yugoslavia. "Slovenia – my country" was a campaign that was immediately accepted by local inhabitants. One of its goals was to raise national awareness and self-esteem of locals. The slogan "Tourism are people" encouraged inhabitants to market Slovenia to foreigners, and in this way fostered involvement in the branding process. In the same period, the slogan "On the sunny side of Alps" was launched to promote Slovenia on foreign markets. The entire campaign was accompanied with a linden leaf logo that represented a symbol of Slovenian identity. The campaign (including slogans and logo) was in use for a period of ten years and was well perceived by locals and foreigners.

In 1996, the logo as well as slogan changed. The linden leaf was replaced by a bundle of flowers, which was in use until 2006. The bundle of flowers logo was not well accepted by locals, but it was positively adopted by tourist workers, since they used it in promotional activities for a decade. During this period, slogans were frequently changed. In not more than an 8-year period, there were attempts to use at least five slogans, among which the slogan "The green piece of Europe" was used most commonly. In 2004, with the accession to the European Union, a new campaign and slogan "Slovenia invigorates" was introduced. This campaign represented the first attempt to establish a brand and slogan not only in the field of tourism, but also in other areas. The campaign was discontinued in 2006, since foreigners

as well as Slovenians had many difficulties understanding both the campaign and the slogan. All marketing activities during this period were primary focused on and oriented to foreign markets and not to local inhabitants.

In addition to a variety of slogans and attempts to build the brand of Slovenia in its short history, several additional marketing activities were prepared for specific purposes only and aimed at specific media. These campaigns were not designed in line with brand directions. One of such was the advertisement about Slovenia on CNN Europe, implemented by the Slovenian Tourist Board in 2006. The advertisement was accompanied by a slogan "Slovenia, a diversity to discover", which was used only in this campaign. Moreover, the bundle of flowers, Slovenia's official logo in that period, was replaced by the Slovenian flag.

Looking through the short Slovenian history and its brand development, we can conclude that the majority of mistakes in country branding in Central and Eastern Europe, stressed by Szondi (2007), can also be observed in branding Slovenia. To indicate only the most important ones: lack of strategy and continuous development evident in short-term thinking; too frequent slogan changes, which were, at least in the recent period, too general and did not differentiate Slovenia from its competitors; the emphasis was based only on advertising, while other marketing tools were not used enough; lack of knowledge about effective country branding; in the period of the last 10 years, local people did not identify with the brand, nor did they support it, which was one of the reasons for frequent changes in separate marketing activities and campaigns.

Excessive and too frequent changes (mostly in slogans) were met with opposition and negativity, as Slovenian residents felt that future attempts of brand development would fail to be successful. Finally, the Slovenian government recognised that the country did not only need a new slogan and logo, which had been the main discussion until that period, but also a real and systematic branding strategy to be followed in future management and marketing activities for Slovenia.

In 2007, a large-scale project for building the country brand of Slovenia was implemented (Konecnik Ruzzier, 2011; Konecnik Ruzzier & de Chernatony, in press). The latest findings in the field of country brand development and marketing were considered (Cai, 2002; Morgan & Pritchard, 2002; Morgan, Pritchard & Piggot, 2002 and 2003). The new project differed from past country marketing activities primarily in the following two aspects: brand development was carried out from an identity perspective and aimed at the brand's long-term survival, and all relevant stakeholders of the country participated in brand development and implementation, thus paving the way for its long-term survival and success.

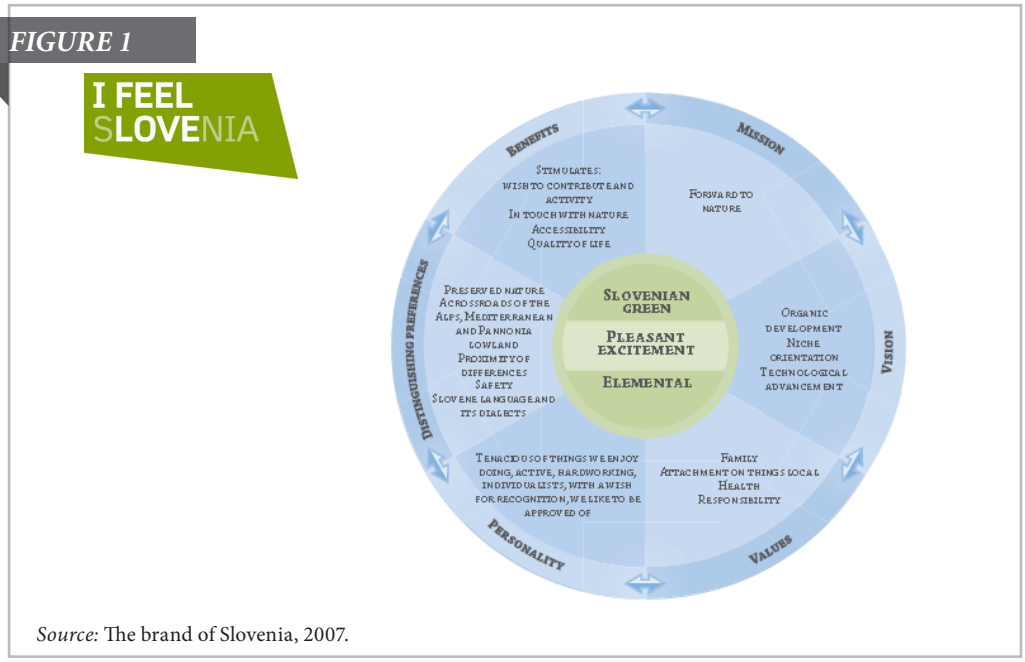
The new Slovenia brand was not built merely for tourism purposes, as it had been the case in the past, but instead strove to embrace all important parts of Slovenia. The following key areas were included: economy, tourism, culture, science, sports, state and the civic sphere. Furthermore, in order to gain important feedback on the topic, all crucial stakeholders were invited to take part in building Slovenia's brand identity. Employing a three-step approach to identity building, the following target groups were invited to actively participate in the brand development: opinion leaders from key areas, representatives of key areas and the largest target group - the residents of Slovenia.

During the I feel Slovenia brand development, the efforts were aimed at including identity

characteristics of the country of Slovenia, and ensuring that the key idea, which was to be communicated at home and abroad, would be clear and simple. All identity elements clearly indicate the necessity of including nature and natural concepts in the Slovenia brand (Figure 1). The identity elements (vision, mission, values, personality, benefits and distinguishing preferences) served as a starting point for developing the story of the Slovenia brand, constantly interacting to fulfil brand promises at the functional, emotional and experiential level. The Government Communication Office became the brand guardian, and its mission for the following years is to present the brand to local inhabitants and foreigners.

BRAND I FEEL SLOVENIA

FIGURE 1



Source: The brand of Slovenia, 2007.

During the process, our aim was to develop a brand and marketing strategy that would be considerably different from branding strategies applied in other countries. In relation to that, the following features of the I feel Slovenia brand should be pointed out. Firstly, the principal identity meaning of the brand is generated through the experiential promise of the Slovenian green. In this context, the shade of green is not associated solely with the colour, but also with the entire experience that one enjoys in Slovenia. Secondly, the mentioned identity story is narrated through its two visual elements (slogan and logo). Designed in accordance with the suggested colour, the logo serves as an enhancement of the slogan, while the brand carries the same name (Figure 1).

V. RESEARCH ON THE FIRST RESPONSE OF LOCALS TO THE NEW BRAND I FEEL SLOVENIA

The survey on the first response of locals to the new brand I feel Slovenia was conducted in July 2008. The sample for data analysis included 200 residents of Slovenia, who were interviewed in person in the three largest Slovenian cities: Ljubljana, Maribor and Novo mesto. The sample is a convenience sample.

The main research goal was to obtain local inhabitants' first reactions and responses to the new brand I feel Slovenia. The survey refers to Slovenian inhabitants only and not to the foreign public, since past experience showed that brands which were accepted by locals could survive and be successful for a long period.

It should be noted that the study was conducted half a year after the brand formation, which is a relatively short period of time for this kind of research. Within this period, only a few marketing activities were implemented in relation to the new brand, which centred merely on some branding aspects, such as the slogan, logo, colour and main story, and less on the brand's identity elements. Before the survey was carried out, the following general or specific marketing activities were undertaken: the brand development process was intensively covered by the Slovenian media; some promotional material was prepared; brochures were sent to all Slovenian households at the beginning of July 2008; and at the beginning of July 2008, advertisements about I feel Slovenia were released in print media and related billboards were launched. This should be born in mind when interpreting the results regarding the residents' first response.

Stemming from the above mentioned facts, further hypotheses guided our study:

Hypothesis 1: Slovenians will be aware of the new brand I feel Slovenia and have some knowledge about it.

Hypothesis 1 a: Slovenians will be familiar with visual elements of I feel Slovenia brand.

Hypothesis 1 b: Slovenians will be less familiar with separate brand identity elements.

The study instrument included questions about the knowledge of and first response to the new brand I feel Slovenia. Furthermore, some questions compared the new brand with previous branding activities in Slovenia. Sociodemographic questions about respondents were added at the end of the study instrument. With the exception of one question, the study instrument included closed questions. All closed questions can be placed into one of the following categories. First, most questions required respondents to select one or more answers. The answers to the latter are analysed as percentages. Second, some questions included Likert-type scales, where respondents ranked items on a scale from 1 to 5 (1 means strongly disagree and 5 means strongly agree). These types of questions are analysed with means and standard deviations. Third, in one closed question, respondents had to rank the indicated slogans according to their preferences. The results of this question are analysed as percentages. The only open question referred to the recall of brand logo, where respondents were asked to draw it or describe its characteristics with a few words.

VI. RESULTS AND DISCUSSION

A. Sample

The sample consisted of 200 respondents, 55 percent of which were female and 45 percent male. Most were aged from 25 to 34 years (31.5 percent), followed by the age group up to 24 years (27 percent). Fifty-five point five percent of respondents fell in the 35 to 44 age range, while a lesser percentage belonged to the age range of 45 to 54 years (13.3 percent). Nine percent were aged between 55 and 64 years, with the smallest share of respondents aged 65 or more (3.5 percent). Respondents were from all parts of Slovenia. The largely represented region of residence was Dolenjska with Bela Krajina (32.5 percent), followed by central Slovenia (26 percent), Stajerska (24.5 percent) and less represented Gorenjska (6.5 percent). Other regions were represented with 2.5 percent of less. Thirty-five point five percent of the interviews were carried out in Ljubljana, 32.5 percent in Novo mesto and 32 percent in Maribor.

B. Recognition of the new brand I feel Slovenia and noticing initial marketing activities

To begin with, respondents' recognition of the new Slovenia brand was examined. Seventy-one percent stated that they had heard about the new country brand, whereas 29 percent of them answered that they had not heard about it.

We were interested in when and where respondents first noticed initial general marketing activities of the I feel Slovenia brand. Most of them, 34 percent, became familiar with the new brand at the end of 2007, during the process of brand development. A smaller share, 20 percent, first noticed brand-related activities during the first three months of 2008, from April to June (16.5 percent) and from the beginning of July until the day of the interview (7 percent). Communication activities were not observed by 22 percent of participants. We also asked respondents about the media to find out where they noticed marketing activities. The majority saw the brand marketing activities on television (48.5 percent), followed by print media (25.5 percent), billboards (24 percent) and tourist brochures (13.5 percent). Only 5.5 percent heard about the new brand on the radio, not more than 3 percent read the Guide to the brand of Slovenia, while 3.5 percent noticed promotion in other places (tourist fairs, promotion brochures or heard about it from friends).

Further on, respondents were asked about noticing any kind of special promotional material and communication activities of the I feel Slovenia brand. The majority, 48.5 percent, were familiar with promotional material (T-shirts, caps, paper bags, etc.), followed by household brochures with 43 percent. Moreover, 27 percent of respondents already visited the brand's webpage. Special newspaper advertisements and billboards, which had been released at the beginning of July 2008, were indicated least frequently (only by 13.5 percent of respondents).

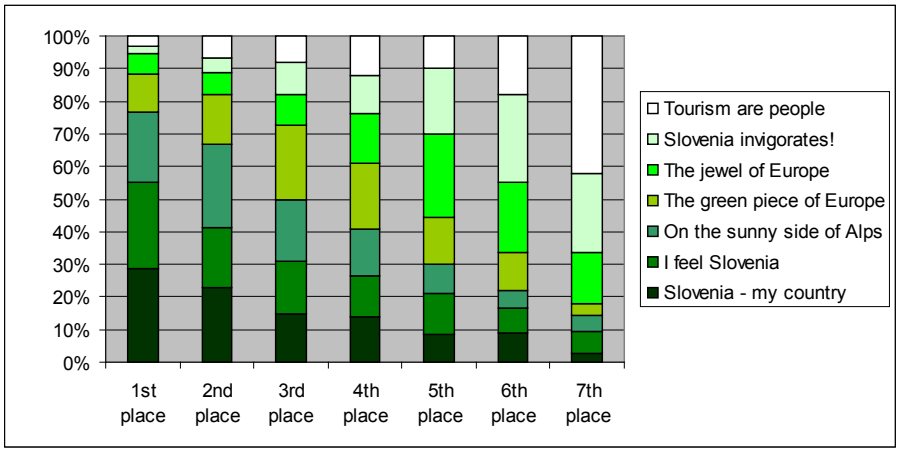
C. Visual identity of the new brand I feel Slovenia

It was discovered that the slogan "I feel Slovenia" is very recognisable, since 86 percent of respondents successfully identified it as the new slogan. "The green piece of Europe" was identified as Slovenia's new slogan by just 7.5 percent of respondents, and was followed by slogans "Slovenia – my country" (3 percent), "On the sunny side of Alps" (2.5 percent) and "Slovenia invigorates" (1 percent). The results show that the recognition of the new slogan is very high.

Going even further, we asked respondents about their slogan preferences. The majority put two slogans on the first place, that is, the slogan of the "Slovenia – my country" campaign (28.5 percent) and the new slogan "I feel Slovenia" (26.5 percent), while the slogan "On the sunny side of Alps" made it to the second place and "The green piece of Europe" to the third and forth place. The slogans that followed were: "The jewel of Europe" on the fifth place, "Slovenia invigorates" on the sixth place and "Tourism are people" at the very end. The survey results indicate that the slogan "Slovenia – my country" remains the favourite slogan among respondents. However, the new slogan, "I feel Slovenia", was positioned very close to it. Until today, no other slogan came as close to the first campaign as this one, which is a very good indication. We can assume that the new brand could become at least as popular as the first campaign. The results of respondents' preferences are shown in Figure 2.

RESPONDENTS' PREFERENCES OF SLOGANS

FIGURE 2



SOURCE: Author

High recognition of and high preferences for the new slogan were confirmed in both statements that required respondents to use a scale from 1 to 5 (Table 2). Both statements regarding slogan perception were rated higher than the neutral mean (3). "I like the new slogan" was rated with a mean of 3.45, while the statement about the slogan not being too

general received the mean score of 3.11. Nevertheless, standard deviation of the first statement is 1.11 and 1.05 regarding the second statement, which tells us that variability in opinions about the statements is high. Values in the data set are on average spread farther away from the mean, which tells us that respondents' opinions regarding the slogan were quite different. We also merged both sentences, calling the new construct the likeliness of the slogan. The value of Cronbach's alpha was 0.676.

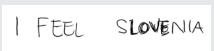
TABLE 2— Mean values and standard deviations for rating of slogan "I feel Slovenia"

Statements	Mean	SD
I like the new slogan "I feel Slovenia".	3.45	1.11
The slogan "I feel Slovenia" is not too general.	3.11	1.05

Notes: 1 - strongly disagree
5 - strongly agree
SOURCE: Author

Furthermore, the recall and knowledge of the new logo were examined, as respondents were requested to sketch the brand logo. The sketches were then classified into five different groups according to the recall of the new logo (Table 3).

TABLE 3— Sketches of the recalled "I feel Slovenia" logo

Example	Group 1	Group 2	Group 3	Group 4
				

SOURCE: Author

The first group represents the precisely drawn logos, which means that respondents drew a correct quadrilateral and indicated the green colour as well as the bolded phrase "I feel love" inside the slogan "I feel Slovenia". Four point five percent of participants sketched the new logo correctly, while 5 percent drew the logo nearly properly, missing one of its characteristics. The third group comprises drawings that included just the written slogan, without the logo; those amounted to 17.5 percent. Respondents from the fourth group sketched logos of past presentation campaigns and other state symbols (10 percent), whereas 63 percent of respondents did not manage to recall or draw any logo. Based on survey results, we can conclude that the recall of the new logo is not very high among respondents.

In addition to logo recall, we were interested in whether respondents liked the logo and found it recognisable (Table 4). The statement about liking the new logo was rated with a mean of 3.32, while the statement about the logo being very recognisable was also rated higher than the neutral mean, i.e. 3.07. Standard deviations for statements are 0.94 and 0.83 respectively, which tells us that the variability in respondents' opinions of the new logo was quite high. The new likeliness construct of the new logo, where both sentences were merged, is reliable, with Cronbach's alpha of both statements amounting to 0.759.

TABLE 4— Mean values and standard deviations for rating of the I feel Slovenia logo

Statements	Mean	SD
I like the new logo of the Slovenia brand.	3.32	0.94
The slogan "I feel Slovenia" is not too general.	3.07	0.83

Notes: 1 - strongly disagree
5 - strongly agree

SOURCE: Author

In contrast to a low recall of the new logo, logo likeliness and its recognition received more favourable responses. Both statements were rated higher than the neutral mean, which implies higher agreement than disagreement with proposed sentences.

According to the above presented results, Hypothesis 1 a can be confirmed. On average, Slovenians were aware of the new brand, especially there were familiar with the new slogan I feel Slovenia.

D. Brand identity I feel Slovenia

In addition to knowledge and likeliness of the visual elements of the new brand, we also asked respondents about the content of the brand. Thirty-five percent of them answered that they were familiar with the brand content, 33 percent of them had some idea about the content, while 32 percent were not familiar with it.

Similar results regarding the brand content are evident in responses to the statement "I know a lot about the content of the new brand I feel Slovenia", which was rated with the mean of 2.98 and standard deviation of 1.12. The results imply that respondents neither agree nor disagree with the proposed statement. They usually have some general idea about the brand content, but are not familiar with all identity characteristics of the new brand.

The majority of respondents recognised that the main colour denoting the new brand is green. The green colour was chosen by 76.5 percent of respondents. The second stated colour was blue (10.5 percent), which was followed by red (5.5 percent), white (4.5 percent) and yellow (2.5 percent). Respondents' high agreement regarding green as the most appropriate colour for our country was also confirmed in responses to the statement "The green colour describes the country of Slovenia the best", with a mean of 4.14 and standard deviation of 0.83.

Moreover, we investigated respondents' identification with the I feel Slovenia brand and their willingness to help in the brand's future development process (Table 5). With regard to the three proposed statements, respondents reported that they had not identified themselves with the new brand yet and did not feel like brand contributors at the time of investigation, nor were they willing to contribute to its development in the future. Also here standard deviations reflect quite a large amount of variability in the proposed statements. Furthermore, the three sentences were combined in the construct of identification with the brand's identity, with

Cronbach's alpha at 0.764.

TABLE 5— Means and standard deviations of respondents' identification with the brand

Statements	Mean	SD
I can identify myself with the brand.	2,80	1,03
I feel like a contributor to the brand.	1,96	1,02
In the future, I will contribute to the brand's development.	2,32	1,02

Notes: 1 - strongly disagree
5 - strongly agree

SOURCE: Author

According to these results, it can be speculated that such low identification and willingness to contribute to the I feel Slovenia brand partly relates to not being familiar with the brand content, story and identity. Therefore the hypothesis 1 b can be confirmed. Furthermore, the reason for the low motivation for brand contribution could also be attributed to past branding activities of the country, which were subject to rapid changes in the past. Consequently, respondents no longer believe that the new brand has a brighter future. Our findings imply that additional efforts are needed in the future to bring the I feel Slovenia brand closer to local inhabitants.

VII. CONCLUSION

Countries in the global marketplace are facing the greatest challenges ever. The signals they are sending to the world are becoming increasingly important, since a lot of countries are fighting for the same achievements, such as more investments, larger numbers of tourists, higher exports of their goods and services, and enhanced reputation. Instead of merely taking country branding into consideration, governments must work strategically and systematically on their country brands.

It is not easy to build a strong country brand in a saturated marketplace, as they are even more complex than other types of brands. The brand manager or guardian of a country brand must therefore take into account a variety of influential stakeholder groups that constitute and live the brand. Influential stakeholders should be invited to take an active part in brand formation or development, as well as in its further implementation. The brand guardian, many times the government or national tourist board, needs to take care that the most important country characteristics, as perceived by influential stakeholders, are integrated in the brand's identity and story. The guardian also needs to ensure that the new brand can truly offer the promised characteristics and experiences.

The role of local inhabitants or residents is extremely significant in the process of country branding. Many studies stress (i.e. Morgan, Pritchard and Piggot, 2002 and 2003; Szondi, 2007) that the success of the country brand highly depends upon the active participation and identification with the brand of local people, who could be treated primarily as an internal, but also as an external interest group.

This paper discusses the first response of local inhabitants to the new brand I feel Slovenia.

The review of branding activities of Slovenia in its short history is presented, analysing the process of country branding from past presentation campaigns to the systematic and strategic development of the I feel Slovenia brand. Due to the first systematic approach undertaken in the branding process, which has been developed as a result of collaboration and opinions of various stakeholders, the brand has huge potential for future success. Local inhabitants were invited to take an active part in brand development. In addition, their role in brand implementation was considered precious. Therefore, obtaining the first response of locals to the new brand was crucial. The results imply, that the main hypothesis of the study can be confirmed, because Slovenians were aware of the new brand I feel Slovenia and had some knowledge about it. The research was conducted only half a year after the new brand was born. Since country branding is a long-term process, the survey results provide only the first feedback on the new brand I feel Slovenia.

Research results reveal that the recognition of Slovenia's new country brand is high, as 71 percent of local inhabitants stated that they were familiar with it. A considerable number of respondents (34 percent) heard about the new brand already during the process of brand development, mostly likely due to the fact that this significant topic and systematic branding approach were covered regularly in the most important Slovenian media. The slogan "I feel Slovenia" was very recognisable despite the short period of its existence, since 86 percent of respondents identified it as the new slogan. In addition, it was ranked very high among the preferences, even in comparison to the best campaigns and slogans in the short Slovenian history. The slogan was also well rated with respect to the construct of likeliness. The recall of the new logo was not very high; however, its recognition and likeliness were rated quite well among locals. Undoubtedly, the above survey results are encouraging and indicate that the new brand has great potential for success and long-term survival.

In contrast to encouraging results regarding the new brand and its visual identity recognition, some findings imply that further work on the brand is needed. Only thirty-five percent of respondents reported that they were familiar with the brand content, while 33 percent of them had some idea about the content, probably relating to the main brand colour. The green colour was chosen by 76.5 percent of respondents. According to respondents' opinion, green is the most appropriate colour for denoting our country. Having relatively little knowledge about the brand content can be partly ascribed to respondents' low identification with the I feel Slovenia brand and the lack of willingness to help in the brand's future development process. These results should be seriously investigated and appropriate measures should be implemented to include the locals into brand implementation. In order to encourage local inhabitants to become actively involved in promoting and living the new brand, the guardian could, for example, organise price-winning games and award winners with promotional material of the I feel Slovenia brand.

The presented research results show that the brand guardian will still have to face a number of challenges. The branding process was developed systematically; in the future, it is time for its implementation on domestic and foreign markets. As the focus in this paper was placed only on the domestic market, some ideas on implementing the brand among local inhabitants are provided. It should be noted that systematic and related branding activities can bring the I feel Slovenia brand closer to local inhabitants. The real success of the brand will be reached only when the Slovenians and local organisations use and live the new brand. The results will thus be seen on a long-term basis.

The research has several limitations. First, as was already mentioned, it was conducted only half a year after the new brand was born, which is a really short time for this kind of study. Second, since the convenient sample was chosen as a non-probability sample, we cannot extrapolate conclusions from the sample to the whole Slovenian population. Third, to truly capture the locals' identification with the new brand, more indirect statements should be proposed in the questionnaire. The present study should be replicated on a probability sample of local inhabitants in a reasonable period of time.

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DRŽAVNI BREND I FEEL SLOVENIA: PRVI ODAZIV NA LOKALNOM NIVOU

SAŽETAK

Rad analizira koncept brendiranja države. Središte pažnje je na utjecajnim dionicima koji bi trebali sudjelovati u razvoju i implementaciji branda. Točnije rečeno, naglašava se iznimno važna uloga lokalnog stanovništva. Rad se usredotočuje na brendiranje države u Sloveniji i istražuje prvi odgovor stanovnika na novi brend I feel Slovenia koji je implementiran 2007. Istraživanje je provedeno godinu i pol nakon uvođenja novog branda. Rezultati ukazuju na to da brend ima velike potencijale za uspjeh jer je općenito dobro prepoznat i percipiran od strane najveće unutarnje interesne skupine – lokalnog stanovništva.

Ključne riječi: *brend, država, lokalno stanovništvo, Slovenija, I feel Slovenia.*

TOURISM DESTINATION COMPETITIVENESS- BETWEEN TWO FLAGS

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ABSTRACT

The study aims to provide a better understanding of destination competitiveness and elements that affect competitive position of a tourism destination. The research is design as a comparative study of Slovenia and Serbia. For analysing a competitiveness of mentioned destinations, the Integrated model of destination competitiveness was used. The results showed that both destinations are considered to be more competitive in its natural, cultural, and created resources, but less competitive in the destination management and, according to the Integrated model, demand conditions. Based on these findings, relevant proposals are made in order to improve competitive positions of destinations.

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I. INTRODUCTION

The continuous development of new tourist destinations and the growth of the existing ones impose the need for continuous and responsible destination management in order to achieve and maintain an appropriate level of competitiveness. Tourism competitiveness is an ability of destination to meet visitor needs on various aspects of the tourism experience (Ritchie, Crouch, 2003) which means that competitive position of a destination on the tourism market, depending on which and how well the destination resources are managed. Thus, destination's competitiveness can be advanced if there are adequate matches between tourism resources and management of the destination and this is simultaneously the guiding principle of the study.

In order to achieve proper matches between tourism recourses and management strategies, it is necessary for the industry and government to understand where a country's competitive position is the weakest as well as strongest. In addition, it is helpful for both industry and government to know how competitiveness is changing and why these changes are occurring (Dwyer, Forsyth & Rao, 2000).

The main aim of this study is to answer the following questions: What are the main weaknesses of the tourism industries of these two countries and how could their competitive positions be improved? In order to provide answers to the research questions, the authors applied an Integrated model of destination competitiveness created by Dwyer et al. (2003) to Serbia and Slovenia. The authors decided to research and compare the competitiveness of two mentioned destinations because these countries were former states of Republic of Yugoslavia till 1991, when Slovenia became an independent state. As former states of Yugoslavia, these two countries have great geographical, historical, and cultural similarities. However, the two countries are assumed to have different level of competitiveness, but encounter the same obstacles while striving to achieve better competitive position.

This research has been designed as a comparative study of Slovenia and Serbia. By providing a cross-country analysis of the drivers of tourism industry competitiveness, we intend to provide the industry with useful comparative information that could be used as an important benchmarking tool for making decisions related to tourism industry development. Additionally, the analysis provides an opportunity for the tourism industry to highlight to national policymakers the obstacles to tourism competitiveness that require policy attention, in order to improve the environment for developing the tourism industry on the national level.

II. DESTINATION COMPETITIVENESS AND INTEGRATED MODEL OF DESTINATION COMPETITIVENESS

In recent literature, the analyses and measurement of tourist destination competitiveness have attracted increasing interest (Alavi & Yasin, 2000; Crouch & Ritchie, 1999; Enright & Newton, 2004; Kozak, 2002; Ritchie & Crouch, 2000; Ruhanen, 2007; Mihalič, 2000; Thomas & Long, 2000; Kim & Dwyer, 2003, Hassan, 2000; Kozak & Rimmington, 1999; Dwyer et al, 2011). However, the most detailed work undertaken by tourism researchers on overall tourism competitiveness is that of Crouch and Ritchie (1994, 1995, 1999) and Ritchie and Crouch (1993, 2000). According to the mentioned authors, destination's competitiveness is defined as a country's ability to create added value and thus increase the national wealth by managing assets and processes, attractiveness, aggressiveness and proximity, and thereby integrating these relationships within an economic and social model that takes into account a destination's natural capital and its preservation for future generations (Ritchie & Crouch, 2003).

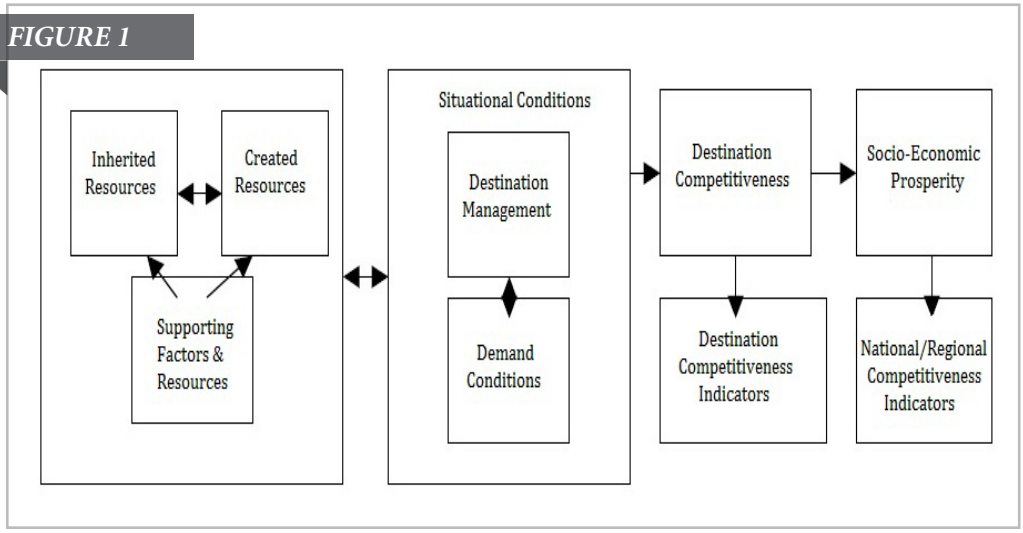
In 2003 authors Ritchie and Crouch presented a version of their competitiveness model: a Conceptual Model of Destination Competitiveness. Later, based on the Conceptual Model of Destination Competitiveness, authors Dweyer et al. (2003) developed a Integrated model of destination competitiveness. The model displayed as Figure 1 brings together the main elements of national and firm competitiveness as proposed in the wider literature (Porter, 1990; Moon, Peery, 1995; Waheeduzzan, Ryans, 1996) and the main elements of destination competitiveness as proposed by tourism researchers (Buhalis, 2000; Hassan, 2000; Mihalic, 2000). Space limitations preclude a more detailed discussion of the background literature on competitiveness (but see Dwyer, Kim, 2003). The model contains many of the variables and category headings identified by Crouch and Ritchie (1994, 1995, 1999) and Ritchie and Crouch (1993, 2000) in their comprehensive framework of destination competitiveness but differs in some important respects.

From the perspective of our study, the Integrated model was the most relevant because it brings together the main elements of destination competitiveness, it provides a realistic display of linkages between various elements opposite to Crouch and Ritchie model. Additionaly, this model provides a useful distinction between inherited and created resources, and the category management– an important issue of our research – which includes all relevant determinants that shape and influence a destination.

Finally, according to its authors Dwyer et al. (2003) „the model seek to capture a set of indicator that can be used to measure the competitiveness of any given destination. Ideally, the model should be used to compare the performance of different destinations worldwide in respect of competitiveness". For detailed discusion on differences between two mentioned models see Dwyer and Kim (2003).

INTEGRATED MODEL OF DESTINATION COMPETITIVENESS:
THE MAIN DETERMINANTS

FIGURE 1



SOURCE: Author

The Integrated model defines the six main categories of competitiveness as shown in Figure 1: inherited resources (INH), created resources (CRE), supporting factors and resources (SUP), destination management (MAN), demand conditions (DEM) and situational conditions (SIT).

Inherited and Created Resources allocated their own box, as well as Supporting Factors and Resources. These three boxes are in turn, grouped within a larger box. Together, these factors provide the various characteristics of a destination that make it attractive to visit and the foundations upon which a successful tourism industry is established. Together, they provide the basis for destination competitiveness (Dwyer, Kim, 2003).

Destination Management includes the factors that can enhance the appeal of the core resources, attractors, strengthen the quality and effectiveness of the supporting factors, and best adapt to the situational conditions (Crouch, Ritchie 1999). The model contains a separate box for Demand Conditions. This category comprises three main elements of tourism demand-awareness, perception, and preferences. Situational Conditions are forces in the wider environment that define the limit, or influence the potential of destination competitiveness. These forces can moderate, modify or mitigate destination competitiveness by filtering the influence of the other groups of factors and thus may be positive or negative in their influence on competitiveness (Dwyer, Kim, 2003). There seem to be many types of such factors, e.g. location, micro and macro environment, security and safety, and price competitiveness (Gomezelj & Mihalič, 2008).

The box representing Destination Competitiveness is linked to the box Destination competitiveness indicators, which are created based on the six main categories as shown in the Figure 1. Further, box Destination competitiveness is connected to the boxes Social-Economic Prosperity and National/Regional competitiveness Indicators indicating that, according to the authors of the model, the destination competitiveness is itself an intermediate goal toward a more fundamental aim of socio-economic well being for residents. Indicators of national/

regional competitiveness, which derives from socio-economic prosperity, are referring to key macroeconomic variables including productivity levels in the economy, aggregate employment levels, per capita incomes, rate of economic growth etc.

In respect to the main aim of this study, the authors decided to eliminate two boxes of the original model: Social-economic prosperity and National/Regional Competitiveness Indicators. Namely, socio-economic prosperity of the destination is not taken into study because it refers to a long-term maintenance of competitiveness on the international tourist market and on that basis achieving economic prosperity of a destination. However, since the goal of this study was to identify the current weakest and strongest points of Serbian and Slovenian tourism industries and not to follow the long-term effect of competitive position on the tourism market, socio-economic prosperity of the destination was eliminated.

III. HYPOTHETICAL CONSTRUCTION

The guiding principle of this study is that a destination's competitiveness can be advanced through adequate matches between tourism resources and destination management. Hence, tourism will take a successful position on the tourism market depending on which and how tourism attractions add value for the tourists and how well destination resources are managed. However, previous studies on destination competitiveness of Slovenia (Sirče, Mihalič, 1999; Gomezelj, Michalič, 2008) and Serbia (Ministry of Trade, Tourism and Services, 2006; Vuković, Arsić, Cvijanović, 2010, Stefanovic, 2007; Čerovic, Batić, 2008) suggest that the both countries are the least competitive in its destination management. In order to address whether the destination management is the main weaknesses of Slovenian and Serbian tourism, following hypothesis were created:

H1: The first main hypothesis claims that the weakest point in Serbian and Slovenian tourism competitiveness is according to the Integrated model of destination competitiveness, destination management. Consequently, these two countries are more competitive in the attractiveness of their created, inherited and supporting resources than in their destination management.

h1: A sub-hypothesis of the first hypothesis claims that, among the resources, Inherited resources are more competitive than the Created resources and are at the same time more competitive than Supporting resources.

H2: The second main hypothesis refers to Destination management and Demand conditions, and claims that Destination management is again the weakest competitive factor.

h2: A second sub-hypothesis relates Destination management to Situational and Demand Conditions and assumes that both countries are less competitive in Destination management

than in Situational and Demand Conditions.

IV. RESEARCH METHODOLOGY

Competitiveness is both multi-dimensional (ie. what are the salient indicators of competitiveness) and a relative concept (ie. compared to what?) (Spence, Hazard, 1988). Hence, authors have to answer to two important questions before designing the research.

First important question concern which indicators authors should include in the survey instrument. In order to obtain the answer and create survey instrument, Slovenian and Serbian tourism research academics organize the workshop during 2009. A survey instrument for measuring destination competitiveness was prepared from the list of indicators identified by Dwyer, Kim (2003). The academics discussed and concluded that all of 85 indicators identified by Dwyer, Kim (2003) are appropriate for measuring destination competitiveness of Slovenia and Serbia. Then, set of 85 indicators were created in the form of 85 statements.

Second important question refers to „compare to what"? Namely, when comparing destinations, it is necessary to establish some comparison standard. In our case, it should be a destination or country, which represent direct competitor to the object of comparison (Enright, Zins, 2004). Thus, the responders were left alone to identify a destination in the region that is, in their own opinion the most competitive to their country. This was the most logical way to obtain the comparison standard. Otherwise, if the authors asked responders to compare competitive position of their own country to competitive position of a country in the region, it would implicitly assume that all responders are familiar with all destinations and their competitive set of indicators.

Serbian responders (90%) mainly considered Hungary, Croatia, Montenegro, and Slovenia to be their major competitors. Slovenian majority of responders (80.5%) consider Croatia, Austria and Italy as well as Switzerland to be the main competitive destination.

Finally, responders from both countries were asked to rate each of the 85 competitive indicators on a five-point Likert scale comparing Serbia or Slovenia to, in their opinion, the most competitive destination. The options ranged from 1 (the competitiveness level in Serbia/Slovenia is well below the same level in the competitive destination) to 5 (the competitiveness level in Serbia/Slovenia is much above the same level in the competitive destination).

The questionnaires were gathered during 2009. The researcher decided to conduct the questionnaire using non-probability sampling, in this case – convenience sample. The research sample was made out of tourism stakeholders on the supply side. Namely, eight groups of experts were defined (See Table 1. Sample characterizes, work position). Some of the questionnaires were self-directed, others were sent by mail.

The authors decided to conduct the research among experts and practitioners in the destinations and not among tourists, because tourists are capable of evaluating those components of destination attractiveness among the services they consume. However, they are less likely to know about, and hence to be able to evaluate, those factors that underlie and influence the competitive production of those services, especially because of their status as

visitors (Gomezelj, Mihalič, 2008; Enright, Newton, 2004).

The 258 questioners were obtained. From the 280 questionnaires that were sent out, 140 were returned from Serbian responders and from 291 questionnaires sent out in Slovenia, 118 were returned. The research sample is presented in Table 1.

TABLE 1— Sample Characteristics

Sample characteristics	Serbia	Slovenia
Number of responses	140	118
Work position		
Government officials	5.0%	6.8%
Tourist agency managers	22.9%	12.8%
Tourism school academics	10.7%	6.0%
Hospitality sector managers	9.3%	26.4%
Tourism service managers	7.9%	15.0%
Postgraduate students on tourism courses	29.9%	12.0%
Employers in local tourist organisations	14.3%	15.0%
Others		6%
Work experience in tourism industry		
Linked with tourism industry for less than 10 years	73.6%	63.6%
Linked with tourism industry from 11 to 20 years	13.6%	18.5%
Linked with tourism industry from 21 to 30 years	10.0%	10.2%
Linked with tourism industry more than 30 years	2.9%	7.7%
Gender		
Female	52.9%	66.1%
Male	47.1%	33.9%

SOURCE: Survey Research

The first step in the analysis was to look at some basic descriptive statistics (arithmetic means (AM), standard deviations (SD)) of these responses. These frequency distributions clearly indicate one important aspect of the answers given: Slovenian responders gave consistently higher ratings than the responders from Serbia. Then, pared sample t-test was conducted to realise is there any difference between responders from Slovenia and Serbia in perception of competitiveness of measured destination competitiveness indicators. The SPSS standard package for personal computers was used for data processing.

A. Inherited resources

Inherited (endowed) resources include both natural and cultural elements. Inherited Resource features are ranked quite differently comparing answers of Serbian and Slovenian responders. Serbian responders stated that historic sites, heritage, and traditional art are the most competitive features. Cleanness was the most incompetent indicator compared to their competitive destinations. Additionally, Serbia as a continental country has less favorable attractiveness of climate for tourism.

TABLE 2— Mean values and standard deviations (SD) for individual competitiveness indicators of inherited resources (INH)

	Serbia		**Slovenia**	
	Mean	SD	Mean	SD
Historic sites	3,657		3,211	
Heritage	3,578		3,466	
Traditional arts	3,521		3,737	
Flora and fauna	3,364		4,000	
Artistic and architec. features	3,207		3,220	
Unspoiled nature	3,014		4,406	
National parks	3,000		3,584	
Attractiveness of climate for tourism	2,735		3,839	
Cleanliness	2,107		3,669	

SOURCE: Survey Research

According to Slovenian responders, the highest rating was assigned to the unspoiled nature, flora and fauna, attractiveness of the climate and traditional arts. For Serbia the highest were rated historic sites, heritage, traditional arts and the poorest were rated cleanliness, attractiveness of climate for tourism and for Slovenia this were historic sites, artistic and architectural features.

B. Created Resources

Result of descriptive statistic indicates that whilst variety of cuisine is ranked highly in both countries (ranked third of most competitive elements in Slovenia, and second in Serbia) other features are ranked quite differently. Nightlife (bars, discos, dances), special events/festivals, food service facilities, health resorts and spa, winter based activities and diversity of shopping experience are the highly rated created resources according to the Serbian responders. On the other, health resorts, spa, visitor accessibility to natural areas, casinos, nature based activities, accommodation and food service facilities are considered as some of Slovenia's competitive features. Other features that are considered not to be competitive in Slovenia are amusement/theme parks, community support for special events and nightlife.

TABLE 3— Mean values and standard deviations (SD) for individual competitiveness indicators of created resources (CRE)

	Serbia		**Slovenia**	
	Mean	SD	Mean	SD
Nightlife	3,792	1,115	2,500	0,844
Variety of cuisine	3,692	0,936	3,813	0,739
Special events/festivals	3,214	1,037	3,067	0,792
Food service facilities	3,207	0,909	3,389	0,827
Health resorts, spa	3,142	1,244	4,271	0,747
Winter based activities	3,071	1,203	3,101	0,937
Diversity of shopping experience	3,057	0,994	3,000	0,806
Rural tourism	2,978	1,102	3,330	0,896
Entertainment	2,921	0,982	2,881	0,818
Nature based activities	2,857	1,116	3,440	0,852
Congress tourism	2,821	1,074	3,347	0,841
Community support for special event	2,807	1,072	2,398	0,868
Sport facilities	2,671	1,013	3,228	0,767
Local tourism transportation efficiency/quality	2,621	1,042	2,550	0,843
Casino	2,614	0,993	3,584	0,927
Adventure activities	2,614	1,063	3,101	0,937
Accomodation	2,607	1,050	3,406	0,808
Recreation facilities	2,474	1,030	3,339	0,786
Tourism guidance and information	2,464	0,947	3,084	0,822
Existence of tourism programs for visitors	2,364	0,797	3,084	0,863
Airport efficiency/quality	2,342	1,084	2,542	0,812
Amusement/Theme parks	2,307	1,031	2,067	0,770
Visitors accessibility to natural areas	2,278	0,873	3,923	0,858
Water based activities	1,885	1,018	2,855	0,936

SOURCE: Survey Research

Water based activities, visitor's accessibility to natural areas, amusement/theme parks according to the Serbian responders are considered the least competitive. It is very interesting that nightlife is rated as most attractive for Serbia, but third last for Slovenia.

C. Supporting factors

The ratings for the indicators of determinant Supporting factors were considerably lower than for the Inherited resources and Created resources in both countries. Some Supporting factors and resources, including the hospitality of residents towards tourists, communitation and trust between tourists and residents and telecommunication system for tourists are considered to be among the most attractive features of both countries and animation is

considered to be the least competitive. But, for Serbia only two out of the twelve supporting factors are rated as being more competitive (rated with a score greater than 3) in comparison to the chosen set of competitive destinations: hospitality and financial institutions & currency exchange facilities. Other competitive indicator values are not competitive (rated with a score less than 3).

TABLE 4— Mean values and standard deviations (SD) for individual competitiveness indicators of supporting resources (SUP)

	Serbia		**Slovania**	
	Mean	SD	Mean	SD
Hospitality of residents towards tourists	3,314	1,053	3,457	0,769
Financial institutions and currency exchange- facilities	3,171	0,913	2,957	0,841
Telecommunication system for tourists	2,992	0,835	3,262	0,919
Communitation and trust between tourists and residents	2,778	1,080	3,347	0,841
Destination links with major origin markets	2,685	0,929	2,957	0,841
Attitudes of custom/immigration officials	2,650	0,973	2,898	0,851
Quality of tourism sector	2,614	0,949	3,254	0,741
Health/medical facilities to serve tourists	2,585	0,989	2,771	0,881
Efficiency of customs/imigration	2,564	0,968	2,915	0,863
Accessibility of destination	2,550	0,947	3,313	0,854
Visa requirement as impediment to visitation	2,457	1,337	2,915	0,863
Animation	2,400	0,854	2,593	0,797

SOURCE: Survey Research

Slovenian responders have six out of the 12 supporting factors rated as more competitive in comparison to the chosen set of competitive destinations: hospitality, communication and trust between tourists and residents, accessibility of the destination, the telecommunication system for tourists, quality of tourism services and financial institutions & currency exchange facilities. Other indicator values are not competitive. In both countries, animation is considered the least competitive feature among Supporting factors.

D. Destination Management

Feature resident support for tourism development is rated highly among this grouping for both Serbia and Slovenia, whilst government co-operation in development of tourism policy and extend of foreign investment in destination tourism industry are rated relatively low in both countries.

According to the applied model, Serbia is the least competitive in all of the Integrated model destination management indicators. The highest rated was existence of adequate educational program, enterpreneurial qualities of local tourism businesses, educational structure/profile of employees in tourism and resident support for tourism development. The lowest was destination policy regarding social tourism, government co-operation in development of tourism policy and extend of foreign investment in destination tourism industry.

TABLE 5— Mean values and standard deviations (SD) for individual competitiveness indicators of destination management (MAN)

	Serbia		**Slovenia**	
	Mean	SD	Mean	SD
Appreciation of service quality importance	2,542	0,842	3,033	0,783
Destination has clear policies in social tourism	2,121	0,963	2,398	0,925
Destination vision reflecting community values	2,471	0,772	2,737	0,767
Destination vision reflecting tourists values	2,528	0,826	2,839	0,805
Destination vision reflecting resident values	2,442	0,833	2,711	0,752
Destination vision reflecting stakeholder values	2,578	1,073	2,720	0,783
Developing and promoting new tourism prodacts	2,457	0,939	2,661	0,859
Development of effective destination branding	2,350	0,920	2,593	0,879
Educational structure/profile of employees in tourism	2,671	1,883	2,728	0,735
Efficiency of tourism/hospitality firms	2,507	0,925	3,000	0,613
Enterpreneurial qualities of local tourism businesses	2,692	0,855	2,974	0,778
Existence of adequate tourism education programs	2,800	0,968	2,610	0,784
Extend of foreign investment in destination tourism industry	2,135	1,012	2,152	0,902
Government co-operation in development of tourism policy	2,192	0,920	2,339	0,898
Level of co-operation between firms	2,578	0,898	2,533	0,712
NTO reputation	2,428	1,060	2,720	0,932
Private sector commitment to tourism/hospitality education	2,450	0,875	2,508	0,884
Private sector recognition of importance of sustainable tourism divelopment	2,421	0,952	3,008	1,000
Public sector commitment to tourism/hospitality education	2,557	0,976	2,406	0,829
Public sector recognition of importance of sustainable tourism divelopment	2,421	0,914	2,389	0,795
Quality in performing tourism services	2,607	0,887	2,822	0,812
Quality of research input to tourism policy, planning, development	2,378	0,955	2,389	0,987
Resident support for tourism development	2,657	0,957	3,169	0,743
Tourism development integrated with overall industry development	2,378	0,963	2,601	0,775
Tourism/hospitality training responsive to visitors needs	2,428	0,898	3,025	0,756

SOURCE: Survey Research

According to Slovenian responders residents' support for tourism development, appreciation of the importance of service quality, tourism/hospitality training responsive to visitor needs and private sector recognition of the importance of sustainable tourism development are all highly rated. Extent of foreign investment in destination tourism industry, government co-operation in development of tourism policy and quality of research input to tourism policy, planning, development are considered to be the least competitive features.

E. Situational Conditions

Access to venture capital, co-operation between public and private sector and investment environment are all rated low among this grouping for both Serbia and Slovenia, while securety/safety of visitors is rated relatively high in both countries.

TABLE 6— Mean values and standard deviations (SD) for individual indicators of situational conditions (SIT)

	Serbia		**Slovenia**	
	Mean	SD	Mean	SD
Access to venture capital	2,242	0,863	2,593	0,839
Co-operation between public and private sector	2,328	0,790	2,355	0,842
Investment environment	2,407	0,995	2,635	0,802
Manageres capabilitie	2,692	0,928	2,949	0,825
Political stability	2,450	1,020	4,118	0,718
Securety/safety of visitors	2,864	0,938	4,169	0,765
Use of e-commerce	2,707	0,909	2,864	0,727
Use of IT by firms	2,707	1,007	3,067	0,781
Value for money in accomodation	2,750	0,898	3,398	0,848
Value for money in shopping items	3,042	0,912	3,067	0,848
Value for money in tourism destination experience	2,750	0,857	3,449	0,863

SOURCE: Survey Research

Serbia is the most competitive in terms of the value for money in accommodation, value for money in shopping items and value for money in tourism destination experience and securety/ safety of visitors. But the less competitive in the area of access to venture capital.

Slovenia is the most competitive in terms of security/ safety of visitors, political stability, value for money in destination tourism experiences, value for money in accommodation, the use of IT by firms and value for money in shopping items. Slovenia is the least competitive in the area of co-operation between public and private sector and access to venture capital.

F. Demand Conditions

Destination conditions include elements related to destination image and awareness of the existence of the destination on the tourist market. All elements of demand conditions are considered uncompetitive in both countries in Serbia as well in Slovenia.

TABLE 7— Mean values and standard deviations (SD) for individual competitiveness indicators of demand conditions (DEM)

	Serbia		Slovania	
	Mean	SD	Mean	SD
"Fit" between destination products and tourists preferences	2,471	0,843	2,703	0,695
International awareness of destination products	2,335	0,933	2,000	0,877
Overall destination image	2,278	0,952	2,830	0,899
International awareness of destination	2,235	0,956	2,152	0,695

SOURCE: Survey Research

Both, Slovenia and Serbia are considered not to be competitive in all of the Integrated model demand condition indicators. Each of these items is important for generating high and stable tourism flows in the future. In particular, both countries should make efforts to enhance overall destination image to attract visitors from foreign countries.

G. Relations Between the Main Competitiveness Determinants

In order to study the relations between the main competitiveness elements, mean values were calculated for each of the competitiveness category from the individual competitive statements in each category. The main competitiveness elements are presented in Table 8. In order to check whether there is a statistical significance among the grouped indicators for Serbia and for Slovenia separately, the analysis of pared samples t-tests was conducted.

TABLE 8— Results of competitiveness hypothesis testing: Paired Sample t-tests for Serbian and Slovenian tourism

		Serbia				Slovenia			
		Mean	SD	t	Sig. (2-tailed)	Mean	SD	t	Sig. (2-tailed)
1.	RESOURSES-MAN	0.589	0.402	17.247	0.000	0.615	0.379	17.616	0.000
1.1.	INH-MAN	0.960	0.708	16.057	0.000	0.999	0.536	20.226	0.000
1.2.	CRE-MAN	0.553	0.420	15.521	0.000	0.456	0.396	12.493	0.000
1.3.	SUP-MAN	0.255	0.437	6.911	0.000	0.390	0.438	9.672	0.000
1.4.	INH-CRE	0.405	0.705	6.773	0.000	0.543	0.460	12.815	0.000
1.5.	INH-SUP	0.705	0.688	12.121	0.000	0.608	0.541	12.201	0.000
2.	CONDITIONS-MAN								
2.1.	SIT-MAN	0.156	0.363	5.083	0.000	0.468	0.331	15.368	0.000
2.2.	DEM-MAN	-0.144	0.489	-3.496	0.001	-0.261	0.469	-6.054	0.000

SOURCE: Survey Research

According to Serbian tourism experts, Serbia is more competitive in its Resources than in Destination Management (t=16.057; sig.=0.000), especially when its natural resources are concerned (INH). Additionally, a sub-hypothesis of the first hypothesis was statistically proven: among resources, Inherited resources are more competitive than the Created resources and are at the same time by far more competitive than Supporting resources.

Regarding the second hypothesis, Situational conditions in the destination are considered by travel experts more competitive than Destination management, and this was also statistically proved (t= 5.083; sig.= 0.000).

However, comparing Demand conditions and Destination management, it turned out that Demand conditions are less competitive than Destination management (t=-3.496; sig.=0.001). Consequently, it can be concluded that Demand conditions are the weakest part of Serbian competitiveness. This means that Demand conditions that refer to the awareness and image of one destination, have to be improved in order to raise tourism industry competitiveness.

According to Slovenian tourism experts, Slovenia is more competitive in its Resources, especially in its natural resources and less competitive in its Destination management efforts. Regarding the second hypothesis, it had been expected that Situational conditions more strongly support Slovenian tourism's competitiveness than Destination management and this was statistically proved (t=15.368; sig.=0.000). Nevertheless, Destination management turned out to be the stronger competitiveness category in the pair with Demand conditions (t=-6.054; sig.= 0.000). Thus, Demand conditions are the weakest part of Slovenian competitiveness as well as in the case of Serbia.

Comparing the results of t-tests, the results are almost the same for Slovenia and Serbia. However, Serbian responders perceived inherited resources (t=16.057; sig.=0.000) as the most competitive, and Slovenian responders perceived as the most competitive, situational conditions (t= 20.226; sig.=0.000).

V. DISCUSSION

The fundamental task of the destination management is to understand how tourism destination competitiveness can be enhanced and sustained. Therefore, it is of the utmost importance for the destination to realize its real competitive position and its competitive advantages and disadvantages. However, there is no unique way to measure competiveness of different destinations. Researchers argue that no universal and optimal competitiveness model exists for every destination. Nevertheless, an existing tourism competitiveness model developed for a competitiveness study in Australia and Korea was used to evaluate the competitiveness of Slovenian and Serbian tourism. The model and its questionnaire in particular proved to be useful for the Serbian and Slovenian study.

The comparison of basic indicators led to the following results: the results showed that Slovenia is, compared to its competitors, more competitive in its inherited and in some of its created resources: natural endowments, cultural heritage, and spas. Similarly to Slovenia, research showed that Serbia is also considered to be more competitive in its Inherited and

some of its Created resources: natural endowments and nightlife. In addition to the nightlife, variety of cuisine and special events are most competitive features.

The research also reveals areas where improvements should be made to boost Slovenian as well as Serbian tourism competitiveness and where tourism managers should add value in order to improve competitive position of their countries. Competitive strategy should be aimed at increasing the competitiveness of the weakest elements of Serbian tourism, which are, as research shows, demand conditions and destination management. According to the Integrated model (Dweyer & Kim, 2003a) demand conditions consist of destination image and the existence of the awareness of the destination. Therefore, we believe that competitive position of Serbia could be improved by stronger promotional activities on the international market and profiling the image of Serbia as a tourist destination.

As far as Slovenia is concerned, destination attractiveness can be increased by appropriate and stronger quality managerial efforts and can be enhanced through marketing activities. Tourism promotion should boost the awareness of Slovenia as a destination in tourism markets.

Given that demand conditions and especially images of both destinations are the least competitive elements of the Integral model of competitiveness, it can be concluded that the political and war related events during the 1990s left long-term consequences (Clements & Georgiou, 1998). We certainly believe that, after two decades, the problem of underdeveloped destination image cannot be attributed to the previous events, but to the inadequate and non-competitive destination management. However, the durability of image should be also considered, which according to Kotler and Keller (2006) is explained by the fact that when people form a certain image of an object, each additional observation is selective. Therefore, it is necessary to make big marketing efforts to build desired destination image.

This means that Serbia, as well as Slovenia, has the opportunity to become a successful tourism destination but for the efficient prosperity of the tourism industries, many improvements in the area of destination management and demand conditions (most probably promotion) should be made, especially in the field of regional appeal.

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KONKURENTNOST TURISTIČKE DESTINACIJE – IZMEĐU DVIJU ZASTAVA

SAŽETAK

Cilj rada je ponuditi bolje razumijevanje konkurentnosti destinacije i elemenata koji utječu na konkurentnu poziciju turističke destinacije. Istraživanje je osmišljeno kao komparativna studija Slovenije i Srbije. Za analizu konkurentnosti spomenutih destinacija korišten je integrirani model konkurentnosti destinacije. Rezultati su pokazali da se obje destinacije smatraju konkurentnijima u njihovim prirodnim, kulturnim i stvorenim resursima, dok su znatno manje konkurentne po menadžmentu destinacije i, sudeći po integriranom modelu, po uvjetima potražnje. Na osnovu ovih nalaza, daju se relevantni prijedlozi kako bi se poboljšale konkurentne pozicije destinacija.

Ključne riječi: *konkurentnost destinacije, model konkurentnosti, turizam, Slovenija, Srbija*

RELATIONSHIP COMMITMENT, RELATIONAL EQUITY AND COMPANY IMAGE IN CUSTOMER LOYALTY DEVELOPMENT[1]

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ABSTRACT

This paper explores the relationship between customer loyalty and its seldom researched antecedents: relationship commitment, relational equity and company image. The proposed conceptual model is tested with data gained from customers of mobile telephone operators. The results show that relationship commitment and relational equity have a statistically significant positive influence on customer loyalty. In addition, the results of hierarchical multiple regression analysis reveal that the number of different mobile operators a person uses is not related to customer loyalty when relationship commitment, relational equity and company image are included in the model. Drawing on the results, the paper offers implications for managing customer loyalty.

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I. INTRODUCTION

Researchers agree that loyal customers are important for companies in today's competitive world. Loyal customers are defined as repeat buyers or users of a company's products/services (Ngobo, 1999), who exclusively buy company products/services/brands, as well as buy across a company's product/service assortment, and show higher price tolerance (Hill and Alexander, 2003). When companies try to develop customer loyalty, they put customers in the centre of their business. As an outcome, company profit is augmented (Reichheld and Sasser, 1990). Companies that are customer-centred, collect information about customers to understand them and their reactions and act upon this collected information (Shieffer and Leininger, 2008). This has to be done with the aim of improving company business and creating sustainable profitability.

Researchers explore different elements that could contribute to customer loyalty development. Customer satisfaction is predominantly emphasized as the most important element of customer loyalty creation (e.g. Fornell, 1992, Oliver, 1980). It is an element that is a prerequisite for loyalty. Hence, a company that constantly delights customers (i.e. constantly creates their satisfaction) will have more loyal customers. The same applies to service/product quality: customers will do more business and more often with a company that delivers quality products/services, leading to customer loyalty (e.g. Bloemer, de Ruyter and Peeters, 1998, Zeithaml, Berry and Parasuraman, 1996). In addition to the above, customers also establish trust in a company and its products/services (e.g. Chiou and Droge, 2006, Johnson and Auh, 1998). As trust is created, customers feel more confident, have reduced risk or know what to expect from a company. Hence, customer loyalty is enhanced. Customers also develop commitment towards a company (e.g. Fullerton, 2003, Jones, Reynolds, Mothersbaugh and Beatty, 2007). When customers feel committed, they will stay longer with a company and, consequently, customer loyalty is enhanced. These antecedents are found to be the most researched antecedents in customer loyalty literature. Other influences have received only minor attention.

Companies have to be creative in keeping their customers and in creating their loyalty. This is possible by establishing relationships with customers. Relationships are established when products/services are beneficial for a customer and when other existing alternatives are not attractive (Hennig-Thurau, Gwinner and Gremler, 2000). So, it is all about how customers perceive they are receiving value from a certain company. Companies that have customer-centred vision and strategy (Goodwin and Ball, 1999) can constantly create value for customers; for superior value creation they have to establish relationships with customers. A company can effectively manage relationships by adopting a systematic approach to relationship development. This approach includes identifying the best customers, developing strategies for acquiring and retaining them, as well as making efforts in cultivating and managing relationships (Slater, Mohr and Sengupta, 2009). While these constructs are more extensively defined in the conceptual background presented in the following chapter, we need to justify the selection of the focus of this article early on with an elaboration of the selected constructs.

In long-term relationships, constant value delivery is an element that stimulates customer relationship commitment. Relationship commitment is defined as psychological attachment to, as well as identification with, the company/relationship (Aurier and N'Goala, 2010, Garbarino and Johnson, 1999, Morgan and Hunt, 1994).

In a relationship, when customers are giving up something (alternatives), they expect to gain something in return (Peterson, 1995). Relationship equity is defined as the cost-benefit ratio in a relationship that has to be equitable for customers to continue doing business with a company (Olsen and Johnson, 2003, Raimondo, Miceli and Costabile, 2008). The perception of relationship equity is important for nurturing relationship commitment and is one of the key drivers of growth and profitability (Sawhney and Zabin, 2002).

Additionally, companies try to establish relationships with customers by emphasizing company image. Image is the perception of company/product/service/brand in a customer's mind (Nguyen and Leblanc, 2001). By promoting an image tailored to target customers, companies attract potential customers. Image helps a company to reinforce the appropriateness of a customer's decision in choosing the company, and it helps to differentiate the company from competitors. Positively perceived company image is related to loyalty to the company (Andreassen and Lindestad, 1998, Aydin and Özer, 2005).

Relationship commitment, relational equity and company image have received little attention in the literature, although they are seen as important antecedents to customer loyalty. Researching the aforementioned neglected antecedents will help us to understand the opportunities of enhancing customer loyalty with elements that are usually overlooked.

The main purpose of this paper is to obtain insight into the nature of the relationship between customer loyalty and relationship commitment, relational equity and company image. This research aims to provide more information about how to manage customer loyalty based on its antecedents. A conceptual model is proposed and tested on data about mobile operator users.

II. Conceptual background and conceptual model

A. Relationship commitment

Customer care is important in today's business when companies are reconsidering their long-term success. In order to take care of customers, companies establish and nurture relationships with them. These relationships are enhanced and have a good predisposition to become long-term when companies incorporate customers in a joint value-creation process (Heskett, Jones, Loveman, Sasser and Schlesinger, 1994). As a consequence, personal and social bonds (Hennig-Thurau, 2000), which are long-term relationship prerequisites, are strengthened. In addition, commitment is an important element of all successful long-term relationships (Garbarino and Johnson, 1999).

Commitment is seen as an enduring desire to maintain a relationship (Moorman, Zaltman

and Deshpande, 1992). This long-term objective is amplified in relationships that establish intensive and direct contact with relationship partners and involve partners in a dialogue (Diller, 2000). As a result, a long-term relationship is developed. In this process, it is well acknowledged that commitment is an important element (Fullerton, 2003, Hennig-Thurau, Gwinner and Gremler, 2002), and it has been thoroughly explored from a variety of standpoints. Relationship commitment, however, has not received as much attention (Garbarino and Johnson, 1999, Morgan and Hunt, 1994, Lacey and Morgan, 2007, Sharma and Patterson, 2000). Mostly, it has been conceptualized as a desire to continue and a willingness to maintain a relationship (Morgan and Hunt, 1994, Lacey and Morgan, 2007).

Relationship commitment provides for the creation and preservation of relationships among marketplace actors (Lacey and Morgan, 2007). Value perception is vital for continuing a relationship. A relationship that is perceived as valuable to a customer is a candidate for becoming long-term. Simply said, a customer cares about a relationship that offers value (Lacey, Suh and Morgan, 2007). Over time, a customer and a provider develop a very special connection in which they feel attached and, sometimes, they feel they are like a part of a family. All this shapes customers' commitment to the relationship. Hence, positive value perception is a prerequisite for relationship continuance (Moorman, Zaltman and Deshpande, 1992), and it creates customer loyalty (Oliva, Oliver and MacMillan, 1992, Hennig-Thurau, Gwinner and Gremler, 2002, Fullerton, 2003). Based on the literature research, the following hypothesis is formed: *H1. Relationship commitment is positively related to customer loyalty.*

B. Relational equity

Besides a sense of commitment that is an essential ingredient of long-term relationships, customers also expect a fair distribution of costs and benefits among partners in relationships. Customers mentally evaluate if benefits in relationships are fairly distributed among partners (Raimondo, Miceli and Costabile, 2008). This comparison provides customers with a sense of equity in a relationship and enhances the customer's feeling of fair treatment (Kim and Ok, 2009). Therefore, relational equity is a customer's perception of the proportionality between her or his own and a provider's cost-benefit ratio within a continuous relationship (Raimondo, Miceli and Costabile, 2008). Hence, it assumes fairness of cost-benefit distribution in a relationship.

This fairness is a subjective customer evaluation based on individual perception (Oliver and Swan, 1989). Even so, it is important that customers involved in a long-term relationship feel they are fairly treated. Therefore, parties in a relationship will feel equitably treated, and consequently satisfied, if the ratio of their outcomes to inputs is, in some sense, fair (Oliver and DeSarbo, 1988). In relationships that are characterized as equitable, customers stay longer, and customer loyalty is developed (Olsen and Johnson, 2003, Raimondo, Miceli and Costabile, 2008). Therefore: *H2. Relational equity is positively related to customer loyalty.*

C. Company image

Company image differs among customers. It is a subjective category based on previous consumption experiences. These experiences influence the overall impression about a company and its services/products and brands (Nguyen and Leblanc, 2001). They consequently form company image (Dichter, 1985, p.75 in Dowling, 1988). Building image is a lengthy and

extensive process. But a company that has a credible (Chitty, Ward and Chua, 2007), as well as positive, image (Lai, Griffin and Babin, 2009) is perceived to provide more value for customers. As noticed before, value perception is important in the customer decision process.

Furthermore, excellent customer service provided by a company, as well as reliability in providing products/services, help to augment company image (Türkyilmaz and Özkan, 2007). A company that is forward looking, anticipates trends and provides innovative products/services also provides more value for customers. Therefore, this kind of company will have a positive company image among customers (Bloemer, deRuyter, Peeters, 1998). As a consequence, a favourable image leads to increasing repeat patronage, as well as customer loyalty (Dick and Basu, 1994, Andreassen and Lindestad, 1998, Johnson, Gustafsson, Andreassen, Lervik and Cha, 2001, Nguyen and Leblanc, 2001). From the literature it follows that: *H3. Company image is positively related to customer loyalty.*

D. Customer loyalty

Contemporary companies opt for high customer loyalty, because they have realized that there are several positive consequences emerging from having a loyal customer base. As Diller (2000) asserted, it brings more security to a company, as well as to company and profitability growth. To have positive effects from customer loyalty, a company has to take care of its customers. Customer loyalty is created by developing and intensifying relationships with customers, as well as by retaining customers by providing satisfaction and increasing switching barriers (Fornell, 1992, Meyer and Blümelhuber, 2000). To achieve this goal, a company has to implement customer retention management (Brink, 2004).

Customer loyalty is considered a deeply held commitment to rebuy or repatronize a preferred product/service consistently in the future, despite situational influences and marketing efforts having the potential to cause switching behaviour (Oliver, 1997 in Oliver, 1999, p. 34). Different authors conceptualize customer loyalty as a single concept (Andreassen and Lindestad, 1998, Bloemer, deRuyter and Peeters, 1998, Fornell, 1992, Johnson, Garbarino and Sivadas, 2006) or multidimensional construct (DeWitt, Nuguyen and Marshall, 2008, Dick and Basu, 1994, Jones and Taylor, 2007, Oliver, 1999). In researching the different dimensions of customer loyalty, the attitudinal and behavioural components are predominantly explored. But some researchers add a third dimension indicated as cognitive loyalty (Bloemer, de Ruyter and Wetzels, 1999, Jones and Taylor, 2007), while others (Rundle-Thiele, 2005) include even a fourth and a fifth customer-loyalty dimension to their research. This research will consider customer loyalty as a three-dimensional construct consisting of attitudinal, behavioural and cognitive loyalty.

Attitudinal loyalty expresses attitude towards a product/service. This attitudinal loyalty has roots in its conceptualization as part of a commitment to a product/service/brand (Garbarino and Johnson, 1999) or commitment to creating value for customers (Reichheld, 2001). It is operationalized as a favourable attitude towards a product/service/brand/customer (Dick and Basu, 1994): customers consider themselves to be loyal (Leverin and Liljander, 2006) or they are dedicated to do business with a service provider (Dewitt, Nuguyen and Marshall, 2008). Customers with high attitudinal loyalty feel proud to use products/services (Johnson, Garbarino and Svidas, 2006). Also, they experience a sense of strong relationship with a

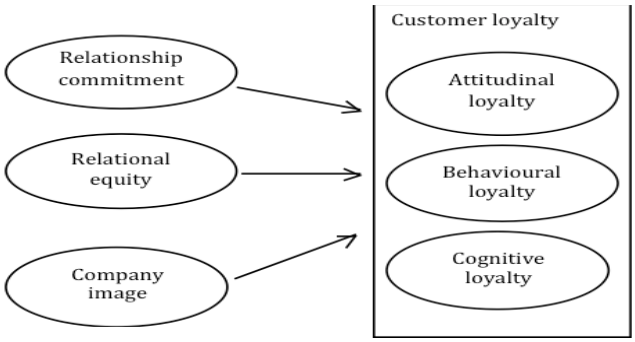
service provider (Hennig-Thurau, Gwinner and Gremler, 2002). As a consequence, a positive attitude is established, and customer loyalty is experienced.

Repeat patronage is the core of the behavioural dimension of customer loyalty. It incorporates the intention to use a service provider in the future (Aydin and Özer, 2005) and a lack of considering service-provider change (Leverin and Liljander, 2006). This is based on the belief that the current service provider offers more benefits than competitors (Li and Petrick, 2008) do, which results in preference, as well as exclusive consideration of a service provider, when buying a new product/service (Zeithaml, Berry and Parasuraman, 1996, Aydin and Özer, 2005). In addition, customers want to use a larger number of different services from their current service provider (Sublaban and Aranha, 2009).

Customer loyalty is also characterized as cognitive loyalty (Bloemer, de Ruyter and Wetzels, 1999). It is conceptualized as a brand preference among other available alternatives, or preference based on brand beliefs (Oliver, 1999), conscious brand-attributes evaluation or conscious evaluation of rewards and benefits associated with repatronage (Lee and Cunningham, 2001 in Jones and Taylor, 2007). Cognitive loyalty is often operationalized as top of the mind product/service, customers' first choice, price tolerance, exclusive consideration and identification (Bloemer, de Ruyter and Wetzels, 1999, Jones and Taylor, 2007). We operationalize it as price insensitivity: loyal customers would continue to do business with a service provider even if it increases its prices (Dewitt, Nuguyen and Marshall, 2008). On the other hand, loyal customers would continue to do business with a company in spite of competitors' better of discounted prices (Dewitt et al., 2008). So we can say that loyal customers are prepared to pay higher prices for benefits they receive (Han, Kwortnik and Wang, 2008), and that price is not an important factor in their decision to continue doing business with their provider (Jones and Taylor, 2007).

Building strong relationships is more than a necessity in a company that is customer oriented. In a competitive world where customers have multiple choices and can easily switch, it is important for a company to create and develop relationships with them. As customer loyalty in its core represents buying products from one company, it is supposed that if customers use a certain service from different service providers, they are demonstrating a non-loyalty pattern. Therefore: *H4. The number of service providers a person uses is negatively related to customer loyalty.*

The following conceptual model is proposed:



SOURCE: Author

III. RESEARCH METHODOLOGY

A. Operationalization of the variables

For the operationalization of variables, several scales from the literature were considered. For relationship commitment, insights from Morgan and Hunt (1994), as well as from Lacey, Suh and Morgan (2007), were used. When discussing commitment, it is important to note that it includes a desire to continue, and a willingness to maintain, a relationship (Morgan and Hunt, 1994, Lacey and Morgan, 2007). In relational equity operationalization, the main emphasis is on a subjective evaluation of personal fairness perception in a certain relationship (Oliver and Swan, 1989). Also different elements related to relational equity were included, based on the research of Kim and Ok (2009), as well as Raimondo, Miceli and Costabile (2008). Image operationalization was done based on the work of Nguyen and Leblanc (2001), Türkyilmaz and Özkan (2007) and Aydin and Oezer (2005). Thereby, image is represented as a customer's overall impression about a company, its services/products and its brands based on previous consumption experiences (Nguyen and Leblanc, 2001).

Customer loyalty operationalization is grounded in Oliver's (1997 in Oliver, 1999, p. 34) conceptualization, i.e. it is considered a deeply held commitment to rebuy or repatronize a preferred product/service consistently in the future, despite situational influences and marketing efforts having the potential to cause switching behaviour. However, some authors approach customer loyalty as consisting of several dimensions. Mostly researched are the attitudinal and behavioural dimensions of customer loyalty (Chiou and Droge, 2006, Dewitt, Nuguyen and Marshall, 2008, Li and Petrick, 2008, Leverin and Liljander, 2006, Raimondo, Miceli and Costabile, 2008). This conceptualization is mainly based on the seminal work of Dick and Basu (1994). Sometimes researchers add a third dimension of customer loyalty, denoted as cognitive loyalty (Jones and Taylor, 2007, Rundle-Thiele, 2005). Additionally, research by Aydin and Özer (2005), Johnson, Garbarino and Sivadas (2006), Zeithaml, Berry and Parasuraman (1996) was also considered in operationalizing customer loyalty as a multidimensional construct.

B. Research instrument

The research instrument consisted of three parts. The first part included questions concerning the research interest. Questions regarding relationship commitment, relational equity, and company image, as well as customer loyalty, were included. These questions comprised 7-point Likert scale statements anchored in 1= completely disagree and 7= completely agree. In the second part, some general questions about mobile operator usage were asked, and the third part included questions about respondents' demographical characteristics.

To pre-test the research instrument, a pilot research was conducted. The research instrument was tested on 114 university students. After the pilot research, a few constructs were deleted due to low item-to-total correlation below 0, or to non-significant loading lower than 0.3 or 0.4 (Hair, Black, Babin, Anderson and Tatham, 2005). Purified constructs were then used in the main research.

For the main study, a snowball sampling method was applied on the initial sampling frame

of the student population at the Faculty of Economics of Rijeka. Each respondent was asked to forward an e-mail containing the survey link to friends and relatives. Although a non-probability sample was used to collect data, the final respondents' structure is more dispersed as the result of snowballing. Research data were gathered using an Internet survey.

IV. DATA ANALYSIS

A. Sample

The final sample consisted of 923 respondents, users of different mobile operators in Croatia. The following profile illustrates the demographic characteristics of respondents obtained from empirical research. Respondents are mostly female (78%), have an average household income (83.2%), live in a four-person household (44.1%), have finished high school (45.9%), are students (70%), belong to the 19-21 age group (44.9%), live in Central Croatia (34.4%), and live in a city with more than 75000 inhabitants (21.5%). Additional insight to the sample is given by their mobile operator's characteristics: the primary (most frequently used) mobile operator is T-Mobile (47.3%), respondents have been using it for more than 10 years (25.1%), and spend from 101 – 200 HRK per month on mobile services (38.6%).

B. Research results

To determine the underlying structure among variables in the research, exploratory factor analysis was conducted. Hence, common factor analysis with oblimin rotation and Kaiser Normalization was used. After analysis was performed, the KMO measure of sampling adequacy was at an acceptable level (above 0.7), and the Bartlett test of sphericity was significant. Analysis exposed three underlying factors, which responded to previous literature specification. Results of the exploratory factor analysis, as well as the results of construct reliability testing, are presented in Table 1.

TABLE 1—Factor and reliability analysis with construct descriptives

Items	RELATIONSHIP COMMITMENT	RELATIONAL EQUITY	COMPANY IMAGE	COMMUNALITY
Relationship is something that I really care about	0.967			0.838
Relationship is very important to me	0.889			0.792
Relationship is worth my effort to maintain it	0.851			0.808
Relationship is strong – I am very committed to continuing it	0.542			0.651
Benefits received from a relationship are fair relative to provider's costs		0.920		0.813
Fair distribution of benefits from our relationship		0.858		0.793
The services have more value than expenses		0.843		0.654
I have been treated more than fairly		0.714		0.699
The deal is fair		0.633		0.691
Innovative and forward looking			0.877	0.658
Reliable mobile operator			0.742	0.600
Environmental consciousness			0.717	0.573
Offering excellent customer service			0.652	0.683
Good image in customer mind			0.636	0.519
% explained variance	8.966	56.335	10.601	
Eigenvalues	1.255	7.887	1.484	
N	922	921	922	
Mean	4.109	3.827	5.025	
Cronbach alpha	0.922	0.924	0.879	

Note: Rotation converged in 7 iterations.

SOURCE: Author

Furthermore, explorative factor analysis of the underlying dimensions of the customer loyalty scale was also conducted. Common factor analysis with oblimin rotation and Kaiser Normalization was used. Testing of the preconditions: the KMO measure of sampling adequacy and the Bartlett test of sphericity revealed that they are above the accepted level and significant, respectively. The selection of factors was done following the scree plot criterion and theoretical background, which pointed out the existence of three dimensions in the customer loyalty scale. So, despite the eigenvalue of the third factor being below 1, it was decided to retain the factor for further analysis. Results of the exploratory factor analysis, as well as results of construct reliability testing, are presented in Table 2.

TABLE 2—Factor and reliability analysis results with descriptives and correlations among customer loyalty dimensions

Items	ATTITUDINAL LOYALTY	BEHAVIOURAL LOYALTY	COGNITIVE LOYALTY	COMMUNALITY
I consider myself to be dedicated to doing business with service provider	0.974			0.838
I consider myself to be a loyal customer	0.797			0.634
I have a very strong relationship	0.745			0.721
I am proud to use	0.678			0.644
If I bought a new mobile telephone line, I would prefer MMO		-0.932		0.749
Service provider is my first choice when buying services		-0.746		0.674
I will go on using service provider		-0.714		0.613
I believe MMO provides more benefits than other mobile operators		-0.549		0.538
Price is not an important factor in my decision to remain			0.864	0.639
If prices rise, I would continue to be a customer			0.791	0.712
Willing to pay more for provider's services			0.654	0.565
If a competing firm were to offer better prices or a discount on mobile services, I would switch. (R)			0.556	0.355
% explained variance	52.542	7.565	12.430	
Eigenvalues	6.305	0.908	1.492	
N	921	919	919	
Mean	4.312	4.504	3.082	
Cronbach alpha	0.903	0.871	0.827	
Attitudinal loyalty	1			
Behavioural loyalty	0.699**	1		
Cognitive loyalty	0.496**	0.546**	1	

*Note: Rotation converged in 7 iterations. ** p<0.01*

SOURCE: Author

From the exploratory factor analysis, it is evident that customer loyalty could be operationalized as a three-factor dimension. It consists of attitudinal, behavioural and cognitive loyalty.

Hierarchical multiple regression was applied to test the hypothesis that relationship commitment, relational equity and company image are positively related to customer loyalty. Customers can use different mobile operators. Therefore, the relationship between the number of different mobile operators (service providers) a person has and customer loyalty is also researched. The number of operators is used as a control variable and entered into Model 1. Relational equity was added to Model 2; relationship commitment, to Model 3; and company image, to Model 4. All entered variables, with the exception of the number of mobile operators, are composed as the average index of items that constitute the construct. Analysis results are presented in the Table 3.

TABLE 3—Results of hierarchical multiple regression analysis

	MODEL 1			MODEL 2			MODEL 3			MODEL 4		
	B	BETA	T-VALUE	B	BETA	T-VALUE	B	BETA	T-VALUE	B	BETA	T-VALUE
CONSTANT	4.843*** (0.114)		42.528	2.039*** (0.134)		15.162	1.558*** (0.134)		11.630	1.165*** (0.172)		6.775
NO. OF MOBILE OPERATORS[A]	-0.262*** (0.081)	-0.106	-3.228	-0.100 (0.061)	-0.041	-1.646	-0.087 (0.057)	-0.035	-1.514	-0.075 (0.057)	-0.030	-1.311
RELATIONAL EQUITY[B]				0.677*** (0.025)	0.664	26.927	0.459*** (0.031)	0.450	14.821	0.413*** (0.033)	0.405	12.430
RELATIONSHIP COMMITMENT[B]							0.316*** (0.029)	0.331	10.928	0.279*** (0.030)	0.293	9.167
COMPANY IMAGE[B]										0.140*** (0.039)	0.113	3.616
R^2		0.011			0.448			0.512			0.519	
R^2 (ADJ)		0.010			0.447			0.511			0.517	
R^2 (CHANGE)		0.011			0.437			0.064			0.007	
F		10.420***			371.868***			319.804***			246.289***	
EFFECT SIZE					0.791667			0.131148			0.014553	
POWER					1			1			0.957251	

*Notes: N=918, *** p<0.001, Standard errors are given in parenthesis. Method of including independent variables: [a] -enter method, [b]- stepwise method*

SOURCE: Author

Table 3 shows that, when we added relational equity to the model (Model 2), R^2 increased by 43.7 percentage points. By adding relationship commitment (Model 3), R^2 increased by around 6 percentage points, and when adding company image to the model (Model 4), R^2 changed below 1 percentage point. All F-values are statistically significant at 0.1% level. From the hierarchical multiple regression analysis, we can conclude that relationship commitment, relational equity and image are positively related to customer loyalty conceptualized as a three-dimensional construct. Notably, relational equity (β=0.405) contributes the most to customer loyalty, followed by relationship commitment (β=0.293), while company image (β=0.113) has the lowest contribution to customer loyalty. The number of mobile operators a person has is negatively related to customer loyalty. But, when other independent variables are entered into the regression, this relationship becomes statistically non-significant.

Assumptions of random errors and homoscedasticity have been met. This is also true for the assumption of the normality of residuals, because the graph shows a normal distribution pattern. Tolerance and VIF are at an acceptable level. The highest VIF was 2.02, and the lowest tolerance, 0.495. Average VIF is 1.704; therefore, we can conclude that collinearity is not a problem, since average VIF is not substantially larger than 1. The Durbin-Watson test showed a value of 2.019; therefore, residuals are uncorrelated. It is reasonable to expect that 5% of the residuals be outside +-2 standardized residuals. For our model, this would mean that 46 cases could satisfy this criterion. The data checking reveals that our sample has no cases

outside the mentioned acceptable area for residuals. In addition, 16 cases are more than +-2.5 standardized residuals away, meaning that the level of error is less than 1% within our model, implicating that the model is acceptable. Furthermore, none of the cases has a Cook distance larger than 1.

The average leverage value should fall below 0.004 or 0.008 for the Koallin-Welsch criterion, or 0.012 using the Stevens criterion. In our sample, we have 16 cases that fall outside the stringent average leverage value of 0.004, but only two cases that exceed the criterion of 0.012. This will not necessarily have a large influence on regression coefficients, because they are measured at the outcome. When exploring the Mahalanobis distance, it can be noticed that, in the sample, there is one case over 25, the cut-off point for large samples (Barnett and Lewis, 1978 in Field, 2009). All standardized DFBetas have values below 1, therefore no cases will have any influence over the regression parameters. Furthermore, the covariance ratio for 12 cases lies outside the upper or lower boundaries, implicating that they influence the variance of the regression parameter. According to Stevens (2002 in Field, 2009), even in the case of significant outlier with a Cook parameter below 1, there is no need to delete this outlier because it does not have a great effect on the regression analysis. As all Cook parameters are below 1, there is no need to delete these cases. Missing values were not treated separately since 6 items that contained missing values were excluded from the analysis.

To ensure the validation of the results, a split sample procedure was applied. Following Field's (2009) suggestion, the sample was separated into two randomly split subsamples. One subsample comprised 80% of the cases, and the other, the rest of the sample, i.e. 20% of the total sample. This is consistent with Picard and Cook (1984), as well as with Stecker and Vanhonacker (1993), who suggest that other procedures than a 50:50 split sample are possible. They also suggest one-quarter, as well as one-third, randomly split subsamples for validating purposes. Results are presented in the Tables 4 and 5.

TABLE 4—Results of the hierarchical multiple regression analysis accounting for 80% of the initial sample

	Model 1			Model 2			Model 3			Model 4		
	B	beta	t-value	B	beta	t-value	B	beta	t-value	B	beta	t-value
Constant	4.827*** (0.126)		38.281	2.049*** (0.149)		13.789	1.566*** (0.134)		10.551	1.319*** (0.192)		6.851
No. of mobile operators[a]	-0.253** (0.089)	-0.106	-2.854	-0.098 (0.066)	-0.041	-1.474	-0.091 (0.062)	-0.038	-1.455	-0.084 (0.062)	-0.035	-1.343
Relational equity[b]				0.675*** (0.028)	0.667	24.115	0.465*** (0.034)	0.460	13.639	0.436*** (0.037)	0.431	11.768
Relationship commitment[b]							0.309*** (0.032)	0.326		0.287*** (0.034)	0.303	8.520
Company image[b]										0.088** (0.044)	0.071	2.014
R^2	0.011			0.452			0.516			0.518		
R^2 (adj)	0.010			0.451			0.514			0.516		
R^2 (change)	0.011			0.441			0.063			0.003		
F	8.143**			298.099***			255.810***			193.684***		
Effect size				0.804745			0.132231			0.004149		
Power				1			1			0.970128		

*Notes: N=725, **p<0.05, ***p<0.001, Standard errors are given in parenthesis. Method of including independent variables: [a] –enter method, [b]- stepwise method*
SOURCE: Author

Analysis of the 80% of the initial sample reveals the same pattern of relationships as in the total sample. When relational equity is added to the model (Model 2), R^2 increases by 44 percentage points. The further addition of relationship commitment (Model 3) and company image (Model 4) has increased R^2 by 6 percentage points and less than 1 percentage point, respectively. All F-values are statistically significant at 0.1% level. We can note that relational equity (β=0.431) has more influence on customer loyalty formation than relationship commitment (β=0.303) and company image (β=0.071). Also, in comparison with the total sample, it can be noticed that relational equity, as well as relationship commitment, have higher values to a small extent, and that company image has even lower influence on customer loyalty. The number of mobile operators a person uses has approximately the same value as before, and it still has a statistically non-significant relationship with customer loyalty.

This subsample also met assumptions of random errors and homoscedasticity, as well as the assumption of the normality of residuals. VIF (highest value is 2.001) and the tolerance (lowest value 0.500) were at acceptable levels. The Durbin-Watson test was 2.043. Therefore, no residuals are correlated. It is expected for 5% of the residuals to fall outside +-2 standardized residuals, i.e. 36 cases. In this model, we have less than 5% of the cases outside the mentioned borders of +-2 standardized residuals. Moreover, 12 cases fall outside +-2.5 standardized residuals. This has implications for the model because 1.5% of the standardized residuals fall

outside the limit. But as this is no great value, it can be concluded that the sample conforms fairly accurately the model.

All Cook distances are below the acceptable cut-off of 1. Hence, the highest value is 0.0184. In our 80% sample, 19 of the cases fall outside the most stringent average leverage value criterion of 0.004. Two cases fall outside of even the Koalling-Welsch criterion of 0.012. But this will not necessarily have a large influence on regression coefficients because they are measured at the outcome. The highest value of the Mahalanobis parameter is 26, and it is on the border of the cut-off point for large samples. All standardized DFBetas are values below 1, therefore no cases will have any influence over the regression parameters. For covariance ratio, the situation is slightly different. Eight of the cases fall below the CVR criteria, therefore we can conclude that deleting the cases could improve the precision of some model parameters, but as the Cook distance is below 1, it is not necessary to exclude these cases from the analysis.

TABLE 5—Results of the hierarchical multiple regression analysis accounting for 20% of the initial sample

	MODEL 1			MODEL 2			MODEL 3		
	B	BETA	T-VALUE	B	BETA	T-VALUE	B	BETA	T-VALUE
CONSTANT	4.526*** (0.223)		20.339	1.736*** (0.251)		6.923	1.346*** (0.245)		5.482
NO. OF MOBILE OPERATORS[A]	-0.445** (0.153)	-0.205	-2.907	-0.160 (0.190)	-0.74	-1.471	-0.155 (0.102)	-0.071	-1.522
RELATIONSHIP COMMITMENT[B]				0.593*** (0.042)	0.713	14.205	0.393*** (0.054)	0.473	7.285
RELATIONAL EQUITY[B]							0.313*** (0.058)	0.345	5.353
COMPANY IMAGE[B]									
R^2		0.042			0.533			0.594	
R^2 (ADJ)		0.037			0.528			0.587	
R^2 (CHANGE)		0.042			0.491			0.061	
F		8.448**			109.517***			93.076***	
EFFECT SIZE					1.051392			0.150246	
POWER					1			1	

*Notes: N=196, **p<0.05, ***p<0.001, Standard errors are given in parenthesis. Method of including independent variables: [a] – enter method, [b]- stepwise method*

SOURCE: Author

In the 20% subsample analysis, results are different from those in the 80% subsample. Upon entering relationship commitment into the model (Model 2), R^2 increased by 49 percentage points. Upon adding relational equity into Model 3, it can be noticed that the R^2 value has changed only by 6 percentage points. All F-values are statistically significant at 0.1% level. In addition, relational equity has a smaller influence (β=0.345) on customer loyalty than relationship commitment (β=0.473). Hence, all relationships are still statistically significant. The number of mobile operators a person uses is negatively related to customer loyalty (β=-0.071) but this influence is not statistically significant. On the other hand, company image is

not related to customer loyalty at all in this 20% subsample.

For this subsample, the assumption of random errors, homoscedasticity and the assumption of the normality of residuals have been met. VIF (1.949 highest value) and tolerance (0.513 lowest value) are at acceptable levels. It is expected that 5% of the residuals fall outside +-2 standardized residuals, i.e. 10 cases. In this subsample, there are 9 cases that fall outside +-2 standardized residuals. Therefore, less than 5% error is present in the model, and the model is acceptable. All Cook distances are below 1. The average leverage value is 0.0255, and two cases fall outside this border. But it is still below the second most stringent criterion of 0.051. The highest Mahalanobis parameter is 6, quite lower than the usual cut-off point of 12 for samples over 100. All standardized DFBeta values are below 1. The highest value is 0.46. A covariance ratio boundary does not satisfy five cases, therefore deleting cases could improve the precision of some model parameters. But as the Cook distance is below 1, it is not necessary to exclude these cases from analysis.

After performing the split sample procedure in the subsample that consisted of 20% of random cases from the initial sample, it can be noticed that image as a predictor variable is not present in the final model. Therefore, if we compare the initial sample and 20% subsample, it can be observed that R^2 (adj) is lower in the initial sample (0.517) in comparison with the 20% subsample (0.587). Hence, it can be concluded that customer loyalty can be better explained with just relationship commitment and relational equity, i.e. image can be excluded from the model. Therefore, we can conclude that the proposed hypotheses H1 and H2 have been confirmed. Contrary to these, H3 hypothesis has not been confirmed, because, in the 20% subsample, company image was not included in the hierarchical regression model. Also, H4 has not been confirmed because when other customer loyalty antecedents are added to the regression model, its influence on customer loyalty is statistically not significant. But its direction was correctly suggested, i.e. as being negative.

V. CONCLUSION

This paper contributes to the recognition of relationship commitment and relational equity as important antecedents of customer loyalty that should not be neglected. Additional findings concerning company image do not support the well-established idea that company image contributes to creating customer loyalty. Moreover, in the full sample model, company image contributes in the least degree to customer loyalty, while in the model validation stage, we found no significant relationship with customer loyalty in mobile telecommunications.

Research results could serve decision-makers in companies that seek to create and develop customer loyalty. Therefore, companies should invest in the development of relationship commitment if they want to boost customer loyalty. Relationship commitment, i.e. the desire to maintain a relationship, is developed through partnership with customers, as well as by offering value to customers. By collaborating with customers, a company can get more information about customer needs and desires, and consequently include customers' information in product/service design. They can also include customers in product/service innovation and reinforce relationships with them. This practice establishes a great pool of information for providing value to customers. Furthermore, providing value to customers also

augments customer relationship commitment. With a products/services offering that satisfies a customer's needs and provides benefits, the customer perceives that he/she is getting value from a company. Consequently, the idea prevails that this is a relationship worth maintaining.

However, decision-makers have to take into account that there are some factors that hinder customer willingness to engage in a relationship with a company. These factors are perceptions of inconvenience and anticipated benefits, privacy concerns, involvement with a firm and shopping frequency (Ashley, Noble, Donthu and Lemon, 2011). Therefore, a company has to acknowledge their existence and act upon them in order to diminish their influence on building relationships with customers.

Research also established a relationship between relational equity and customer loyalty. Companies, through their actions, have to support a sense of fairness among their customers, as well. For a long-term relationship, it is necessary for customers to perceive that the relationship is equitable for all actors involved. Hence, a fair distribution of costs and benefits within a relationship is needed. For achieving relational equity, a company has to build collaborative relationships with customers. Information from these relationships, as well as customer insight, is highly valued in defining customer cost-benefit ratio perception.

Companies emphasize the role of positive image in developing relationships with customers. Research conducted, however, did not provide evidence for this claim. Moreover, company image is found to have little influence on customer loyalty compared with relationship commitment and relational equity. This could serve as a guiding light to companies that are investing a lot of energy into building consistent company image, while neglecting to build collaborative relationships that could augment customer loyalty formation more efficiently. Therefore, company image is not so important an element that corporate strategy, aimed at building customer loyalty, should focus too heavily on it.

Up till now, customer loyalty has been mostly conceptualized as a two-dimensional construct, consisting of attitudinal and behavioural loyalty. By including cognitive loyalty, companies can more profoundly understand their customers. This third dimension brings a new perspective to understanding customer loyalty. This is due to its operationalization as insensitivity to price due to loyalty. This will help decision-makers to identify those customer segments that continue doing business with a company even if prices increase.

Future research could concentrate on exploring other variables that will add to explaining how customer loyalty can be boosted. Further research could also be aimed at exploring the moderator effects of, for example, primary or multiple mobile operators on the relationship between customer loyalty and its antecedents. The limitations of this paper are evident in sampling units. As the sample consisted of mostly young people and women, results could provide additional value for decision-makers if an older and more gender-diverse population were included into the sample.

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PREDANOST U ODNOSU, RELACIJSKA PRAVEDNOST TE IMIDŽ PODUZEĆA KAO ELEMENTI RAZVOJA ODANOSTI POTROŠAČA

SAŽETAK

U radu se analizira povezanost odanosti potrošača s preduvjetima odanosti kao što su: predanost u odnosu, relacijska pravednost i imidž poduzeća. Spomenuti elementi rijetko se analiziraju, iako su važni kod stvaranja odanosti potrošača. Na temelju prethodnih istraživanja pretpostavlja se pozitivna povezanost između odabranih elemenata od utjecaja na odanost potrošača i same odanosti potrošača. Predloženi je konceptualni model provjeren na podacima dobivenima od korisnika mobilnih operatera. Istraživanje pokazuje da postoji statistički značajna pozitivna povezanost između predanosti u odnosu i relacijske pravednosti te odanosti potrošača. S druge strane, imidž poduzeća statistički značajno ne pridonosi stvaranju odanosti potrošača u mobilnim telekomunikacijama. Dodatno, rezultati dobiveni hijerarhijskom multiplom regresijskom analizom dokazuju da broj različitih mobilnih operatera, koje osoba koristi, nije povezan s odanosti potrošača kada se u model uključe predanost u odnosu, relacijska pravednost i imidž poduzeća. Na temelju rezultata istraživanja, rad nudi prijedloge za upravljanje odanosti potrošača.

Ključne riječi: *odanost potrošača, predanost u odnosu, relacijska pravednost, imidž poduzeća, telekomunikacije*

WELLNESS: A NEW MODE OF TOURISM

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ABSTRACT

Like all other sectors of the world economy, tourism is also feeling the pinch of the crisis that has resulted from the global economic turmoil. World economic situation since 2007/2008 has put an extra pressure on people's psycho-physical state of health. People are increasingly looking forward to new ways of relaxation and re-energizing themselves. Some modes of tourism, globally, due to the economic downturn, have slowed down, but the tourism sector itself has done remarkably well during the last two-three years by offering the new model i.e. facility generally called *Wellness*. Within tourism, wellness is relatively a new trend that has registered an impressive growth rate. World-wide more and more people are traveling to destinations that provide wellness facilities. The rise of 'wellness' concept can be attributed to two factors. First, the WHO has now long been pushing forward an integrated concept of «well-being» and «fitness» into its global health policy. Second, the overall education of people has increased the human awareness of personal health. Tourism service providers, especially the luxury hotels were quick to cash upon these facts and created a palette of wellness services such as spa and health treatments, occupational health therapy, beauty treatments, sports' facilities, spiritual activities, massages, and rehabilitation programs, etc.

Since sufficient data on the subject have not yet emerged, the paper basically discusses some conceptual aspects of wellness tourism only.

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I. INTRODUCTION

Over the last decade, the world is undergoing far-reaching changes in attitudes, behavior and economic life of the people. Frequent natural disasters and global economic crisis have resulted in economic miseries of the people. Long existing widespread hunger and under nourishment, poverty and unemployment have not only resulted in economic decline (fall in consumption, savings and investments, deterioration of standards of living etc.) but also in social discontent and fall in the happiness index[2].

Economic crisis that is underway has been affected by the negative growth effects. Practically, all sectors of the national economies have been experiencing the effects, and tourism is no exception.

By nature, humans are resilient and in face of odds and always try to find *via media* solutions. In the tourism sector against all the economic odds, dissatisfaction and depression among people has found refuge in ways of relaxation of soul, body and mind. People, during the last five years, have increasingly turned towards the ways of health and wellness activities. Tourism providers have, accordingly, made good on the opportunity and offered attractive wellness packages in specialized destination.

While in the late 1980s and 1990s most of the such destinations were primarily located in SE Asia, however, in the current decade, more and more European destinations are becoming popular. With Switzerland and France being the cherished destinations of the rich, highly competitive European destinations like Austria, Greece, Italy, Spain, Croatia, Turkey and others, have been successfully offering wellness facilities and having some comparative advantages. Naturally, the already established destinations in the SE Asia remains strong competitors in the market. However, at least in Europe, increased number of people is looking for nearest locations. Although, leading luxury hotels are among the top providers of such services, modest wellness service providers have successfully entered this emerging market. Not only more and more new destinations and service providers are emerging but also new wellness services are being developed offering the tourists attractive choices.

II. THE CONCEPTS OF HEALTH AND WELLNESS

The term '*health tourism*' has not been well defined. Since the 1970s it has implied 'the provision of health facilities utilizing the natural resources of the country, in particular mineral water ad climate'. Goodrich and Goodrich (1987, 217) define it as:

[2]The neo-classical economic theory subjectively defines happiness and has long been the standard of measurement used interchangeably with utility as well as the general welfare. Modern classical economics no longer attempts to quantify happiness or satisfaction through measurements in consumption and profits. Instead, argues that individual's preference is revealed through choice. The idea that modern neoclassical economics define happiness on the basis of consumption is widely disputed.

The Happy Planet Index (HPI) is an index of human well-being and environmental impact that was introduced by the New Economics Foundation (NEF) in July 2006. The index is designed to challenge well-established indices of countries' development, such as Gross Domestic Product (GDP) and the Human Development Index (HDI), which are seen as not taking sustainability into account. In particular, GDP is seen as inappropriate, as the usual ultimate aim of most people is not to be rich, but to be happy and healthy. Furthermore, it is believed that the notion of sustainable development requires a measure of the environmental costs of pursuing those goals.

«an attempt on the part of a tourist facility to attract tourists by deliberately promoting its health-care services and facilities, in addition to its regular amenities. These health care services may include medical examinations by qualified doctors and nurses at the resort or hotel, special diets, acupuncture, trans-vital injections, vitamin complex intakes, special medical treatments for various diseases such as arthritis, and herbal medicines".

Hall (1992, 151) provides an analysis of health tourism within the context of adventure and sport tourism. Health tourism is compared to tourism based on its activities particularly

- Sun and fun activities
- Engaging healthy activities
- Motivation for travel is primarily health
- Travel for sauna, massage, and other health activities
- Medical treatment

Muller and Kaufmann (2000) make a distinction between health and wellness. They regard wellness tourism as a subset of health tourism. According to Dunn (1959) wellness is a "sate of health, which comprises an overall sense of well being and sees a person as consisting body, mind and spirit. Lifestyle and self-responsibility for health see paramount in the quest for a better quality of the life. In some countries like Germany, Austria and Switzerland, there is a considerable emphasis on 'medical well-ness'.

It is believed that the term wellness has emerged from the WHO notion of 'well-being' and the concept of fitness. In the Central and Southeast European countries, there is an enhanced emphasis on sunshine, sea air, and thalassotherapy. Physical fitness is also seen as an integral part of everyday wellness. In Asian countries, many spiritual activities such as yoga, meditation, and massages are considered important daily activities.

The concept of wellness clearly means different in contexts and countries. We can demonstrate the wide range of health and wellness products and facilities as shown in Table - 1.

TABLE – 1. Concept of Health and Wellness Tourism

Health Tourism				
Wellness			*Medical*	
Holistic	Leisure and Recreation	Medical Wellness	Therapeutic	Surgical
Spiritual	Beauty Treatment	Therapeutic Recreation	Illness related Rehabilitation	Cosmetic Surgery
Yoga and Meditation	Sport and Fitness	Lifestyle related Rehabilitation	Healing and Recuperation	Dentistry
New Age	Pampering	Occupational Wellness	Thalassotherapy, Nutritional and Detox Programs	Operations and Transplants
Types of Health Tourism Facilities				
Retreat		Spas		Clinics and Hospitals
Ashram		Hotels and Resorts		
Festivals		Leisure Centers		Cruises

SOURCE: Adapted from Smith and Puczko (2009:7)

III: REVIEW OF LITERATURE

Since the concept of wellness is of a relatively recent origin, the subject is not loaded with substantial scientific literature. A few books, reports and surveys are available around the world. Following is a selection of some recent available material we provide in this paper some insight on the subject matter that may facilitate the scholars to undertake some serious research on related issues of wellness.

(2002) **The Wellness Revolution: How to Make a Fortune in a Trillion Dollar Industry**, Paul Z Pilzer, (New York: Kindle Ed.), is an easy to read a book for mass readers. The author stresses the growing significance of wellness therapy in health tourism calling it a 'revolution' in the industry. The book explores varied possibilities for new entrepreneurs in the wellness and health care industry.

(2008) **Understanding the Global Spa Industry** (ed.), Marc Cohen & Gerard Bodekar (London: Butterworth-Heinemann) Examines the management practices in the spa industry and offers a groundbreaking and comprehensive approach to global management. He book examines the spa services and development of the spa business from its historical beginnings to the size of the market today: business development and planning, spa operations and business models; spa products and technologies and the application of branding and market strategies; infrastructure, design and environmental issues, including the sustainability and social and environmental benchmarking; human resources from education and training to professional and regulatory issues and professional and corporate ethics and values.

(2008) **Fitness and Wellness** is a short report prepared by the Research Group of (San Francisco/Boston: Merriman Curhan Ford). It focuses on the obesity problem in the US costing millions of dollars annually in lower productivity, higher absenteeism rates, as well as higher health care costs (estimated to be around 957 billion US$ by 2030. As a result spa industry, along with Yoga and Pilates practices is striving to provide integrated services for mind, body and spirit with exercise. The study provides an insight as to how the consumers can lose weight, lower cholesterol, reduce weight and achieve overall well-being. The report also provides basic information on fitness equipment market, gym and spa industry in the US.

(2008) **Health & Wellness Tourism**, Caribbean Export Development Agency: Barbados) is a statement of ten point strategy of success of wellness tourism. It provides an insight in the CSME (Caribbean Single Market & Economy) tourism market in four segments (1) medical tourism; (2) wellness and spa; (3) nursing and elderly care; and (4) diagnostic service. It stresses upon identifying target market, overcoming potential barriers, knowing what the competitors are doing, and differentiation of product and employing promotion strategy.

(2009) **Health and Wellness Tourism** (ed), Melanie Smith and Laszlo Puczko, (London: Butterworth-Heinemann), takes an innovative look at this rapidly growing sector of today's thriving tourist industry. The book examines the range of motivations that drives this diverse sector of tourists, the products that are being developed to meet their needs and the management implications of these developments. A wide range of international case studies

(e.g. Belgium, Finland, Italy, India, Japan, New Zealand, Russia, Slovenia, South Africa, The Netherlands, UK and the US) illustrate the multiple aspects of the industry and emerging trends including spas, medical wellness, meditation, festivals, pilgrimage and yoga retreats. The authors also evaluate marketing and promotional strategies and assess operational and management issues in the context of health and wellness tourism. Special attention is drawn to the motivations and profiles of the wellness tourist and segmentation and management of market demand and supply.

(2010) **Spas and the Global Wellness Market**: **Synergies and Opportunities**, Palo Alto, California: Stanford Research Institute) is an elaborate (104 page) market report on the spas and the global wellness market. It is not only a study of the wellness concept and methodology but also of the growing global wellness market, the wellness consumers and of opportunities for spas in the industry.

IV. HISTORICAL OVERVIEW

Many visitors to modern day health and wellness centers are often unaware of the cultural origins of treatments they enjoy. They may not realize that Indian Ayurvedic practices go back as far as 5000 BC, or that the Egyptian women around 3000 BC used same sort of cosmetics as today. Chinese medical practices go back to 1000 BC. Earliest reference to healing waters of spas (Latin *sanitas per aqua*) is about 1700 BC. Greeks, Romans and Ottomans have left a legacy of baths to the Europeans. Ancient civilizations of Asia and the Middle East have been well aware of benefits of massage, yoga, meditation, herbal medicines, and other forms of healing and spiritual practices for many more centuries than in Europe. While the Siamese (Thai) practiced massage even before 100 BC, the Japanese used natural therapy springs in 737 AD, the Indians have practiced Ayurvedic treatments in their Ashrams.

The history of health tourism in Europe has tended to be based around spas and seawater treatments. Hydrotherapy or water-based treatments are the cornerstone of what European spas have traditionally had to offer with a focus on health and physical well-being. It is only in the recent years that cosmetic and beauty treatment has become more popular, as well as more spiritual and psychological activities. As with the improved health standard of people in Europe improved, spas increasingly shifted their focus from physical and medical (mineral water, thermal water, seawater, mud, climate and oxygen therapy, special diets, etc.) to more relaxing and body pampering activities (focused on body and beauty treatments including massage, steam and sauna, and relaxation in pools and baths).

After the World War II, while in Western Europe spas became stagnant, in the East European countries they were boosted by the State under communism. In many EE countries these specialized in medical treatments and changed their professional appearance after 1990.

Lee (2004) suggests that the European health and wellness model is based on four elements: water, fire, earth and air. *Water* therapies help to heal and soothe the body; *heat* treatment induces body sweating and accelerating blood circulation; *earth* offers numbers of herbs, flowers, plants, fruits and mud; and fresh *air* and oxygen are the essence of life. A balance between these elements was considered essential by the Greek philosophers. However,

it must be noted that Indian[3] and Chinese[4] philosophies have for millenniums practiced models based on the harmonization of these elements. Siamese, Australian Aborigines and Maoris too have used herbal remedies, massages, deep spiritual beliefs in holistic ways to preserve the good health and enhance wellbeing. Tribal Africa has traditionally drawn from the desert's mud or clay, salt from the ocean and plants and herbs from forests, and used them for remedies and healing. Relaxation through massage used by the Masai tribes; spiritual and psycho-physical training technique for Zulu warriors; trance dances by Ancient Bushman are known practices in the African continent.

V. VARIOUS CONCEPTS RELATED TO WELLNESS

Wellness should not be confused by health. It is supposed to create harmony in mental, physical, spiritual or biological health in general and has stronger ties with changing lifestyle or doing something healthy than with curing a specific disease. As stated above, the concept of wellness is the co-product of the awareness of sound health, well being and happiness. The three elements differ in understanding.

As stated above, the concept of wellness was developed as a special state of health comprising an overall sense of well being which sees human being as consisting of body, spirit and mind and being dependent on their environment. In the western world people have attempted to define wellness by understanding as the harmony of body, mind and spirit, self-responsibility, physical fitness, beauty care, healthy nutrition, relaxation, meditation, mental activity, education, environmental sensitivity, and social contacts as fundamental elements. Wellness is an active process through which people become aware of, and make choices towards, a more successful existence. It advocates positive and optimistic outlook, and a holistic and balanced approach to life. The concept embraces physical, spiritual, intellectual, emotional, social and occupational aspects of life.

According to the Stanford Encyclopedia (2007) well being can be defined as 'what is non-instrumentally or ultimately good for a person'. It is more than just happiness. As well as 'feeling satisfied and happy, well being means developing as a person, being fulfilled, and making a contribution to the community' (NEF). Diener and Saligman (2004) consider following constitutes of high well being:

1. living in a democratic and stable society that meets material needs;
2. have supportive friends and family;
3. have rewarding and engaging employment with adequate income;
4. be reasonably healthy and able to treat physical and mental health problems;
5. have one's own value goals; and
6. have a philosophy/religion providing guidance and purpose to one's life.

Though the term 'quality of life' (QoL) is difficult to define, it has come to understand

[3] Prime healing tradition of India, Nepal, Sri Lanka, Burma and the Far East countries the *Ayurveda*, is regarded by the scholars as the oldest healing system in the world. A harmony between the three universal forces: air (*vata*), fire (*pitta*), and earth (*kapha*) is essential. According to this tradition *yoga* and *dhyan* (meditation) helps to keep and achieve this harmony.

[4] Traditional Chinese medical practices focus on the individual and provide a combination of three elements: energy (*chi*), governing force of vitality and longevity (*jing*), and the mind (*shen*). The complementary forces *yin* and *yang* govern the *chi*.

'peoples' satisfaction with their lives, their physical, mental, social and emotional health, and the nature of the environment in which they are living. It can be measured with quantitative indicators which are subjective and objective in nature. Objective indicators include: life expectancy, employment status, marital status, education, working hours per week, housing conditions, crime rates, poverty level, healthcare provisions and legal rights. The subjective indicators relate to happiness, job satisfaction, sense of community, family relationships, stress level, use of leisure time, degree of spirituality, sense of safety and number of enjoyed holidays. QoL is considered to have a balance of most of these mentioned elements. Researches in the field have shown that travel and tourism and travel have a positive correlation with QoL.

Happiness is a complex and almost an indefinable term. However, researchers believe that happiest people are those surrounded by family and friends; engage themselves in relaxing activities; are not focused on materialism; not obsessed with image, social status, and fame; are grateful for and satisfied with what they have; are altruistic; trust others and cooperate; and live in politically stable nations. Travel without doubt creates happiness on many levels. By visiting friends and relatives, participating in voluntary activities creates a feeling of belonging and love that forms an important part of happiness.

A wide spectrum of health and wellness tourism has developed in recent years (see table 2). These range from those which focus on physical or medical healing to those which have psychological or spiritual dimension. The holidays which take place within these environments would in some cases be radically different from one another. Depending upon motivation, life-stage, and interests tourists will select the form of wellness required and this could be purely physical with a focus on sports and fitness; medical with focus on disease treatment or surgery; mental or psychological with a focus on mind control; relaxing and pampering; entertaining and recreational or meditation and spiritual.

As wellness should focus on the balance of body, mind and spirit, Smith and Puczko (2009) suggest the spectrum of health tourism, which is also the base of holistic tourism. This can be shown as under in Table 2 and Table 3.

Since lately wellness tourism is on rise there is a trend to balance the high-touch aspect with the high-tech equipment applied to the monitoring, enhancing and maintenance of well-being.

TABLE – 2. Spectrum of Health Tourism

Physical Healing	Beauty Treatments	Leisure/ Entertainment	Life/Work Balance	Relaxation/ Rest	Psychological	Spiritual
Medical spas/baths	Cosmetic Surgery trips	Spa resorts with fun-waters	Holistic Centers	Pampering Spas/baths	Holistic Centers	Meditation retreats
Mofetta	Hotel/day spas	Sport/ fitness holidays	Occupational wellness workshops	Wellness hotels	Workshops	Yoga Centers
Surgery trips				Thalassotherapy Centers		Pilgrimages
Rehab. Retreats						

SOURCE: Smith and Puczko (2009:84)

TABLE 3: Body-Mind-Spirit Spectrum

B O D Y	Medical (therapeutic) tourism	Leisure spa tourism		S P I R I T
	Thalassic tourism	Medical (surgical) tourism		
		Holistic tourism	Yoga and Meditation tourism	
		Occupational wellness tourism	Spiritual tourism	
M I N D				

SOURCE: Smith and Puczko (2009:85)

Wellness assessment technologies include a wide range of methods designed to obtain information and then analyze and interpret it in order to form an understanding of a person's health and then use this information along with existing knowledge to inform the design and implementation of the most effective therapies. There is a very wide range of wellness assessment technologies that can be summarized as under:

1. Data recording
   Body measurement
   Electrophysiological measures
   Sleep studies
   Pedometry
   Bioenergetic testing

2. Direct questioning
Through formal and informal medical history on current and past illnesses, family, occupational, travel, dietary, lifestyle, and sex details.

3. Tissue sampling
Blood and urine analysis; hair, sweat, semen, breast milk, ear wax, finger nails and tissue biopsies.

4. Functional testing
Lung function, cognitive performance, auditory and visual function as well as fitness assessment, cardiovascular stress testing, nutritional challenge tests etc.

5. Data analysis and knowledge management
   Information and communications technology
   Electronic health information systems
   Knowledge management and bibliographical databases
   Clinical decision support and tele-medicine

CONCLUSION

From the above contents of wellness activities and the growing popularity of the concept within the health activities as a symbol of future trends in the consciousness of the people throughout the world is fast becoming a part of life style. It has now well been recognized by most people that for the longevity of life and general happiness it is important to devote a considerable part of leisure-time in health, sport, and other wellness activities. Economists are anxiously observing this trend and trying to understand and establish a correlation between wellness and productivity. Some experts in tourism are looking decades ahead and are optimistic of the rising trend. Investment and employment in this segment of market are expected to grow rapidly.

Unfortunately, for the time-being, there is not enough statistical data is available at sectoral, national or WTO level and thus it is rather difficult to make any serious economic analysis of this emerging phenomenon. Nevertheless, a trend is being evidenced at the microeconomic level and the tourist sector is positively responding to this specific demand. There definitely is a need for further research and exploration of the subject.

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WELLNES: NOVA MODA U TURIZMU

SAŽETAK

Poput svih drugih sektora svjetskoga gospodarstva, turizam je također osjetio pritisak krize koja se javila kao posljedica globalne gospodarske krize. Svjetska ekonomska situacija nakon 2007/2008 postavila je dodatni pritisak na psihofizičko stanje ljudi i njihovo zdravlje. Ljudi sve više traže nove načine opuštanja i regeneriranja. Neki oblici turizma, na globalnoj razini, zbog ekonomske krize, su usporeni, no turistički sektor u cjelini iznimno dobro stoji tijekom posljednje dvije-tri godina nudeći novi model turizma koji se općenito naziva Wellness. Unutar turizma, wellness je relativno novi trend koji registrira impresivan rast. Širom svijeta sve više i više ljudi koji putuju na odredišta koja pružaju wellness sadržaje. Jačanje 'wellness koncepta može se pripisati dvjema faktorima. Prvo, WHO odavno podupire integrirani koncept «blagostanja » i « fitness »u svoje globalne zdravstvene politike. Drugo, ukupno obrazovanje ljudi povećalo je ljudsku svijest o osobnom zdravlju. Ponuđači turističkih usluga, posebno luksuzni hoteli su se brzo prilagodili i stvorili paletu wellness usluge kao što su SPA i zdravstveni tretmani, zaštita zdravlja na radu, kozmetički tretmani, sportski objekti, duhovne aktivnosti, masaže, i programi rehabilitacije, itd. Budući da ne postoje baze podataka na temu wellness turizma ovaj članak u osnovi razmatra neke konceptualne aspekte wellness turizma.

Ključne riječi: sreća, meditacija, rekreacija, terapija, opće dobro.