

Financial **I/2013** Theory & Practice

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in Central and Eastern Europe

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Determinants of banks' net interest margins in Central and Eastern Europe

MIRNA DUMIČIĆ*
TOMISLAV RIDZAK*

Article**

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Abstract

This research analyzes the main determinants of the net interest margin of banks operating in Central and Eastern European (CEE) countries in the period from 1999 to 2010. The results reveal several main drivers of net interest margins in the CEE. Prior to 2008 the net interest margins declined primarily due to strong capital inflows and stable macroeconomic environment. In the crisis period, significant rise in government debt accompanied by the increase in macroeconomic risks and abating capital inflows were pushing margins up while other factors such as low credit demand, higher capitalization and significantly increased share of non-performing loans pressured banks' margins down. The results also confirm the important contribution of higher efficiency to lowering banks' margins.

Keywords: net interest margin, CEE

1 INTRODUCTION

The past few years in some of the Central and Eastern European¹ (CEE) countries have been marked by an ongoing debate among politicians, the financial industry academic community and the general public about banking sector profitability, which has been characterized both as too high and too low, depending on the point of view. There have also been many opposite opinions about the role of banks and their ability to promote the recovery of the real economy, especially in countries where credit activity is stagnating or is very low. In that context, one of the main questions raised has been related to the banks' and policymakers' options of lowering domestic interest rates and stimulating demand for credit in such a way.

The cost of financial intermediation is an important determinant of total financing costs. According to the literature (i.e. Maudos and de Guevarra, 2004; Claeys and Vander Vennet, 2008; Kasman et al., 2010) there is a strong connection between the degree and cost of financial intermediation and economic growth, as funding costs have a significant impact on the investment level and capital allocation, and thus in turn on growth potential and the direction of economic activity. They also affect the profitability of the banking sector and therefore its stability and ability to support the real economy (García-Herrero, Gavilá and Santabábara, 2009).

In spite of the importance of borrowing conditions for economic recovery and, in turn, for financial system stability, this area has not been researched extensively with respect to CEE countries in the period during and after the onset of the recent financial crisis. Most of the papers studying the net interest margins in these countries focus on the period of banking sector consolidation in the early 2000s and the post-consolidation period, which has been marked by a successful transformation of those banks into modern, market-oriented financial institutions. However, the recent crisis, marked by a severe slowdown and drop in real GDP and

¹ Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia.

mostly very slow (if any) recovery combined with very mild credit activity of commercial banks, has drawn lots of attention to the interconnectedness between financial institutions and the real economy.

Banks charge and pay many types of interest rates and have a variety of different categories of assets and liabilities and there is no unique way of measuring the difference between what they charge for lending and the price of their funding sources. One of the best and most widely used indicator of the cost and efficiency of financial intermediation is a bank's net interest margin. It is calculated as the ratio of net interest income and total bank earning assets, where net interest income is equal to the difference between interest earned and interest paid. Regardless of its common use, it should be noted that this indicator has some potential weaknesses, as it does not take into account other sources of income and costs for the bank and is not good representative of a bank's marginal costs and revenues (for details see Brock and Suarez, 2000).

Higher net interest margins usually imply lower banking sector efficiency, marked by higher costs due to inefficient control of operating expenses, and have a negative impact on financial developments, resulting with lower investments and slower economic activity. They might also reflect a high risk premia due to inappropriate regulation of the banking sector or a significant information asymmetry (Claeys and Vander Vennet, 2008). On the other hand, lower net interest margins usually mark deeper and more developed financial markets, encourage investment activities and support economic growth. However, as emphasized by Schweiger and Liebeg (2009), the benefits of a lower cost of financial intermediation will only be effectuated if banks price risks in a prudent manner.

From banks' perspective, the net interest margin is an important determinant of their profitability, while from the real economy point of view, combined with the country risk, macroeconomic variables, client risk, competition, etc. it is one of the key factors influencing the overall level of interest rates for the private sector. In bank-centric systems dominant in European emerging markets where bank loans are the main funding source, factors that affect loan availability also influence the stability of the whole banking sector.

This research aims to find the main determinants of the net interest margin in eleven CEE countries: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia. The total sample consists of 12 periods (from 1999 to 2010) and 152 cross sections (banks). We are particularly interested to find out how *bank-specific variables* are important for the level of net interest margin compared to the specific conditions in the country where bank operates.

One of the main contributions of this paper to the existing literature is its analysis of the period after the onset of the financial crisis, which has not yet been done for this region. Apart from that, we use the Arellano and Bover (1995) system GMM estimator, which solves endogeneity problems and allows for the inclusion of a lagged dependent variable together with fixed effects to control for unobserved heterogeneity. Unlike most other papers dealing with CEE countries, we also take into account regulatory costs.

The results reveal several main drivers of net interest margins in CEE. Prior to 2008 the net interest margins declined primarily due to strong capital inflows and the stable macroeconomic environment. In the crisis period, a significant rise in government debt accompanied by the increase in macroeconomic risks and abated capital inflows pushed margins up while other factors such as low demand (due to weak economic performance), higher capitalization and significantly increased share of non-performing loans pressured banks' margins down. The results also confirm the important contribution of higher efficiency to lowering banks' margins. This leads to the conclusion that policymakers can influence the costs of financial intermediation by conducting prudent and sustainable policies aimed at preventing and mitigating risk accumulation and creating a stable macroeconomic environment, accordingly indirectly supporting economic activity.

The rest of the paper is organized in the following way. Section two summarizes the main findings from the literature investigating the main determinants of banks' profitability and costs of financial intermediation. The third section describes the data used in the empirical part of the paper, section four gives an overview of stylized facts, while the methodology is explained in the fifth part. The main results and robustness checks are presented in section six. Concluding remarks, as well as some policy implications based on the research outcome, are provided in the seventh section.

2 LITERATURE SURVEY

Table A1 (in the appendix) presents some of the most relevant research papers that study banks' efficiency and the cost of financial intermediation. The main question posed in the literature relates to the fundamental elements that influence the cost of financial intermediation. The literature identifies several prime drivers of net interest margins (managerial efficiency, macroeconomic volatility and competitive pressures). Regarding policy-related questions, the literature has looked into the role of macroeconomic, financial stability and regulatory policies as determinants of interest margins. For instance, one question relates to potential role of central banks in lowering interest rate volatility (Saunders and Schumacher, 2000) or the role of banking sector regulation in fostering market competition, building up stronger capital adequacy rules, lowering credit risk and thereby affecting net interest margins (e.g. Claeys and Vander Vennet, 2008; Maudos and de Guevara, 2004; Hasan Khan and Khan, 2010).

In terms of the empirical framework most of the papers base their empirical research on the microeconomic dealership model introduced by Ho and Saunders (1981), who view the bank as a dealer facing uncertainty and costs coming from the stochastic nature of loan demand and deposit inflows, which are covered by different fees. There are three empirical approaches in estimating this model, depending on the availability of the data and the interest of the researchers.

The first approach is based on a two-step procedure, where in the first step the net interest margins are regressed on a set of bank specific explanatory variables. The resulting constant in this regression is a measure of the pure interest margin for the country in question, which is calculated for each time period. In the second step, the time series of pure interest rate spread is regressed on the second set of explanatory variables: macroeconomic variables, interest rates and their volatility. The constant term in this step reflects the effects of market structure on the spread determination after bank specific and macroeconomic effects have been cleaned out. Such an approach is characteristic of a single-country analysis with long time series (Brock and Suarez, 2000; Saunders and Schumacher, 2000; and Männasoo, 2010). In Männasoo (2010) second step regression is done by vector error correction model.

The second type of empirical approach was to use the single step approach and estimate a reduced equation that depicts the banks' behaviour with respect to various determinants of net interest margin. This approach has been mainly used in cross-country studies, where in addition to bank and banking market specific variables researchers also include macroeconomic variables to capture the effect of banks' country of operation characteristics. Apart from that, the variables used are the same as those in the previous approach. In terms of estimation techniques, this approach uses estimates on a pooled dataset, generalized least squares or least squares with fixed effects (Claeys and Vander Venet, 2008; Maudos and de Guevara, 2004; Kasman et al., 2010; and Hasan Khan and Khan, 2010).

The third type of empirical approach builds on the second, but extends it empirically. Several potential problems are addressed here. The first is that the net interest margins show a tendency to persist over time, which could be a sign of competitive position of the bank, serially correlated macroeconomic shocks and information opacity (Dietrich and Wanzenried, 2011). An additional problem could be endogeneity. As García-Herrero et al. (2009) explain, more profitable banks may be able to increase their equity more easily by retaining profits or they could invest in advertising campaigns to increase size, which can increase their profitability. Finally, as before, the researcher needs to take care of unobservable heterogeneity which is usually controlled by using fixed effects. This is why some authors opted for the GMM estimator which solves these problems (García-Herrero, Gavilá and Santabábara, 2009; Dietrich and Wanzenried, 2011).

Apart from the net interest margin some authors use different variables as an alternative proxy for bank profitability and cost of financial intermediation such as return on average assets (ROAA) and return on average equity (ROAE) (Athanasoglou, Delis and Staikouras, 2006; Dietrich and Wanzenried, 2011).

The literature surveyed shows that the characteristics of the individual banks are among the most important determinants of banks' business results and financing costs for their clients. Variables most commonly used for this purpose are different items (or their ratios) from financial and other reports that measure operational efficiency, quality of management, income structure, balance-sheet structure, credit activity, capital adequacy, liquidity, risk aversion, loan quality, credit risk, interest risk, opportunity costs of bank reserves, as well as bank size and ownership structure.

Conclusions about the impact of macroeconomic conditions on interest margins and banking sector efficiency have been ambiguous. Uncertainty and deterioration in macroeconomic conditions might increase interest margins and vice versa, but as mentioned by Claeys and Vander Vennet (2004), higher economic growth could also result in higher interest margins due to more intense credit activity and better loan quality. One of the things most authors agree on is that lower inflation implies lower interest margins.

Due to the problems with measurement, few papers explore the impact of regulatory costs on the cost of financial intermediation. Ho and Saunders (1981) emphasize that the cost of banks' funds is affected not only by the level of reserve requirements, but also by the opportunity cost of holding reserves usually measured by short-term risk free rate. Brock and Suarez (2000) and Saunders and Schumacher (2000) agree that higher reserve requirements get translated into higher interest spreads.

The influence of banking market structure on banks' efficiency has been investigated in many papers and is commonly measured by the Herfindahl index² or Lerner index³. Specific features of the banking markets influence the market power of each specific bank and impact the pricing policy, and therefore can pressure net interest margins. This implies that a more competitive environment should be able to support lower interest margins, but as mentioned in Dietrich and Wanzenried (2011), higher concentration might also be a consequence of a strong competition among banks and therefore result in lower interest margins. Another way of looking at the impact of competition, as noted by Claeys and Vander Vennet (2004) and Schweiger and Liebeg (2009), is that it might encourage banks to take a higher risk or not price it adequately, resulting in suboptimal interest margins and potentially leading to the instability of the whole banking sector.

² Sum of the squares of market shares in total assets of the individual banks.

³ Proxy of market power = (Total Revenue – Total Cost) / Total Revenue.

3 DATA AND SELECTED VARIABLES

We analyse banks from 11 CEE countries, and the sample consists of 12 periods (from 1999 to 2010) and 152 cross sections. For the full sample this gives the minimum of 823 observations, after the missing bank-year items were deleted. Table 1 lists the data used together with the sources and descriptions. Before the econometric analysis the data were revised and checked for extreme values and possible reporting errors. Table A2 in the appendix presents descriptive statistics for the panel data set used in the analysis. All variables have also been checked for stationarity using panel unit root test (table A3), but it is important to note that due to limited time dimensions these tests might have a low power.

The dependent variable in the empirical part of research is the net interest margin. It measures the cost and efficiency of financial intermediation and is determined by the variables that can be influenced by a bank's management, as well as by environmental variables that are primarily features of the market and country where the bank operates, mostly outside the management's control.

Explanatory variables are divided into three groups: bank specific variables, country specific macroeconomic characteristics and banking market specific variables (table 1).

While measuring the impact of the bank specific variables we focus on several major factors that contribute to the bank's performance: efficiency in conducting its operations, risk, leverage, possible substitution between interest and non-interest revenues and finally, benefits of the economy of scale.

Cost to income ratio measures the banks' efficiency. This variable shows how expensive it is for a bank to produce a unit of operating income in terms of costs not related to interest expense. It is expected that banks with high unit costs require higher margins in order to cover these expenses (Maudos and de Guevara, 2004), while at the same time higher operational efficiency allows banks to lower interest margins through lower loan rates or higher deposit rates (Claeys and Vander Vennet, 2008).

Banks might be willing to forgo part of their interest income if they substitute other forms of income for it, i.e. fees and commissions on other services. As found by Kasman et al. (2010), this substitution effect might be very important in explaining the level of net interest margin. This is why some banks have lower interest rates for clients that use a group of other services provided by the bank.

TABLE 1
Data description

Category	Designation in the formula	Name	Unit	Description	Source	Expected effect
Dependent variable	y	Net interest margin	%	Net interest income divided by average earning assets. Net interest income is defined as the gross interest income plus dividend income.	BankScope	n/a
		Cost to income ratio	%	Measure of operating efficiency is calculated as the ratio of sum of personnel expenses and operating expenses such as depreciation, amortisation, administrative expenses, occupancy costs, software costs, operating lease rentals, audit and professional fees and other operating expenses of an administrative nature and operating income before provisions. Measures costs of running the bank as percentage of income generated before provisions.	BankScope	-
Bank specific variables	x	Total capital ratio	%	Total capital adequacy measure. It combines Tier 1 and Tier 2 capital as a percentage of risk weighted assets. Proxy for a regulatory cost related to capital adequacy requirements.	BankScope	+
		Ratio of noninterest revenue to gross revenue	%	Measures the revenues the banks have from other services such as fees and commissions. Higher revenue from such sources might be a compensation for lower interest revenues.	BankScope	-
		Ratio of loans to customer deposits	%	This liquidity or funding ratio indicates to what extent the bank's relatively illiquid loans are funded by relatively stable customer deposits rather than wholesale or market funding.	BankScope	+/-
		Ratio of reserves for impaired loans to impaired loans	%	A higher ratio implies better provisions of the bank for bad loans and assets quality.	BankScope	+/-

Category	Designation in the formula	Name	Unit	Description	Source	Expected effect
Banking market specific variables	w	Concentration	%	Share of total assets in a country held by three largest banks.	Own calculation, BankScope data	+/-
		GDP growth	%	Growth rate of real GDP.	Eurostat	+
		Current account	%	Ratio of current account balance to GDP.	Eurostat	+
		Government debt	%	Ratio of general government consolidated debt to GDP.	Eurostat	+
		Inflation	%	Average annual rate of change of HICP.	Eurostat	+/-
Macro- economic variables	z	3 month money market rate	%	Domestic money market interest rate.	Eurostat	+
		Country spread	basis points	Spreads on international government bonds, own calculation based on Merrill Lynch government bond yield data.	Bloomberg	-
		Regulatory cost	%	Calculated as the ratio of bank reserves held at central bank and M3, this variable serves as a proxy for a part of the regulatory costs.	IFS	+

Credit risk belongs to the group of factors with the highest impact on banks' interest margins (Schweiger and Liebeg, 2009; Saad and El-Moussawi, 2010). Following Maudos and de Guevara (2004) and Kasman et al. (2010), it is proxied by the ratio of loans to total assets. Banks are expected to charge higher interest rates in order to compensate for higher credit risk. In that context, Athanasoglou, Delis and Staikouras (2006) emphasize the importance of credit risk management, which has not always been appropriate in the SEE region.

The ratio of loans to customer deposits represents a proxy for the liquidity risk, which has become particularly significant during the financial crisis when the interbank market was almost frozen and marked by liquidity hoarding, a drop in volume and an increase in the interbank interest rates in the EU (Heider, Hoerova and Holthausen, 2009; Gabrielli, 2010). Apart from that, banks in the CEE countries might have also been affected by deleveraging as their owners need to fulfil tougher capital requirements⁴. The impact of this ratio on the net interest margin

⁴ Speech of the Hungarian Central Bank Governor at G20 meeting, available at <http://www.ebrd.com/downloads/news/simor-andras.pdf>.

can be ambiguous, depending on whether deposits are cheaper than wholesale funding.

Capital adequacy ratio is a standard proxy for the creditworthiness of the bank. Capital adequacy rules are set by the regulator with the aim of preventing banks from accepting too much risk and ensuring banking sector stability (Claeys and Vander Vennet, 2008), although the actual level of capital adequacy that bank maintains is a result of combination of factors (regulation, market pressures, business strategy of the bank). Expected sign of relationship between net interest margin and capital adequacy ratio can go both ways, depending on the magnitude of transfer of these factors to clients. According to Saunders and Schumacher (2000), it is expected that banking systems with lower regulatory costs (such as reserve and capital requirements) have narrower margins.

An additional measure of regulatory costs is a ratio of bank reserves held at the central bank and M3. It is expected that countries with higher costs of regulation will have more reserves placed with the central bank. We are aware that such a measure has some drawbacks but we believe that in the studied period it is a good proxy for regulatory costs in the CEE countries.

The influence of non-performing loans on the net interest margins is measured by the coverage of impaired loans with reserves. The rise in the share of non-performing loans and increased reservations for bad loans hurt bank's profitability, especially during the crisis. International accounting standards (IAS 39) stipulate that the interest on the loan that is impaired is accrued only on the recoverable amount⁵. Provisions for bad loans can also be used as tool for income smoothing, where in good times provisions are on a level higher than the expected loss and in bad times they are underrated, as documented by Fonesca and Gonzales (2008). Consequently, the link between nonperforming loans and net interest margin might be ambiguous.

The influence of market structure on the net interest margin is measured by the share of the three largest banks in total assets of the banking sector. A more concentrated banking market might imply higher margins for all banks in the market as banks exploit their market power.

In order to measure the macroeconomic conditions in the banks' environment we use GDP growth, inflation, share of current account deficit in GDP and share of general government debt in GDP. Level of short term interest rates in the economy measures the stance of the economic policy. As an alternative, we estimate a specification that includes only yield spread on comparable government eurobonds from the observed countries and German government bond instead of a full set of macroeconomic indicators. This approach was motivated by findings presented in

⁵ Kruger (2002), page 13, <http://www.imf.org/external/np/sta/npl/eng/2002/rk0702.pdf>.

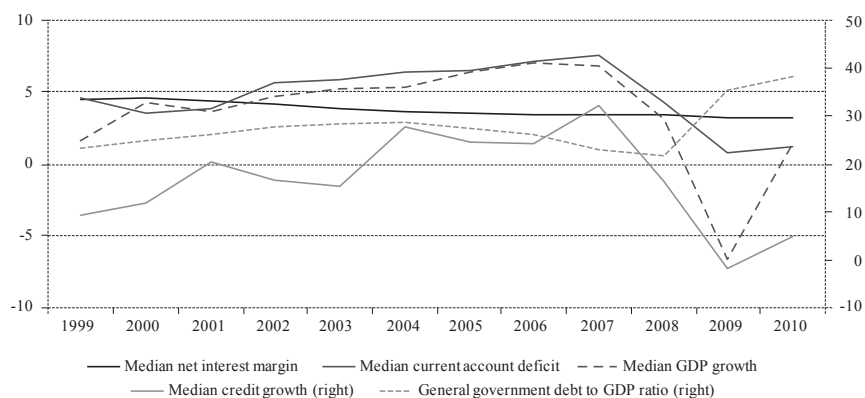
part of the literature on the determinants of emerging market bond spreads showing that the bond spreads include information about macroeconomic developments and other available information (Ferrucci, 2003; Alexopoulou, Bunda and Ferrando, 2009; Özatay, Özmen and Sahinbeyoglu, 2009). This specification also serves as the robustness check. Due to data availability, in this part of analysis time dimension for some countries is shortened.

4 STYLIZED FACTS

The median net interest margin for the sampled banks has been steadily decreasing during the studied period, indicating falling costs of financial intermediation. In the period prior to 2008 countries in the sample experienced relatively high rates of GDP growth combined with on average high capital inflows (measured by relatively high current account deficits) and were marked by high credit growth rates. Since 2008, as the crisis hit, GDP growth and capital inflows decreased significantly, together with credit activity (figure 1). Government debt to GDP increased from the beginning of the sample, especially after the onset of the crisis.

FIGURE 1

Net interest margin, GDP growth, government debt and current account deficit (%)



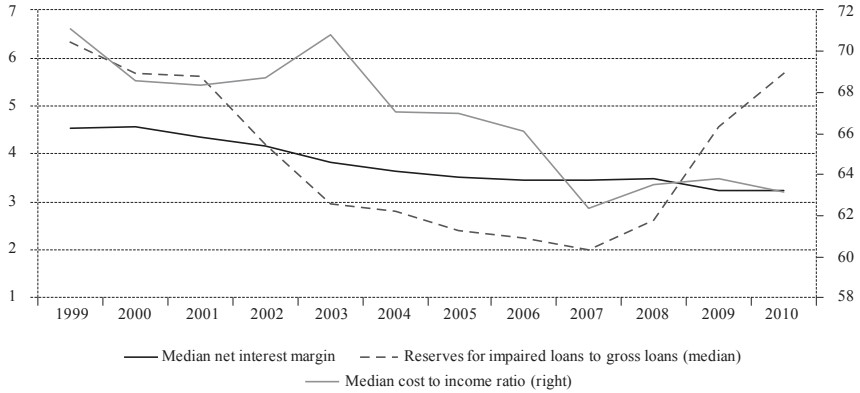
Source: *Bankscope, Eurostat, own calculations.*

Regarding bank specific variables, it should be noted that our sample starts in the year 1999, when the banking sector consolidation in CEE gained momentum (Kasman et al., 2010) and foreign investors had already become very important players in the CEE banking market. This process was marked by significant cost cutting and improved efficiency. The share of reserves for impaired loans, which was somewhat higher at the beginning of the sample (due to the Russian crisis and the still relatively underdeveloped bank management in the 1990s), gradually fell as assets grew. Similarly, the capital adequacy ratio for the median bank fell, implying on average, lower regulatory costs and reduced safety nets for the banks.

After the onset of the crisis, reserves for impaired loans increased as the share of nonperforming loans rose significantly and capitalization increased as banks and regulators started building safety nets (figures 2 and 3).

FIGURE 2

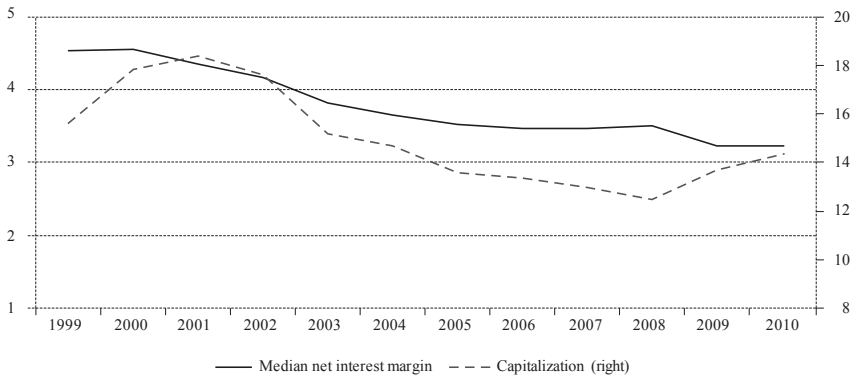
Net interest margin, reserves for impaired loans and cost to income ratio (%)



Source: Bankscope, own calculations.

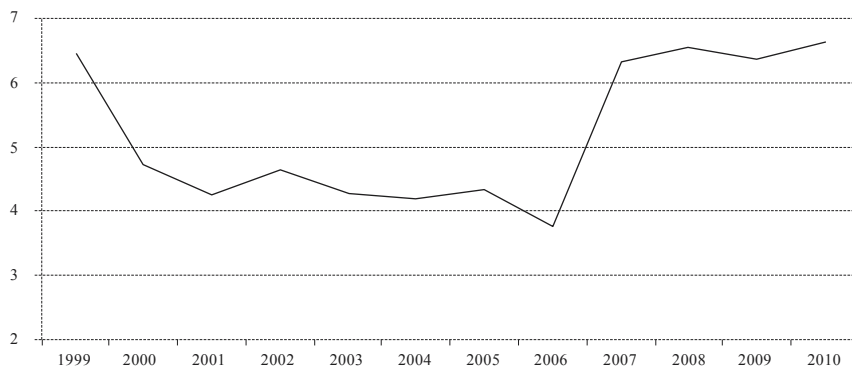
FIGURE 3

Net interest margin and capital adequacy ratio (%)

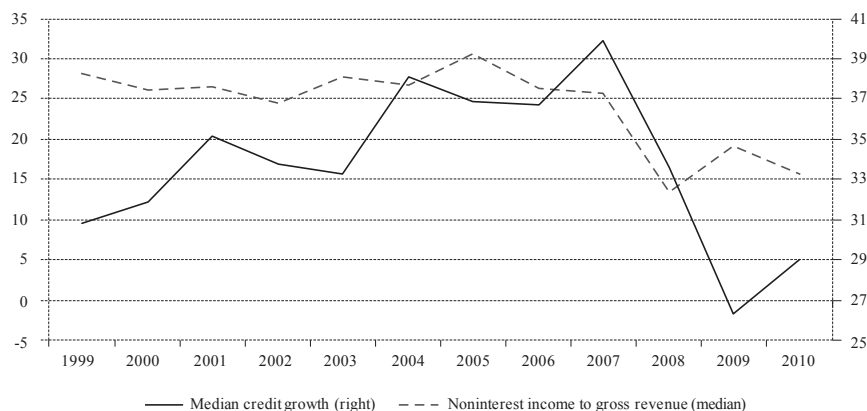


Source: Bankscope, own calculations.

In the pre-crisis period the standard deviation of net interest margin across banks was relatively low and increased significantly after it. This indicates that, after a period of relative tranquility in the CEE banking industry, the ongoing financial crisis and recession brought about diversification as a result of an accumulation of risks that were not properly managed (figure 4).

FIGURE 4*Standard deviation of net interest margin (%)**Source: Bankscope; own calculations.*

Finally, the share of non-interest income in gross revenue for the CEE banks fell significantly in the post 2008 period. This is probably due to the fact that various charges were linked with the credit granting process (figure 5) and as the credit activity dried out, this had an impact on non-interest income as well.

FIGURE 5*Credit growth and noninterest income to gross revenue (%)**Source: Bankscope; own calculations.*

Based on these observations, the main hypotheses on the determinants of interest rate margins can be formulated as follows:

- 1) Favourable macroeconomic conditions and high capital inflows are correlated with lower net interest margins.

- 2) Among bank specific variables, increased efficiency, decreasing capitalization and reserves for impaired loans are linked with lower net interest margins.

5 METHODOLOGY

The data generating process is assumed to be defined by:

$$\begin{aligned} y_{i,t} &= \alpha y_{i,t-1} + x'_{it} \beta + \varepsilon_{i,t} \\ \varepsilon_{i,t} &= \mu_i + v_{i,t} \\ E[\mu_i] &= E[v_{i,t}] = E[\mu_i v_{i,t}] = 0. \end{aligned} \quad (1)$$

The subscripts i and t are for the bank and year respectively.

Net interest margin is represented by $y_{i,t}$, x is the matrix of explanatory variables presented in table 1. Some variables in matrix x are country specific, i.e. they are the same for all banks from a given country. The error term has two orthogonal components, fixed effects μ_i and idiosyncratic shocks $v_{i,t}$.

The combination of a relatively short time period, the use of a lagged dependent variable, bank specific fixed effects and possible endogeneity problems with bank specific variables make the use of least squares unfeasible as the estimates are not consistent. Using OLS with fixed effects and lagged dependent variable gives rise to dynamic panel bias (see Nickel, 1981; or Roodman, 2006) because the lagged dependent variable is correlated with error term by construction.⁶

Our data set has a large cross section and relatively small time dimension, so the problems mentioned above can be solved by using the Arellano and Bover (1995) system GMM estimator. This estimator uses lagged levels of dependent variable and orthogonal deviations of other endogenous variables as instruments. By using orthogonal transformations it allows for the use of a lagged dependent variable as an explanatory variable. Consequently, we estimate the equation (1) using Arellano and Bover (1995) system GMM estimator. We treat all bank specific variables from table 1 as endogenous and instrument them with their orthogonal transformations.

6 EMPIRICAL RESULTS AND ROBUSTNESS

The estimated model is

$$\begin{aligned} y_{i,t} &= \alpha y_{i,t-1} + x'_{it} \beta_{BS} + w'_{it} \beta_{BM} + z'_{it} \beta_M + \varepsilon_{i,t} \\ \varepsilon_{i,t} &= \mu_i + \tau_i + v_{i,t} \end{aligned} \quad (2)$$

⁶ Modifying an example of Roodman (2006), consider a company \times year panel and a firm that has a large negative temporary shock to its employment in one period. As a result fixed effect for this firm for all years will be lower. If the shock happens in time t , in time $t+1$ the lagged dependent variable is lower together with fixed effect. This positive correlation between error term and regressor violates the consistency assumption by inflating the coefficient estimate for lagged dependent variable.

The three vectors of variables represent the banks-specific ($x_{i,t}$), banking market-specific ($w_{i,t}$) and macroeconomic variables ($z_{i,t}$) described in table 1 and $y_{i,t}$ represents the net interest margin. Subscripts i and t are for i -th bank and t -th time period. Error term has a bank-specific (μ_i) and a time-specific part (t_i), which are controlled for in the estimation.⁷ Finally, the dot operator (.) represents element by element multiplication.

The estimation results are presented in table 2. Equation 2 is in the first step estimated for the whole sample period (specification 1). As a robustness test, we perform structural break tests by using the form of Chow test for GMM estimated equations, the Andrews and Fair (1988) test. The existence of a possible break is tested in 2007 and 2008. For both years the test finds insufficient evidence against hypothesis H_0 of parameter stability.⁸ To test for the possible breaks in some specific parameters we use a dummy variable named CRISIS which equals 1 in years 2008, 2009 and 2010 and zero otherwise.

The results of our baseline specification show that there is a relatively high persistence of net interest margin across time, as the coefficient with the lagged net interest margin is relatively high and significant (specification 1, table 2). This justifies the inclusion of lagged values of net interest margin in the estimated regressions.

All included macroeconomic indicators proved to be statistically significantly linked to the net interest margin, meaning that the environment in which banks operate significantly influences their performance. The link between GDP growth and net interest margin is positive, implying that periods of high growth can result in higher net interest margins due to more intense credit activity and better loan quality, as noted by Claey's and Vander Venet (2004) (it should be noted though that the p value for the GDP growth is 0.051 in specification 1 and that is insignificant at standard levels in specification 2). According to the presented results, the relatively big capital inflows that CEE countries experienced in the observed period (measured by current account deficit) had a positive effect on the cost of financial intermediation. The results show that higher capital inflows were linked with on average a lower net interest margin charged by the banks. In contrast, the correlation of general government debt and net interest margin is on average positive, implying that government debt accumulation increases the net interest margin, probably due to increased macroeconomic risks and the potential unsustainability. Inflation is positively correlated with net interest margin, in line with the findings in the studied literature, while the relation between interest rates and interest margins is negative.

⁷ The significance of time specific fixed effects was tested using the Wald test after GMM estimation. The significance of bank specific fixed effects was done applying the Hausman test after fixed effects regression. Both tests show strong evidence against the null hypothesis which states that the effects are equal to 0.

⁸ Test value for 2007 is 0.082 and for 2008 0.074, which is much less than the 5% or 10% critical value for Chi-squared distribution.

TABLE 2
Estimation results

Equation name	Specifications				
	1	2	3	4	5
Dependent variable	Net interest margin				
Net interest margin	0.5046	0.4411	0.5005	0.5842	0.4361
lagged (-1)	(0.0200)**	(0.0230)**	(0.0139)**	(0.0240)**	(0.0333)**
Cost to income ratio	-0.0060	-0.0047	-0.0045	-0.0071	0.0031
	(0.0016)**	(0.0015)**	(0.0016)**	(0.0017)**	(0.0016)
Total capital ratio	-0.0044	-0.0078	-0.0012	0.0108	0.0347
	(0.0032)	(0.0023)**	(0.0020)	(0.0039)**	(0.0091)**
Ratio of noninterest revenue to gross revenue	-0.0221	-0.0221	-0.0176	-0.0224	-0.0304
	(0.0027)**	(0.0026)**	(0.0025)**	(0.0028)**	(0.0031)**
Ratio of loans to customer deposits	0.0005	0.0014	0.0007	0.0020	0.0026
	(0.0006)	(0.0007)	(0.0004)	(0.0007)**	(0.0007)**
Ratio of reserves for impaired loans to impaired loans	-0.0245	-0.0310	-0.0276	-0.0244	-0.0404
	(0.0059)**	(0.0055)**	(0.0044)**	(0.0067)**	(0.0089)**
3 month money market interest rate	-0.1231	-0.0962			
	(0.0171)**	(0.0181)**			
GDP growth	0.0285	0.0250			
	(0.0146)	(0.0177)			
Inflation	0.1156	0.1138			
	(0.0184)**	(0.0174)**			
Current account	0.0848	0.0890			
	(0.0120)**	(0.0126)**			
Government debt	0.0285	0.0406			
	(0.0077)**	(0.0091)**			
Concentration	0.0227	-0.0005	0.0693	-0.1173	0.0039
	(0.0136)	(0.0131)	(0.0083)**	(0.0135)**	(0.0120)
Total capital ratio * Crisis		-0.1154	-0.1175	-0.2539	-0.1196
		(0.0159)**	(0.1174)**	(0.0205)**	(0.0140)**
Country spread				0.0048	0.0027
				(0.0005)**	(0.0006)**
Regulatory cost					-0.0060
					(0.0047)
Time dummies	Yes	Yes	Yes	Yes	Yes
Observations	823	824	858	640	506
Banks	152	152	153	131	122
Periods	12	12	12	10	8
Hansen J statistics	84.49	76.65	81.38	78.87	71.05
p value	0.1307	0.2738	0.2873	0.2707	0.2547

Notes: Robust standard errors are in brackets, all estimators are of panel GMM system types, Arellano and Bover (1995). Hansen J statistics and p value are for Hansen test for overidentifying restrictions.

** Significance at 5%; ** significance at 1%.*

Source: Own calculations.

Among the *bank-specific variables*, most of the coefficients have the expected signs. The cost to income ratio is negatively correlated with net interest margin, implying that relatively less efficient banks marked by higher cost to income ratio had higher net interest margins, as concluded by the most of the analysed authors (table A1). The ratio of non-interest income to gross revenue is significant and negative suggesting that banks with a higher share of non-interest income in their gross revenues charged lower margins for loans granted and collected additional revenue through various charges connected to credit activity. Reserves for impaired loans are significantly negatively correlated with net interest margin. This most probably stems from the fact that the banks are not allowed to accrue interest on bad loans. The only unexpected result in this specification is that the capitalization ratio is not significant. As many other researchers find evidence of this link (i.e. Claeys and Vander Vennet, 2008 for the CEE countries), we test for the potential structural break in this relationship. By interacting the aforementioned crisis dummy with total capitalization ratio we get specific estimates for the partial correlation of capitalization with net interest margin in the pre-crisis and crisis periods (specification 2, table 2). The results show that there is a structural change in the relationship between total capitalization ratio and net interest margin. The partial correlation between total capitalization ratio and net interest margin is negative and much higher in the crisis period, implying that increasing capital during the crisis can be very costly for the bank.

As robustness check we estimated several modified specifications. In the third specification macro variables are excluded (specification 3, table 2), while in the fourth specification all macro variables are replaced with the yield spread on government bonds acting as synthetic macro variable (specification 4). In this specification Slovenia and Estonia fall out of the sample because there are no comparable data on the yield spreads available for these countries. Also, the data for Slovakia have missing values in years 2009 and 2010. The fifth specification includes a regulatory cost variable (specification 5) that is also not available for Slovenia and Estonia and has missing values for the majority of countries in the period before 2003. In this shortened sample (specifications 4 and 5) the ratio of loans to customer deposits becomes significant, implying that banks that had fewer deposits in their funding mix charged a somewhat higher margin. Additionally, the coefficient on the total capitalization ratio in the pre-crisis period in these specifications (specifications 4 and 5) is positive, albeit the value is small. Finally, we should note the concentration ratio is significant in some specifications (specifications 3 and 4) but it is not robust as it changes signs.

Regarding additional regressors in specifications 4 and 5, two results seek special attention. Firstly, the yield spread variable included in specification 4 shows that increased country risk is linked to higher cost of financial intermediation. This corroborates results of other specifications where macroeconomic risks are on average positively correlated with net interest margin (specifications 1 and 2).

Secondly, the correlation of regulatory costs and net interest margin is negative (specification 5), however this relationship is not statistically significant.

We have also performed robustness test that splits sample in two parts: highly euroized economies (Bulgaria, Croatia, Estonia, Hungary, Latvia, Lithuania and Slovenia prior to eurozone entry) vs. others. The Andrews-Fair (1988) test statistic is 16.62, which is less than critical value of 37.65 for 5% significance level.

In sum, we can conclude that the estimation results showed to be robust in these tests. The statistical significance of the coefficients remains the same across specifications and their sizes do not change significantly.

7 CONCLUSION

In this research we analyzed the main net interest margin determinants of banks operating in Central and Eastern European countries from 1999 to 2010. We used the Arellano and Bover (1995) system GMM estimator which is robust to endogeneity problems and allows for the inclusion of a lagged dependent variable together with fixed effects to control for unobserved heterogeneity.

The results imply there have been several main drivers of decline in net interest margins in CEE in the pre-crisis period. Prior to 2008 the net interest margins declined primarily due to strong capital inflows, a stable macroeconomic environment (low inflation and low short term interest rates) and a fall in the share of nonperforming loans in the balance sheets of the banks. On the other hand, the economic boom (relatively high GDP growth rates) and rising government debt allowed banks to charge somewhat higher margins due to high demand for credit. In the crisis period, rapidly increasing government debt and the associated increase in macroeconomic risks together with declining capital inflows were propping up margins while other factors such as low demand (due to weak economic performance), higher capitalization and significantly increased share of non-performing loans pressured banks' margins down.

The results of the estimation also show that throughout the studied period increased efficiency in the CEE banking sector has led to lower margins. The important implication of this result for banks' management is that the banks which are not able to lower their costs (and margins) will lose their competitive position and subsequently market share.

When looking at the possible manoeuvring space for policy makers' actions that could affect the costs of financial intermediation and in turn interest rates, and therefore indirectly support economic activity our results indicate that a stable macroeconomic environment and significant capital inflows support lower net interest margins. On the other hand increasing government debt and associated macroeconomic risks are linked with higher margins. Finally, in line with general

opinion, pressures by the regulators to increase capital during the crisis will result in lower banks' operating profitability, which might make some banks business models unviable.

APPENDIX

TABLE A1

Literature overview

Research paper	Countries	Period	Methodology	Dependent variables	Independent variables	Main conclusions
Ho, T. J. S. and Saunders, A. (1981): <i>The Determinants of Bank Interest Margins</i> , Journal of Financial and Quantitative Analysis, 16(4), 581-600.	USA	q4/1976- q4/1979	Two step regression procedure	NIM	Implicit interest rate, opportunity cost of reserves, default premiums, size of transactions, market structure, interest rate volatility.	Interest margin is determined by four main factors – managerial risk aversion, size of transactions, degree of market competition and the variance of interest rates. Main determinants of net interest margin are interest rate volatility, as well as regulatory restrictions, such as minimum capital and liquid reserves requirements and implicit interest rates. There is a trade-off between assuring bank solvency in form of high capital/asset ratios and lowering the cost of financial intermediation.
Saunders, A. and Schumacher, L. (2000): <i>The determinants of bank interest rate margins: an international study</i> , Journal of International Money and Finance, 19(6):813-832.	Germany, Spain, France, Great Britain, Italy, Switzerland and USA	1988-1995	Two step regression procedure	NIM	Management's risk aversion, size of transactions, variance of the interest rate on deposits and loans, institutional costs, regulatory costs and credit risk exposure costs.	Interest spreads are positively correlated with operating costs and NPLs, as well as with the reserve requirements. Deterioration in macroeconomic indicators results with an interest spread increase.
Brock, P. L. and Rojas Suarez, L. (2000): <i>Understanding the behaviour of bank spreads in Latin America</i> , Journal of Development Economics, 63(1):113-134.	Argentina, Bolivia, Chile, Colombia, Mexico, Peru and Uruguay	Depending on a country, mostly first half of 1990s	Two step regression procedure	Interest spread	<i>First step</i> – NPLR, capital ratio, cost ratio, liquidity ratio, time effects. <i>Second step</i> – interest rate volatility, inflation rate, GDP growth rate.	

Research paper	Countries	Period	Methodology	Dependent variables	Independent variables	Main conclusions
Claeys, S. and Vander Vennet, R. (2008): <i>Determinants of Bank Interest Margins in Central and Eastern Europe: A Comparison with the West</i> , Economic Systems, 32, 197-216.	36 European countries – CEE countries, comparison with Western Europe	1994-2001	Single-step estimation procedure	NIM	<i>Country-specific bank market characteristics</i> – degree of concentration. <i>Country-specific macroeconomic conditions</i> – inflation, real GDP growth, real short term interest rate. <i>Bank-specific characteristics</i> – operational efficiency, capital adequacy, market share, loans/total assets, demand and savings deposits/total deposits. <i>Regulatory features</i> – degree of bank and enterprise reform in the CEE.	Important determinants of margins in Western and Eastern European countries are concentration, operational efficiency, capital adequacy and risk behavior. Foreign banks increased competition in the CEE countries. Interest margins in CEE reduced due to higher operational efficiency.
Maudos, J. and de Guevara, J. F. (2004): <i>Factors Explaining the Interest Margin in the Banking Sectors of the European Union</i> , Journal of Banking and Finance, 28, 2259-2281.	EU – Germany, France, the United Kingdom, Italy and Spain	1993-2000	Single-step estimation procedure	NIM	Market structure – Herfindahl index, Lerner index. Operating costs, degree of risk aversion, volatility of market interest rates, credit risk, interaction between credit risk and market risk, average size of operations/volume of loans. Implicit interest payments, opportunity costs of bank reserves, quality of management.	Reduction of net interest margins is compatible with a relaxation of the competitive conditions (increase in market power and degree of concentration), as this effect has been counteracted by lowering of interest rate risk, credit risk and operating costs.

Research paper	Countries	Period	Methodology	Dependent variables	Independent variables	Main conclusions
Athanasoglou, B. P., Delis, M. D. and Staikouras, C. K. (2006): <i>Determinants of bank profitability in the South and Eastern European region</i> , Bank of Greece, Working Paper No. 47, September.	Albania, B&H, Bulgaria, Croatia, FYROM, Romania and Serbia-Montenegro.	1998-2002	The least squares estimation with fixed effects and random effects models	ROA, ROE	<i>Bank-specific variables</i> – liquidity, credit risk, capital, operating expenses management, size, foreign ownership, market share. <i>Industry-related variables</i> – banking system reform, concentration. <i>Macroeconomic variables</i> – inflation, economic activity.	All bank specific variables significantly affect bank profitability (except liquidity). Financial reforms and improvement in the structure of the banks' aggregated balance sheet are important determinants of their profitability. Concentration positively affects bank profitability. When looking at macroeconomic variables, inflation has a strong effect on profitability, while the impact of real GDP per capita fluctuations is not that significant.
García-Herrero, A., Gavilá, S. and Santabarbara, D. (2009): <i>What explains the low profitability of Chinese banks</i> , Banco de España, Working Paper 0910.	China	1997-2004	Generalized Method of Moments (GMM) estimator technique following Arellano and Bover (1995)	Pre-provision profit, ROA	<i>Bank-specific variables</i> – loan growth, loans/assets, deposits/assets, equity/assets, bank technical inefficiency, foreign capital, listed banks, recapitalized banks, market share on assets, concentration, real interest on loans, maximum spread. <i>Macroeconomic variables</i> – real GDP growth, inflation, interest rates volatility. Dummies for different types of Chinese banks.	Main causes of low profitability are poor asset quality, low efficiency and scarce capitalization, as well as the scarcity of private-ownership and concentration of assets in a few large state-owned banks.

Research paper	Countries	Period	Methodology	Dependent variables	Independent variables	Main conclusions
Schwaiger, M. S. and Liebig, D. (2009): <i>Determinants of the Interest Rate Margins in Central and Eastern Europe</i> , Oesterreichische Nationalbank, Financial Stability Report No. 14.	CEE EU member states and Croatia	2000-2005	Fixed effects model using the within group estimator for dealership model	NIM	Risk aversion, interest rate risk, credit risk, interaction of credit and interest risk, operating costs, average size of operations, competitive structure, payment of implicit interest rates, importance of noninterest revenues, economic conditions, ownership structure.	Credit risk is the most important driver of interest margins in CEE, while the impact of interest rate risk is limited. Lower operating costs, increased efficiency, positive economic developments and financial deepening result with lower net interest margins. Foreign ownership positively affects interest margins, while state ownership does not make a difference.
Horváth, R. (2009): <i>Interest Margins Determinants of Czech Banks</i> , Institute of Economic Studies, Charles University in Prague, Working Paper 11/2009.	Czech Republic	2000-2006	Arrelano-Bond dynamic panel data framework	NIM	<i>Bank-specific variables</i> – fee income/assets, capital adequacy, total loans/assets, administrative costs/assets, size. <i>Market structure</i> – Herfindahl index. <i>Macroeconomic conditions</i> – inflation, real GDP growth.	Lower interest margins are associated with higher efficiency, price stability, size of the bank and higher capital adequacy.

Research paper	Countries	Period	Methodology	Dependent variables	Independent variables	Main conclusions
Kasman, A., Tunc, G., Vardar, G. and Okan, B. (2010): <i>Consolidation and commercial bank net interest margins: Evidence from the old European Union members and candidate countries, Economic Modelling</i> 27, 648-655.	New EU members from the CEE and candidate countries	1995-2006, 2 sub-periods: consolidation (1995-2000) and post-consolidation (2001-2006)	Single-step estimation approach	NIM	<i>Bank-specific variables</i> – operating cost, credit risk, default risk, capital adequacy, implicit interest payments, size, deposit to equity ratio and managerial efficiency. <i>Country-specific market characteristic</i> – degree of concentration, Lerner index. <i>Country-specific macroeconomic conditions</i> – CPI, economic growth, stock market capitalization/GDP.	NIM is negatively related to size and managerial efficiency in both sub-periods. Merger and acquisition improve banks' efficiency while economies of scale contributes to lowering the interest rate spread. Macroeconomic variables proven to be statistically insignificant in the second sub-period, probably implying that the differences among countries decreased during the convergence process.
Hasan Khan, M. and Khan, B. (2010): <i>What Drives Interest Rate Spreads of Commercial Banks in Pakistan? Empirical Evidence based on Panel Data, SBP Research Bulletin</i> , Vol. 6, No. 2.	Pakistan	1997-2009	Single-step estimation procedure	Banking spread (returns on avg earning asset – cost of avg funds)	<i>Bank-specific variables</i> – non-interest/total income, share of non-remunerative deposits, administrative expense/total expense. <i>Industry-specific variables</i> – Herfindhal Index. <i>Macroeconomic factors</i> – real GDP growth, interest rate.	Main determinants of banking spreads are cost of funding, operating expenses and possibility to generate income from non-core business activities. Market concentration and macroeconomic variables positively influence banking spreads.

Research paper	Countries	Period	Methodology	Dependent variables	Independent variables	Main conclusions
Dietrich, A. and Wanzenried, G. (2011): <i>Determinants of bank profitability before and during the crisis: Evidence from Switzerland</i> , Journal of International Financial Markets, Institutions and Money, 2, 307-327.	Switzerland, 372 commercial banks	1999-2009; 2 subperiods: pre-crisis (1999-2006), post-crisis (2007-2009)	Generalized Method of Moments (GMM) estimator technique following Arellano and Bover (1995)	ROAA, ROAE, NIM	<i>Bank specific determinants</i> – equity/total assets, cost/income, loan loss provisions/total loans, yearly growth of deposits, difference between bank and market growth of total loans, bank size, interest income share, funding costs, bank age, bank ownership, nationality. <i>Macroeconomic and industry-specific characteristics</i> – effective tax rate, real GDP growth, term structure of interest rates, Herfindahl index.	Profitability is primarily determined by five factors: operational efficiency, growth of total loans, funding costs, business model and the effective tax rate. Prior to the crisis ownership was irrelevant for banks' profitability, but after the crisis state-owned banks turned out to be more profitable than privately owned banks. Market structure is important prior the crisis, but not after.
Männasoo, K. (2012): <i>Determinants of Bank Interest Spread in Estonia</i> , Working Paper Series 1/2012, Eesti Pank.	Estonia	December 1998 – June 2011	Two step regression procedure	Interest spread	<i>Pure spread</i> – market structure, interest rate volatility risk, risk aversion. <i>Residual spread</i> – inverse efficiency, liquidity, credit risk, management quality, fees/interest earning assets, deposit guarantee payment costs/total deposits, foreign owned capital in the bank, non-affiliation dummy, loan portfolio dummies, bank dummies.	Interest spread is primarily determined by the level of risk aversion and market structure of the banking sector, while the impact of interest rate volatility is modest.
Saad, W. and El-Moussawi, C. (2010): <i>The Determinants of Net Interest Margins of Commercial Banks in Lebanon</i> , Journal of Money, Investment and Banking, Issue 23.	Lebanon	2000-2010	Least squares	NIM	Market structure, credit risk, off-balance sheet activities, operational costs, capital ratio, opportunity cost, bank size, economic growth rate, inflation rate.	The main determinants of net interest margin are: opportunity cost, credit risk, bank capitalization, market structure, off-balance, size and economic growth.

TABLE A2
Descriptive statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque- Bera	Probability
Net interest margin (%)	3.83	3.45	12.63	-0.08	1.89	1.46	6.35	366.08	0.0
Cost to income ratio (%)	63.77	61.00	217.65	15.60	21.67	2.04	12.04	1,819.18	0.0
Ratio of noninterest revenue to gross revenue (%)	37.08	36.68	272.46	-364.77	24.86	-3.00	57.26	228,471.40	0.0
Total capital ratio	14.59	13.19	72.37	6.80	6.16	4.34	31.92	16,863.24	0.0
Ratio of loans to customer deposits	115.45	96.87	950.52	5.65	85.05	4.00	29.59	14,262.04	0.0
Ratio of reserves for impaired loans to impaired loans	4.09	3.19	27.68	0.10	3.43	2.27	11.83	1,824.88	0.0
3 month money market rate	6.07	4.90	50.78	1.31	4.90	5.40	44.62	34,201.97	0.0
Concentration	53.98	53.92	87.01	35.92	12.26	0.37	12.18	22.40	0.0
GDP growth	2.71	4.20	11.20	-17.70	5.64	-1.56	5.71	315.33	0.0
Inflation	4.96	4.00	45.70	-1.20	4.69	4.45	34.11	19,364.50	0.0
Current account	-5.26	-3.80	6.50	-21.60	6.52	-0.71	2.83	37.77	0.0
Government debt	32.99	29.15	81.30	9.00	16.76	0.77	3.02	43.80	0.0
Regulatory costs	16.85	13.34	44.25	6.24	9.32	1.09	3.46	354.51	0.0
Country spread	176.03	126.57	691.85	-15.33	158.46	1.19	3.99	122.88	0.0

Source: Own calculations.

TABLE A3

Panel unit root test results

Variable name	Levin, Liu & Chu (2002)	Im, Pesaran and Shin (2003)
Net interest margin (%)	I(0)	I(0)
Cost to income ratio (%)	I(0)	I(0)
Ratio of noninterest revenue to gross revenue (%)	I(0)	I(0)
Total capital ratio	I(0)	I(0)
Ratio of loans to customer deposits	I(0)	I(0)
Ratio of reserves for impaired loans to impaired loans	I(0)	I(1)
Concentration	I(0)	I(0)
3 month money market rate	I(0)	I(0)
GDP growth	I(0)	I(0)
Inflation	I(0)	I(0)
Current account	I(1)	I(0)
Government debt	I(0)	I(1)
Growth rate of gross loans	I(0)	I(0)
Regulatory cost	I(0)	I(0)

Source: Own calculations.

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Budget perspective in Croatia after accession to the European Union

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Article**

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Abstract

Upon accession to the European Union, the New Member State's budget undergoes significant structural changes due to the appearance of new categories of revenues and expenditures. The aim of this paper is to estimate the possible effects of Croatian membership in the EU on changes in the structure and size of budget revenues and expenditures upon the country's accession to the EU in the second half of 2013, as well as to indicate the possibilities for utilization of EU funds in the new financial perspective up to 2020. It is shown that in 2013 Croatia might realize a positive net financial position in transactions with the EU budget in the amount of approximately 0.28% of GDP, i.e. EUR 136 m. The total net financial position of Croatia due to EU accession, which includes some additional costs and benefits like different harmonization and the need for project co-financing at state and local levels, is also positive in 2013 and amounts to approximately 0.15% of GDP or equivalently EUR 72 m. Total amount of all funds that Croatia might receive in the new EU financial perspective covering the period from 2014 to 2020 amounts to EUR 6.34 bn, whereby annual amounts increase from EUR 0.7 bn in 2014 up to EUR 1.2 bn in 2020. By using exponential regression analysis it is estimated that in 2020 Croatia should be a net recipient of funds from the EU budget in total amount of 1.72% of GDP, i.e. EUR 1.13 bn.

Keywords: Croatia, European Union, fiscal policy, membership in the EU, net effects of accession, EU funds, New Member States

1 INTRODUCTION

The European Union (EU) continues preparation for its further enlargement. The accession negotiations with Croatia were closed on 30 June 2011, which allowed for the signature of the Accession Treaty on 9 December 2011. At a referendum held on 22 January 2012, 66.27% of Croatian voters supported Croatian accession to the European Union. Following the ratification procedure in all EU Member States and Croatia, accession is foreseen for 1 July 2013 (Delegation of the European Union to the Republic of Croatia, 2012).

The EU membership generally brings an additional fiscal pressure on a Member State. It comes from the necessity to contribute to the EU budget, co-finance projects financed by the EU funds, pre-finance some of the EU transfers during first period of membership, as well as to continue implementation of the *acquis communautaire* in some costly areas such as environmental protection, infrastructure, border control and public administration (Antczak, Dabrowski and Gorzelak, 2004).

Building the administrative infrastructure in the pre-accession period is highly significant, not only for better coordination and management of pre-accession funds, but also for adequate preparation for use of the structural and cohesion related funds of the EU after membership status has been acquired. Institutions

and human potentials included in processes of programming, implementation and evaluation of the EU funds are a key determinant of every country's absorption capacity and an indicator of preparedness for the effective usage of available funds.

Absorption of the EU funds generally depends on three main determinants, and these are: macroeconomic, financial and administrative, i.e. institutional absorption capacity. Macroeconomic absorption capacity is important as a country is not able to provide a sufficient number of productive investment opportunities to absorb the transfers in an efficient way if these transfers are high in relation to the national economic performance. Administrative absorption capacity is a decisive factor of success for the implementation of European structural policies. Financial absorption capacity defines the extent to which the supported regions are able to co-finance the projects, which becomes more difficult with a higher ratio of EU payments to GDP (Osterloh, 2010).

Financial absorption capacity, which is defined as the capability to co-finance the EU programs and projects, to plan and guarantee the government contribution in a multiannual budget and combine the contributions of the different partners included in the whole process, is directly linked to fiscal policy. This means that each accession country has to take care of the potential costs of the accession process in advance.

The annual average of estimated total costs before accession to the EU amounted to 3.2% of GDP in the case of the EU New Member States (i.e. the EU-10), of which 1.6% of GDP was averagely financed from the general government budget, but this amount varies from the minimum of 0.4% of GDP in the case of Poland to the maximum of 3.6% of GDP in Bulgaria (Antczak, Dabrowski and Gorzelak, 2004; Hallet, 2004). Even after accession to the EU, the New Member States incurred high fiscal costs for infrastructure development, as well as for public administration reform. The average share of these expenditures in GDP was estimated at 2-3% on an annual level in the eight countries that entered the EU on 1 May 2004 (Antczak, Markiewicz and Siwinska, 2006). Hence, the accession process leads to a negative net fiscal impact on the general government budget, which varies according to the degree of harmonization and can amount to as much as 3% of GDP in the first years after member status is obtained (Antczak, 2003).

The main objective of this paper is to estimate the possible effects of the Croatian accession to the EU on the structure and size of the revenue and expenditure of the Croatian budget upon the country's accession to the EU, i.e. in the second half of the year 2013, as well as to show the possibilities for the utilization of EU funds in the new financial perspective up to 2020¹. A significant part of the analysis, with

¹ Throughout the text budget means the general government budget in every context, unless explicitly otherwise stated.

some additional assumptions and corrections, will draw on the historical experiences of the New Member States, and the main sources of information used in the analysis are the financial reports of the European Commission on the realized budget revenues and expenditures in the period 2000 to 2010 (European Commission, 2011a; 2011b). However, it is important to stress that the actual and total effects of the EU accession on the Croatian budget cannot be exactly and fully assessed, since they depend on many internal and external factors. Thus, the analysis in this paper can provide only an insight into the size and expected direction of the effects of accession. Therefore, the research results should be interpreted with caution.

The introduction is followed by an overview of the existing system of EU budget revenues and expenditures. Since significant changes in EU budget financing in the period from 2014 to 2020 are envisaged, the third part of the paper provides a short overview of suggested reforms within a multiannual financial framework. The fourth part of the paper deals with qualitative and quantitative estimates of net financial effects of Croatian accession to the EU in 2013. The fifth part shows the mid-term perspective of Croatia in the period from 2014 to 2020, based on experiences of the EU New Member States and publicly available information on potential cash flows from the EU budget. After that follows the conclusion.

2 EXISTING SYSTEM OF REVENUES AND EXPENDITURES OF THE EU BUDGET

Upon accession to the EU, significant changes arise in the structure of budget revenues and expenditures, since part of a Member State's revenue is directly transferred to the EU budget according to standard mechanisms, while at the same time some new categories of revenues and expenditures appear in the budgets of Member States². In the following text a synthesis of the main actual categories of revenues and expenditures will be given, while for the details on these budgetary items one may consult the existing literature (see for instance Kandžija and Cvečić, 2011; European Commission, 2011a; Cuculić, Faulend and Šošić, 2004; Sopek, 2011). This system of revenue and expenditure categories is valid only until the end of the year 2013, i.e. in the case of Croatia it will be in force only in the first half year of EU membership. In the new financial perspective covering the period from 2014 to 2020 certain changes in some revenue and expenditure categories are proposed, and they will be examined in chapter three. However, the financial perspective for the period 2014-2020 has still not been adopted, so it is uncertain whether these changes will be put in place.

Before, but also after, accession to the EU, countries are obligated to harmonize their tax and customs systems with the EU standards, which certainly leads to positive (an increase in budget revenues of a Member State) or negative (a decrease in budget revenues of a Member State) effects for the budget, depending on

² Revenue of the EU budget actually means budget expenditure from the perspective of the Member States.

the level of harmonization of an accession country, i.e. Member State. However, besides the effects that joining the EU has on the current budget revenue (customs, VAT, excise duties), new categories of revenue appear as a result of transfers from the EU budget on the basis of participation in common EU policies. The positive side of getting transfers from the EU budget is manifested in a reduction of expenditure for financing the existing aid systems because the funds from the EU budget will be replaced with national funding (substitution effect).

Transfers from the EU budget can be divided into transfers that are not related to projects, so their amount automatically becomes the revenue of a Member State budget, and into transfers that depend on the absorption capacity of an individual Member State, which is primarily measured by administrative absorption capacity as a key determinant of the successfulness of implementation of EU structural policies, as well as financial absorption capacity as a measure of capability to co-finance projects at both state and local levels.

In the group of transfers not related to projects belong direct aids, agricultural market-related expenditure and transfers on the basis of internal policies. Direct support schemes for farmers not related to projects come from the Agricultural Fund, or more precisely from the part of it for guarantees, and they constitute an important part of the transfers from the EU budget. These mean direct aids (the largest share), refunds for the export of agricultural products to third countries, intervention measures for regulating the agricultural markets (for wine, fruit and vegetables, milk, sugar, etc.) and others. Transfers by means of internal policies include a variety of EU programs aimed at increasing the co-operation between Member States in the conduct of common policies, and these are for instance programs for investment in citizenship, freedom, security, justice, education, environmental protection, research, energy efficiency and so on. The main reason for the existence of these programs is that the EU considers that it is much better to implement common policies through various organizations, associations and legal entities, rather than by public authorities only.

In the group of transfers that depend on projects belong transfers from the Structural Funds, the Cohesion Fund and Rural Development Funds. Structural Funds have three main objectives: promotion of the development and structural adjustment of regions whose development is lagging behind, economic and social assistance to areas with structural difficulties, and assistance to adaptation and modernization of policies and systems for education, training and employment. Structural Funds cover exclusively regions whose GDP per capita is below 75% of the EU average and projects are co-financed by the EU up to maximum 75% of the eligible costs amount. Countries eligible for cohesion funding are those EU Member States with a gross national income lower than 90% of the EU average. The Cohesion Fund finances action on the trans-European transport networks, priority projects of special interest, as well as some other transport and

environmental activities. Projects are co-financed by the EU up to maximum 85% of the amount of the eligible costs. Rural Development Funds mean financing from the European Agricultural Fund for rural development approved based on project plans, by which improvement in the consistency, transparency and clearness of rural development financing is fostered.

As well as those stated above, there is also a third group of transfers from the EU budget including other pre-accession assistances, special arrangements and budgetary compensations, but as compared to the other two components, this one has a relatively small significance in total EU budget (1.5% in 2004, 0.4% in 2007, and 0% in 2010). Nevertheless, they were highly significant in the allocated amounts of New Member States in the first years of EU membership. These compensations are introduced in order to prevent New Member States becoming net contributors to the EU budget in their first years of the EU membership. So, for instance, in 2004 compensations had an average share of 35% of total allocated funds to New Member States, with 73% in the case of Cyprus, 70% in the case of Malta, 41% in the case of Czech Republic and 37% in the case of Slovenia. If these amounts are enlarged by other pre-accession assistances, these two components together represent an average of 55% of total allocated funds to EU New Member States in 2004 (European Commission, 2011b).

In addition to the above mentioned items that impact the revenue side of the EU budget (at the same time some of them also impact the expenditure side due to the need for project co-financing), there are also some new expenditure categories of EU Member States. Own resources of the EU budget are automatically transferred from the Member States' budgets into the EU budget and for these revenues no individual national authority decision is necessary. Own resources of the EU budget are: Traditional Own Resources (TOR), revenue from Value Added Tax (VAT-based revenue) and revenue based on Gross National Income (GNI-based revenue). A special part of the EU's own resources consists of various corrections, of which the most important is the UK correction³.

Traditional Own Resources consist mainly of customs, agricultural duties and sugar levies, whereby 75% of all collected revenue on this basis is automatically transferred to the EU budget, while the remaining part of 25% is kept by a Member State to defray the costs of their collection⁴. Hence, it can be concluded that there is a double loss for a Member State government budget, which includes direct loss due to automatic transfer to the EU budget, as well as indirect loss due to harmonization with the EU customs tariff structure.

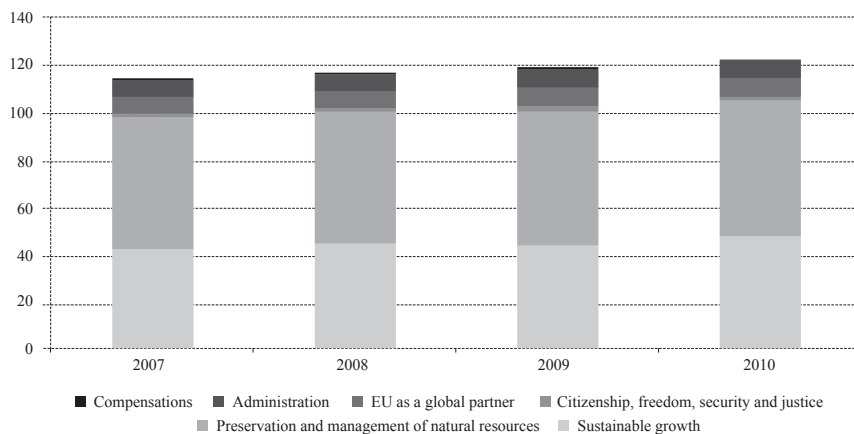
³ As well as the correction for the United Kingdom, there are also correction mechanisms for other largest net contributors – Austria, Germany, Netherlands and Sweden. These corrections are considered in text within specific component of EU budget revenue to which they relate (within UK correction, VAT-based revenue and GNI-based revenue).

⁴ Since the retained amounts of 25% of total collected Traditional Own Resources do not correspond to actual collection costs, this model can be considered a hidden correction mechanism (European Commission, 2011g).

VAT-based revenues are calculated as a predefined percentage of a VAT base, which has to be harmonized with EU rules. Still, in order to prevent disproportional payments into the EU budget, the VAT base is capped by 50% of a Gross National Income⁵. However, although disproportioned payment based on VAT is partly restrained, it has not been fully eliminated. According to European Commission (2011g), the size of the VAT base is not in practice proportional to Member States' GNI. Some of the richest Member States, such as Luxembourg and to a lesser extent Ireland, are subject to capping and thus see their contributions reduced. Since 1 January 2007, a uniform rate of 0.3% has been applied on the VAT base or 50% of the Gross National Income, whereby special exceptions are defined for Austria (0.225%), Germany (0.15%), Netherlands (0.1%) and Sweden (0.1%).

FIGURE 1

EU budget expenditure by main categories in the period 2007-2010 (in bn euro)



Source: Author's calculation based on European Commission (2011b).

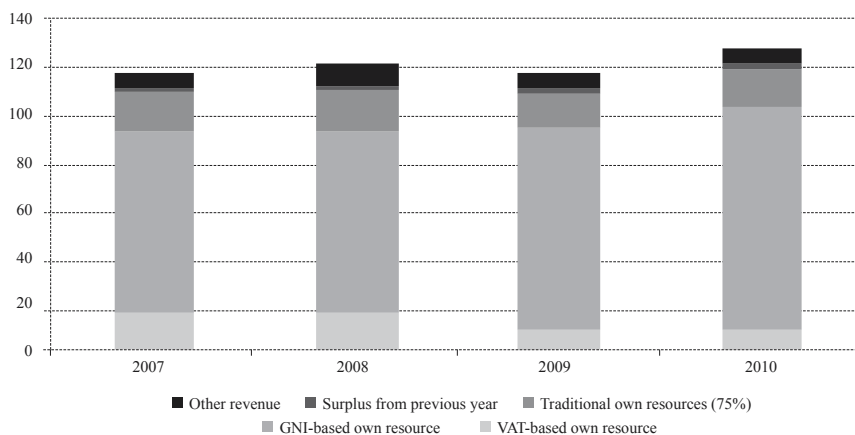
GNI-based revenues are definitely the biggest burden for the national budget of EU Member States. The total revenue of the EU budget on the basis of GNI is calculated as the difference between total EU budgetary expenditure and revenue collected on other bases. In other words, this revenue patches holes in the EU budget and every EU Member State pays in its own part on the basis of the relative size of its GNI. A special privilege of a lump sum deduction of the GNI-based revenue has been approved to Netherlands and Sweden, amounting to EUR 605 bn per annum for the Netherlands and EUR 150 bn per annum for Sweden, calculated at constant prices for 2004.

⁵ If the VAT base of a country exceeds 50% of the GNI, the applicable rate is 0.3% on 50% of the GNI. This limitation was introduced because it was shown that the consumption of less prosperous countries, and therefore the VAT base, record higher shares of the country's GNI. Without this restriction, relatively less developed countries would pay out of proportion to their contributive capacity into the EU budget (European Commission, 2011a).

An additional cost to a Member State budget is also the UK correction. Namely, after joining the EU the United Kingdom became the largest contributor to the EU budget, mostly thanks to the low level of transfers from the Common Agricultural Policy (CAP) due to its relatively small agricultural sector. Thus, since 1985 the United Kingdom has been refunded a part of its payment into the EU budget in the amount of 66% of its net position. The loss of this revenue is made up together by all other Member States, with the provision that Germany, Netherlands, Austria and Sweden (the largest net contributors) bear only one quarter of the share.

FIGURE 2

EU budget revenue by main categories in the period 2007-2010 (in billion euro)



Source: Author's calculation based on European Commission (2011b).

Total EU budget expenditures amounted to EUR 122 bn in 2010. The largest part relates to categories Preservation and Management of Natural Resources (46%) and Sustainable Growth (40%). Lower shares in total expenditure represent the categories EU as a Global Partner (6%) and Administration (6%). Preservation and Management of Natural Resources mainly consists of market-related expenditure and direct aids (78%) and Rural Development Funds (20%). The Sustainable Growth category is divided into two subcategories. The first one is Cohesion for Growth and Employment, representing 76% of all Sustainable Growth funds, and this category includes Structural Funds (79% of Cohesion for Growth and Employment funds) and the Cohesion Fund (21%). The other category within Sustainable Growth is Competitiveness for Growth and Employment with share of 24%, and this category includes various programs for fostering research activities, innovation, lifelong learning and social policies development. EU budget expenditures have been recording a continuous increase in each year. Total expenditures in 2010 are 7% higher than those in the year 2007, 22% than those of 2004 and 46% higher than the total expenditure recorded in 2000. The highest annual increase of as much as 11% was recorded in 2004, primarily due to the

enlargement of the EU by the inclusion of the New Member States. The highest shares of the EU budget funds in 2010 were allocated to Spain (10.8%), France (10.7%), Germany (9.7%) and Poland (9.7%). However, an analysis of the paid amount of funds from the EU budget with regard to Member States' GNI shows that the largest shares in 2010 were received by Lithuania (5.9%), Estonia (5.8%), Luxembourg (5.2%) and Latvia (4.6%).

Total EU budget revenue in 2010 amounted to EUR 128 bn, of which the largest part relates to GNI-based revenue (71%). Traditional Own Resources represented approximately 12% and VAT-based revenue about 10% of total EU budget revenue. Various corrections that represent significant shares in Member States' budgets are irrelevant in the overall EU budget, since in the overall EU budget only their net position is recorded (payments of Member States into the EU budget minus payments from the EU budget, primarily to the United Kingdom). Unlike the EU budget expenditures that have been constantly recording an increasing trend, EU budget revenues have had a somewhat different situation, mainly resulting from the impact of the global crisis. The impact of the crisis was best seen in a comparison of 2009 and 2008, since VAT-based revenue decreased by 33%, and Traditional Own Resources by 16%. Subsequently, this led to an increase in GNI-based revenue by 10%. The largest contributors to the EU budget in 2010 were Germany (20.0%), France (16.4%), Italy (12.9%) and United Kingdom (12.3%)⁶. With respect to GNI, the largest contributor in 2010 was Belgium, which paid 1.34% of its GNI into the EU budget.

3 NEW EU FINANCIAL PERSPECTIVE FROM 2014 TO 2020

For the period 2014-2020 new EU financial perspective is envisaged; it is described in the Multiannual Financial Framework named "A Budget for Europe 2020" (European Commission, 2011d; 2011e) as well as in the whole set of supplements and amendments of this document (see for instance European Commission, 2011f; 2011g). These documents propose numerous changes in the financing policies of the EU budget, i.e. its revenue and expenditure. The main changes in the period from 2014 to 2020 envisaged by the new financial perspective proposal, actual at the moment of writing this paper, will be described below. However, new financial perspective proposal is still uncertain; indeed, it is highly unlikely that some of the proposals will in the end be adopted and applied in the new financial perspective.

3.1 PROPOSED CHANGES IN THE EU BUDGET REVENUES

In the financing of the EU budget in the period 2014-2020 a reform of the own resources system is proposed, by which current VAT-based own resources would be significantly changed and new own resources based on a part of the proceeds of a financial transaction tax (FTT) would be created. The purpose is not to increase the overall EU budget, but to contribute to national budgetary consolidation

⁶ Without correction, the share of United Kingdom would amount to 15.3% of total payments into the EU budget.

efforts by reducing direct contributions from Member State budgets. The changes proposed will also simplify the existing contributions to the budget and increase the link between EU policies and EU financing (European Commission, 2011h).

Financial sector taxation would constitute a new revenue stream, therefore potentially reducing the existing contributions from Member States, giving extra room for maneuver to national governments and contributing to general budgetary consolidation efforts. A financial transaction tax that could be collected at the EU level would also reduce the *juste retour* problems observed in the current financing system. An EU initiative in this area would constitute a first step towards the application of an FTT at the global level. The financial transaction tax model proposed by the European Commission would consist of two different rates, whereby trading with bonds and shares would be taxed at the rate of 0.1%, while for other financial instruments (derivative products) a rate of 0.01% would be applied (European Commission, 2011g). By the amended proposal for a Council Regulation laying down implementing measures for the system of own resources of the European Union it is envisaged that two thirds of a future financial transaction tax would be used for financing of the EU budget, while the resting part would be kept in Member State budgets (European Commission, 2011j). This tax raises many debates and disagreements among Member States and its final application is therefore still uncertain, since for the adoption of this taxation model a consensus of Member States is needed.

The biggest opponent to the introduction of the financial transaction tax is the United Kingdom whose House of Lords in its report claims that there is a significant risk that financial institutions would relocate outside the EU if the FTT is introduced. It has been suggested that the FTT may be adopted by some or all Euro Area Member States, or that a tax of a similar kind to the UK Stamp Duty might be pursued (House of Lords, 2012). Also very much opposed to the introduction of financial transaction tax is Sweden, which introduced similar tax in 1984. This tax did not prove to be successful, so in 1991 Sweden decided to repeal it. Apart from the United Kingdom and Sweden, Luxembourg, Netherlands and Malta also argue for the rejection of the proposal for the introduction of FTT. Ireland is against the mentioned proposal in case it is applied to some EU Member States only. On the other hand, the biggest champions of the introduction of FTT are Germany and France, stressing that it could help in distributing the crisis burden to financial institutions, but could be also used for financing of banks seeking bailouts. Apart from Germany and France, positive opinions on the introduction of the FTT are also voiced by Austria, Belgium, Portugal, Slovenia, Spain, Greece, Slovakia and Estonia.

For the calculation of new VAT-based own resources it has been proposed to employ a simple method by which a certain share of funds collected by the national tax administration would be transferred to the EU budget. On the basis of the VAT

returns, the tax administrations would apportion the VAT receipts between the VAT stemming from the standard rate and the reduced rates and would then exclude from the former, on the basis of national accounts data, consumption data or other sources, the VAT stemming from the few transactions not subject to the new VAT resource. Unlike the existing VAT-based own resource, the revenue stream would not be capped and would not be the result of the current complex statistical calculations and adjustments to obtain a purely theoretical VAT base. It would result from the actual new VAT resource paid by all the European final consumers and then collected by the national tax authorities. Moreover, this system would closely link EU policies for VAT with EU budget policies (European Commission, 2011g). EU budget revenue would increase in the case of a broadening of a national VAT base, which can result from broadened list of taxable goods and services, i.e. from reduced exemptions in VAT system, or due to increased consumption. Moreover, EU budget revenue would increase also in the case of a reduction in the number of deliveries currently taxed by zero or reduced rates, since a standard VAT rate would then be applied to these deliveries of goods and services and in this case these VAT revenues would be subject to the application of a taxation rate for transfer to the EU budget. According to European Commission (2011i) the tax rate applied should not exceed 2%, and it is proposed that there should be the application of a tax rate of 1% of the net value of supplies of goods and services, intra-Community acquisitions of goods and importation of goods subject to a standard rate of VAT in every Member State determined according to Union rules (European Commission, 2011j). Figure 3 shows realized VAT-based revenue (% of GNI) with regard to GDP per capita PPS in 2009 and estimated VAT-based revenue according to new EU budget proposal.

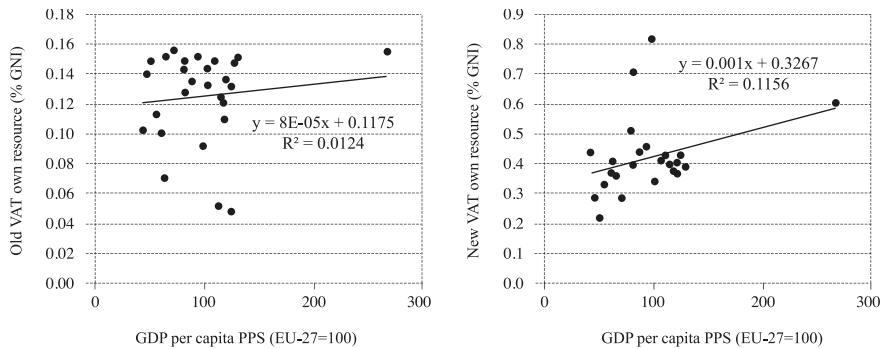
Revenue estimates of European Commission (2011i) for a single-rated VAT resource applied to a harmonized basis show that the VAT burden in Cyprus, Malta and Luxembourg would clearly be higher than the average, while Latvia, Slovakia and Romania would benefit from lower VAT charges. Figure 3 shows that the introduction of new VAT-based own resource would only partially reduce disproportional payments into the EU budget with regard to the development level of a Member State. While the average VAT-based own resource increase compared to the current model on the level of EU-27 should amount to approximately 267%, the highest increase is estimated in Netherlands and it amounts to 722% (from 0.05% to 0.39% of GNI). As there is a strong correlation between VAT bases and GNI, it can be expected that a new VAT resource could bring stable and sufficient revenue for a budget evolving broadly in line with the GNI of Member States (European Commission, 2011i).

Apart from the above mentioned new categories of EU budget revenue, some changes in existing revenue categories have also been initiated, primarily related to simplification of correction mechanisms by replacing the current complicated system with a simple system of lump sum reductions to the GNI-based contributions

paid by Member States. The proposed reform is based on the Fontainebleau principles agreed in 1984, whereby any Member State sustaining a budgetary burden which is excessive in relation to its relative prosperity may benefit from a correction at the appropriate time (European Commission, 2011h). As well as changes in corrections, a change of Traditional Own Resources policy is also envisaged. In view of the proposal to incorporate the correction mechanisms into lump sums, the retention should be restricted to 10%, instead of 25%, which is also in line with the system in place until 2000 (European Commission, 2011i).

FIGURE 3

Realized VAT-based revenue (% of GNI) with regard to GDP per capita PPS in 2009 and estimated VAT-based revenue according to a new EU budget proposal



Source: Author's calculation based on European Commission (2011b, 2011i) and Eurostat.

TABLE 1

Estimated changes in structure of EU budget financing (in billion euro and % of own resources)

	Budget proposal 2012		2020	
	Billion euro	% of own resources	Billion euro	% of own resources
Traditional own resources	19.3	14.7	30.7	18.9
Member States' contribution	111.8	85.3	95.0	58.4
VAT-based own resources	14.5	11.1	29.4	18.1
GNI-based own resources	97.3	74.2	65.6	40.3
New own resources	–	–	37.0	22.7
Financial transactions taxation	–	–	37.0	22.7
Total	131.1	100.0	162.7	100.0

Source: European Commission (2011k); author's adjustment.

According to estimates of European Commission (2011k), new proposal of EU budget financing would significantly impact the structure of own resources. It

shows the shift from the existing national contributions towards the new own resources. Unlike the current model, by which a major part of revenue is transferred to the EU budget based on a Member State's GNI (GNI-based revenue and partially VAT-based revenue), the new own resources system would decrease Member States' contribution based on GNI to around 40%. Taxation of financial transactions would constitute almost one fourth of EU budget revenue. Moreover, in the total revenue structure the contribution of Traditional Own Resources would also increase from approximately 15% to 19% (increase by 29%), and the contribution of VAT-based own resources would go up from 11% to somewhere in the region of 18% (increase by 63%).

3.2 PROPOSED CHANGES IN THE EU BUDGET EXPENDITURES

Items of proposal of the EU budget expenditures are always expressed in parallel in two different ways, i.e. showing separately *commitment appropriations* and *payment appropriations*. The main reason for such demonstration of budget planning is that an increasing part of expenditures relates to multiannual projects, so the payments are usually made over several years. Hence, commitment appropriations represent the total costs in the current financial year of the legal obligations entered into for operations to be carried out over more than one financial year. This type of appropriation constitutes the upper limit of expenditure that can be committed during the financial year. On the other hand, payment appropriations cover expenditure arising from commitments entered into during the current financial year or preceding years, but these do not include amounts related to a specific year that will be payable in some later period.

According to European Commission (2011h), the overall commitment ceiling proposed by the Commission for the 2014-2020 period (EUR 1,025 bn) is around 3% higher than EU budget expenditures appropriated for the period 2007-2013 (EUR 994 bn). With regard to Gross National Income, the total amount of commitment appropriations for the period 2014-2020 will be lowered to 1.05% of expected EU GNI, compared to 1.12% of GNI in the current multiannual financial framework (2007-2013).

On the other hand, the overall ceiling for payments proposed by the Commission for the 2014-2020 period (EUR 972 bn) is also around 3% higher than EU budget expenditures appropriated to the period 2007-2013 (EUR 943 bn). With regard to the Gross National Income, the total amount of payment appropriations for the period 2014-2020 will be lowered to 1.00% of EU GNI, compared to 1.06% of GNI for the 2007-2013 period.

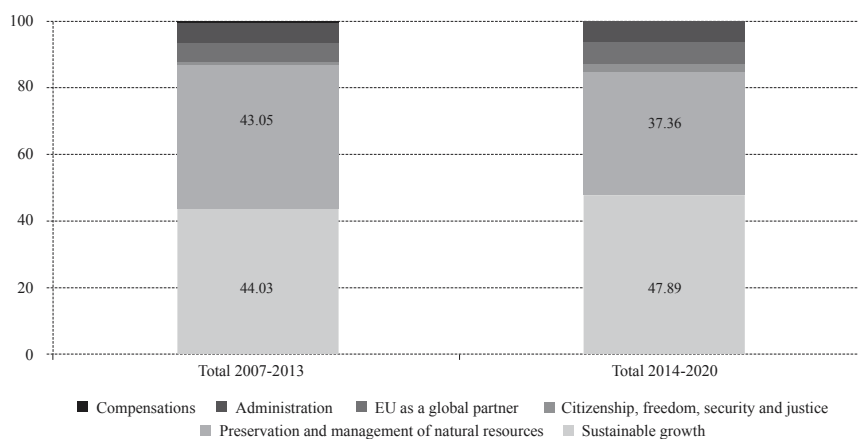
Definitely, one novelty is that the European Commission is presenting for the first time consolidated expenditures for the period 2014-2020, alongside the multiannual financial framework, which in total represent 1.11% of EU GNI (CPMR, 2011). Consolidated expenditures mean a number of flexibility instruments which

are traditionally outside the multiannual financial framework because they are not programmable. In this category are Emergency Aid Reserve, European Globalisation Adjustment Fund, Solidarity Fund, Flexibility Instrument, etc. However, if during an emergency the budgetary authority decides to activate additional funds, they are entered into the annual EU budget. In addition, the European Development Fund is financed outside the budget due to a different financing key (European Commission, 2011h).

Structures of EU budget expenditures by main categories in the period 2007-2013 and in the new financial perspective from 2014 to 2020 are shown on figure 4.

FIGURE 4

Structure of EU budget expenditure by main categories in periods 2007-2013 and 2014-2020 (in %)



Source: Author's calculation based on Council of the EU (2005) and European Commission (2011h).

The categories Sustainable Growth and Preservation and Management of Natural Resources represent over five sixths of total EU budget expenditures, i.e. 87% in the period 2007-2013 and 85% in the period 2014-2020. The categories EU as a global player and Administration represent lower shares in total expenditures, i.e. 6-7% and 6% respectively. As compared to the financial perspective 2007-2013, in the new financial perspective 2014-2020 certain changes are proposed in the structure of expenditures, meaning that according to the actual proposal the category Sustainable Growth would be increased from 44% to 48% of total expenditures, while the category Preservation and Management of Natural Resources would be decreased from 43% to 37% of total expenditures.

In general, in the period 2014-2020 the Common Agricultural Policy and Cohesion Policy remain the EU's two biggest budgetary items (respectively 36.3% and

32.8% of the 2014-2020 budget), but their budgets have been somewhat reduced (-16.4%) to the advantage of Research, Development and Innovation (+35%) and External Aid (+25%) in particular (CPMR, 2011).

Cohesion policy continues to be concentrated on the less developed regions and Member States with GDP per capita less than 75% of the European average (so called *convergence regions*). The moderate reduction in the Cohesion Policy budget can be partly explained by the fact that some regions have phased out of the convergence objective. Within the Cohesion Policy it is planned to create a new category (so called *transition regions*), which will concern regions whose GDP per capita is between 75% and 90% of the EU average. Among these regions, those phasing out of the convergence objective will benefit from a “safety net” equivalent to two-thirds of their current budget allocation (CPMR, 2011). There are also so called *competitiveness regions*, covered by the Regional Competitiveness and Employment program, whose GDP per capita is at least 75% of the EU average. The amount of resources allocated to these regions depends on their unemployment rate, employment in less prosperous economic sectors, level of education, population density, etc. (Kandžija and Cvečić, 2011).

According to proposal of European Commission (2011d), Cohesion Policy funds in a total amount of EUR 376 bn, including both Structural Funds and Cohesion Fund, will be allocated to the following segments:

- EUR 162.6 bn (43%) to convergence regions;
- EUR 38.9 bn (10%) to transition regions;
- EUR 53.1 bn (14%) to competitiveness regions;
- EUR 11.7 bn (3%) to territorial cooperation;
- EUR 68.7 bn (18%) to the Cohesion Fund.

Besides that, EUR 40 bn (11%) will be allocated to the Connecting Europe Facility in the following amounts: EUR 9.1 bn to the energy sector, EUR 21.6 bn to transport (including additional EUR 10 bn that will be secured within Cohesion Fund) and EUR 9.1 bn to information and communication technologies.

Delays in the preparation of projects, commitments and spending are responsible for an important backlog of unused appropriations at the end of the present financing period. Furthermore, the fiscal situation in some Member States has made it more difficult to release funds to provide national co-financing. Experiences with the current financial framework show that many Member States have difficulties in absorbing large volumes of EU funds over a limited period of time. In order to strengthen absorption of funding the European Commission (2011d) proposed three steps related to cohesion policy:

- to fix the capping rates for cohesion allocations at 2.5% of GNI;

- to allow for a temporary increase in the co-financing rate by 5 to 10 percentage points, thus reducing the effort required from national budgets at a time of fiscal consolidation, while keeping the same overall level of EU funding;
- to include certain conditions in the partnership contracts regarding the improvement of administrative capacity.

The Common Agricultural Policy (CAP) comprises two basic pillars, and these are agricultural market measures (first pillar) and the Rural Development Funds (second pillar). The new proposal of European Commission (2011d) suggests that CAP in the new financial perspective contains a “greener” and more equitably distributed first pillar and a second pillar that is more focused on competitiveness and innovation, climate change and the environment. On this basis a total of EUR 281.8 bn will be allocated for the first pillar and EUR 89.9 bn for the second pillar for the whole period 2014-2020.

New Common Agricultural Policy (European Commission, 2011d) introduces three novelties, and these are as follows:

- Greening of direct payments, which means that 30% of direct support to farmers is being made conditional on “greening”, ensuring that the CAP helps the EU to deliver on its environmental and climate action objectives, beyond the cross-compliance requirements of current legislation. This means that all farmers must engage in environmentally supportive practices which will be defined in legislation and which will be verifiable. The impact will be to shift the agricultural sector significantly in a more sustainable direction, with farmers receiving payments to deliver public goods to their fellow citizens.
- Convergence of payments, by which the levels of direct support per hectare will be progressively adjusted, taking account of the differences that still exist in wage levels and input costs, in order to ensure a more equal distribution of direct support. This will be achieved in a way that, over the period, all Member States with direct payments below the level of 90% of the EU average will close one third of the gap between their current level and this level. This convergence will be financed proportionally by all Member States with direct payments above the EU average. Equally, the allocation of Rural Development Funds will be revisited on the basis of more objective criteria and better targeted to the objectives of the policy. This will ensure a fairer treatment of farmers performing the same activities.
- Capping the level of direct payments by limiting the basic layer of direct income support that large agricultural holdings may receive, while taking account of the economies of scale of larger structures and the direct employment these structures generate. The Commission proposes that the savings be recycled into the budgetary allocation for rural development and retained within the national envelopes of the Member States in which they originate.

The allocation of Rural Development Funds should be based on more objective criteria and better targeted to the aims of the policy. This would ensure a fairer treatment of farmers performing the same activities (European Commission, 2011h).

Apart from the Cohesion Policies included in category *I. Smart and Inclusive Growth* and Common Agricultural Policies in category *II. Sustainable Growth: Natural Resources*, the EU also plans expenditures in the total amount of EUR 151 bn, distributed among the following categories:

- Security and citizenship – EUR 18.5 bn (2% of total EU budget in the period 2014-2020);
- Global Europe – EUR 70.0 bn (7%);
- Administration – EUR 62.6 bn (6%).

4 EFFECTS OF THE ACCESSION ON THE CROATIAN BUDGET IN 2013

Upon the accession of Croatia to the European Union, the Croatian budget will encounter numerous structural changes, of which some will have only a one-time effect, visible in the year 2013, while some of them will permanently impact budgetary cash flows. In this part of the paper the basic objective is to estimate the real effects of accession on the Croatian budget in 2013, which will be also the last year of the current financial perspective 2007-2013, while potential effects in the period from 2014 to 2020 will be closely examined in the following part of the paper.

Before, but also after, accession to the EU, countries are obligated to harmonize their tax and customs systems with the EU standards. Croatia has almost fully performed this harmonization. According to the Croatia 2011 Progress Report (European Commission, 2011c), Croatian legislation regulating indirect taxation is largely in line with the EU *acquis*, but further alignment is required in the field of VAT, notably on the scope of the reduced rates and of exemptions, free zones and special schemes.

In Croatia a zero VAT rate is still applied to a certain group of products, while the European Union prescribes the usage of a maximum of two reduced rates that may not be lower than 5% (Council Directive 112/2006/EZ of the European Union, 2006). Sopek (2012) estimates that upon harmonization of the reduced rates with the EU Directive, with the assumption of all other rates being unchanged, government revenue will increase by an amount equal to 0.4% of GDP in the case of the application of the lowest prescribed VAT rate of 5% on deliveries that are currently taxed at the zero rate, or analogously 0.8% of GDP in case of application of a VAT rate of 10%.

Due to harmonization of Croatian excise duties system with the EU Directives additional harmonization in the field of excise duties with regard to chargeability of duty on coal, gas and electricity and minimum rates can be expected (European Commission, 2011c). The Screening Report for Croatia on Chapter 16 – Taxation for the period up to March 2010, states that, aiming at the harmonization of the Croatian excise duties legislation with the *acquis*, Excise Duties Act (NN 83/09) was adopted, entering into force on 1 January 2010. The Act is aligned with the horizontal Directive 92/12/EEC on excise duties and with the *acquis* concerning the harmonized excise duties levied on alcohol and alcoholic beverages, tobacco products and energy products (Government of Republic of Croatia, 2010a). Afterwards, the Regulation on the Excise Duty Rate on Tobacco Products (NN 102/10) proposed an increase in proportional excise duties from 30% to 33% of the relevant retail selling price. Due to this increase, the share of overall excise duty (specific plus proportional excise) increased approximating the minimum rate of 57% of the retail selling price required under European legislation (Kuliš, 2010). With regard to the obligation of reaching an overall excise duty on cigarettes of at least 60% of the weighted average retail selling price of cigarettes released for consumption and the minimum requirement of EUR 90 per 1,000 cigarettes up to 1 January 2012, Croatia has requested a transitional period until the end of 2017 to meet the mentioned requests, as was envisaged for certain EU Member States. Moreover, Council Directive 2008/118/EC of 16 December 2008, which entered into force on 1 April 2010, introduced a legislative framework for computerizing the movement and surveillance of excisable products. Following the technical consultations with European Commission representatives, Croatia should harmonize its excise duties legislation with Council Directive 2008/118/EC no later than up to the moment of accession to the EU. In the same period Croatia should also enforce amendments of the Excise Duties Act in part related to accounting accruals of excise duties on natural gas and electricity (Government of Republic of Croatia, 2010b). Since there is no publicly available analysis of the possible financial implications of the above mentioned harmonizations, and having in mind that the major categories of excise duties are already harmonized with the EU Directives⁷, for the analysis hereafter it will be assumed that the total net effect will be negligible. Still, it is suggested that a detailed analysis of misalignments of Croatian and European excise duties system be initiated, and the net effect of their harmonization estimated. Apart from the potential costs or benefits to the general government budget, this analysis should definitely include potential impacts to the total costs of tax authorities, i.e. administrative and compliance costs of taxation, as well as other costs induced by economic distortions generated by the nature of these taxes like changes in demand for these products and consequently changes in the prices and supply of these products.

⁷ This primarily relates to excise duties on petroleum products (53% of total revenues from excise duties in 2011), tobacco products (31%), alcohol and beer (7,4% of total revenues from excise duties in 2011) (Ministry of Finance Time Series Data, 2012).

The level of harmonization of Croatian customs system with the *acquis* is very high, and only some minor changes in customs legislations are expected. The Croatian Customs tariff for 2011 has been aligned with the 2011 EU Combined Nomenclature. Some minor discrepancies still remain in the quota allocation system, inward/outward processing authorization, end-use and the internal transit arrangements (European Commission, 2011c). However, upon accession to the EU Croatia will lose a significant part of customs revenues which it realizes with the EU Member States, due to free entrance to the common internal EU market, i.e. accession to the Customs Union. Customs Union means free movements of goods and services by the abolition of physical and technical borders between Croatia and the EU Member States. In other words, upon accession to the EU only commodities imported from countries outside the EU will be subject to custom duties. According to the Croatian Bureau of Statistics (CBS, 2012), in 2010 Croatia imported goods and services worth HRK 110 bn; HRK 66 bn (60%) of imports were from the EU Member States. In 2011 the level of imports increased to HRK 121 bn, HRK 75 bn (62%) of them coming from the EU Member States (CBS, 2012). With the assumption that a similar ratio of imports from the EU Member States will be retained in 2013 (60%), in the second part of the year 2013 only 40% of imports will be subject to custom duties, and of these 75% of the revenue will be transferred to the EU budget as Traditional Own Resources of the EU budget. Resulting from increased imports in 2011, the share of customs revenue also increased from 0.49% of GDP in 2010 to 0.52% of GDP in 2011 (Ministry of Finance Time Series Data). With the assumption that the ratio of customs revenue to GDP will be maintained at 0.5% in 2013, it can be expected that there will be a reduction of customs revenue in a total amount of approximately 0.225% of GDP, which is calculated by the following expression:

$$\frac{0.5\%}{2} \cdot 60\% + \frac{0.5\%}{2} \cdot (1 - 60\%) \cdot 75\% = 0.225\% \text{ GDP} \quad (1)$$

Since the above stated conditions will be in place only in the second part of the year 2013 when Croatia becomes a formal EU Member State, both of these addends from expression (1) have to be divided by 2 in order to recalibrate the calculation to a semi-annual level. The first addend in the expression above amounts to 0.15% of GDP and shows the loss of budget revenue in the second part of the year 2013 as a result of the abolition of customs in the internal EU market, by which 60% of semi-annual customs revenue will be automatically lost upon Croatian accession to the EU due to trade in goods with the EU Member States. The second addend in the total amount of 0.075% of GDP shows Traditional Own Resources of the EU budget, i.e. the remaining part of 40% of semi-annual customs revenue will be distributed to the EU and Croatian budget in the proportion of 3:1. According to predefined keys, 75% (0.075% of GDP) of semi-annual imports subject to customs will be transferred to the EU budget, while the remaining part of 25% (0.025% of GDP) will be kept in the Croatian budget.

It is very important to emphasize that upon the accession of Croatia to the EU all free trade agreements with third countries that Croatia signed independently will cease to apply, including the Central European Free Trade Agreement (CEFTA). This will almost certainly have a specific repercussion on conditions of trade in goods, primarily in the regional context, with unfavorable effects on the Croatian trade balance. At the same time, upon accession to the EU, Croatia will be obliged to apply all agreements that current EU Member States have signed with third countries or with international organizations.

Upon accession of Croatia to the EU, in 2013 some funds will be transferred on the basis of VAT from the Croatian budget to the EU budget according to the applied rate of 0.3% on the VAT base or 50% of Croatian GNI. According to the data of European Commission (2007a), the Croatian VAT base is estimated at 57% of GNI, meaning that for the purpose of the calculation of VAT-based revenue a rate of 0.3% will be applied to the amount equal to 50% of GNI. According to Eurostat projections, the share of GDP in GNI in 2013 should amount to approximately 1.05 (calculated based on Eurostat database). Therefore, Croatian contribution to the EU budget on the basis of VAT would amount to somewhere in the region of 0.08% of GDP in 2013, which is derived from the following calculation:

$$\frac{0.3 \cdot 50\% \cdot 1.05}{2} = 0.08\% \text{ GDP} \quad (2)$$

The first two members of the product in the numerator represent the application of the rate of 0.3% on 50% of GNI and the third member of the product in the numerator represents the ratio of GDP to GNI. The whole represents the calculated annual amount of VAT-based revenue from the Croatian budget as a share of GDP. Since Croatia will be EU Member State only in the second part of 2013, the above amount from the numerator has to be divided by 2 in order to get a semi-annual figure.

Total annual revenue of the EU budget on the basis of GNI amounted to about 0.75% of GNI of all EU Member States in 2010 (European Commission, 2011a). For the purpose of the estimation of expenditure from the Croatian budget on this basis in 2013, an unchanged annual share of 0.75% of GNI at the level of the whole EU budget will be assumed. The total amount of Croatian expenditures based on GNI in 2013 is derived from the following expression and it amounts to 0.36% of GDP.

$$\frac{0.75\% \cdot (GNI_{EU-27} + \frac{1}{2} GNI_{HR}) \cdot \frac{\frac{1}{2} GNI_{HR}}{GNI_{EU-27} + \frac{1}{2} GNI_{HR}}}{GDP_{HR}} = 0.36\% \text{ GDP} \quad (3)$$

All GDP and GNI projected data for the year 2013 used in the calculation above are taken from the Eurostat database. Total GNI-based revenue of the EU budget

in 2013 will comprise 0.75% of GNI of all 27 current EU Member States and half of the Croatian GNI projected for the year 2013 (since Croatia will be EU Member State only in the second part of 2013). The absolute amount of total expenditure from the Croatian budget on the basis of the GNI in 2013 is calculated by multiplication of total VAT-based revenue of the EU budget (first two members of the product in the numerator) and the share of Croatian semi-annual GNI in the total GNI base, where total GNI base represents EU-27 total annual GNI enlarged by the Croatian semi-annual GNI. For the final figure, i.e. relative amount of total expenditure from the Croatian budget on the basis of the GNI in 2013, it is necessary to divide the absolute amount by the projection of the Croatian GDP for the year 2013.

Average annual expenditure of the New Member States for the UK correction in the period from 2005 to 2010 amounted to 0.068% of the GDP (European Commission, 2011b). The same annual share in GDP will be assumed also in the projection for 2013, which means that Croatian contribution for the UK correction on a semi-annual basis would amount to 0.034% of GDP.

TABLE 2

Financial package from the EU for Croatia in 2013 (in million euro and % of GDP)

	Commitment appropriations		Payment appropriations	
	Million euro	% GDP	Million euro	% GDP
1 Sustainable Growth (1a + 1b)	496.8	1.04	167.4	0.35
1a Competitiveness for Growth and Employment	47.4	0.10	17.6	0.04
1b Cohesion for Growth and Employment	449.4	0.94	149.8	0.31
of which Structural Funds	299.6	0.63	89.9	0.19
of which Cohesion Fund	149.8	0.31	59.9	0.13
2 Preservation and Management of Natural Resources	20.4	0.04	12.1	0.03
of which market related expenditure and direct payments	9.0	0.02	9.0	0.02
3 Citizenship, freedom, security and justice	73.3	0.15	42.2	0.09
4 EU as a global player	0.0	0.00	77.6	0.16
5 Administration	22.0	0.05	22.0	0.05
6 Compensations (Cash-flow facility)	75.0	0.16	75.0	0.16
Total	687.5	1.44	396.3	0.83

Source: European Commission (2012); author's adjustment.

Upon entering the EU, Croatia will have to provide a certain amount for equity and reserves contribution for the European Investment Bank (EIB). Cuculić,

Faulend and Šošić (2004) estimated that amount to 0.03% of GDP, which is also in accordance with the payment of almost all New Member States in the first year of their membership (Money-Go-Round.eu database)⁸.

However, apart from the already mentioned categories of expenditures that will be transferred to the EU budget, the Croatian budget will also benefit from EU membership, manifested in the form of a various transfers from the EU budget. In May 2012 the European Commission published a document as a preparation for the 2013 Draft Budget (European Commission, 2012) including also the whole proposal of a Croatia financial package for the semi-annual period of the EU membership. The main proposed budgeted categories of expenditures from the EU budget allocated to the Croatian budget, i.e. potential revenues of Croatian budget, are shown in table 2.

According to the data from table 2, in 2013 Croatia should receive overall financial funds in total amount of EUR 396 m from the EU, i.e. equivalently 0.83% of GDP. The major share of these funds in amount of EUR 167 m (0.35% of GDP) relates to category Sustainable Growth, including the subcategories Competitiveness for Growth and Employment and Cohesion for Growth and Employment. Funds dependant on projects amount to total EUR 159 m (0.33% of GDP) and include funds from Structural Funds in amount of EUR 90 m (0.19% of GDP), funds from the Cohesion Fund in amount of EUR 60 m (0.13% of GDP) and market related expenditures amounting to around EUR 9 m (0.02% of GDP). Unlike payment appropriations including expected financial funds that should be paid to Croatia in 2013, commitment appropriations comprise total amount of all activities that should be executed, i.e. invoiced during 2013. Total amount of commitment appropriations should amount to EUR 687.5 m or 1.44% of GDP, which is about 73% more than expected payment appropriations. The category EU as a global player does not include commitment appropriations, while payment appropriations are included in the draft budget and amount to EUR 77.6 m. The reason beyond is that upon accession of Croatia to the EU, funds aimed at external policies will no longer be allocated to Croatia, instead financing of Croatia will become a part of the EU internal policies. Hence in 2013 there will be no new contracted payments from pre-accession funds, but there should be payments for projects contracted in some earlier period, which is visible in the payment appropriations item.

Table 2 does not include direct payments for which the sum of EUR 93.2 m is provided in 2013, according to the data of the Ministry of Finance (2012). These funds will be paid in 2014 for liabilities towards farmers per hectare of eligible area relevant in 2013. According to the data of the Ministry of Finance (2012) the total financial envelope for the first half year of the EU membership should amount

⁸ Among all observed countries (NMS-8), only Poland paid in 0.04% of GDP for EIB in 2004, while all other countries paid in 0.03% of their GDP.

to around EUR 800 m. Apart from the already mentioned commitment appropriations items that were presented in table 2 and that are dependent on different project activities, the envelope is also composed of the following funds:

- Schengen – external borders strengthening (EUR 40 m);
- Reinforcement of institutions (EUR 29 m);
- Demining (EUR 2.4 m);
- Supports to the budget in strengthening the financial position (EUR 75 m);
- Costs of administration in Brussels (EUR 22 m);
- Participation in different EU programs – Seventh Framework Programme for Research, lifelong learning, Erasmus Mundus, Trans-European Network for energy and transport (TEN-E and TEN-T; all together EUR 47.4 m).

In order to receive the allocated funds from the Structural Funds, Cohesion Fund and Rural Development Funds, the Croatian primary task is to establish adequate administrative absorption capacities and to prepare adequate project activities. Moreover, it is necessary to ensure funds for co-financing of projects at the state and local level, which will definitely represent an additional burden on the Croatian budget. The minimum prescribed co-financing rate of a Member State corresponds to 25% of total funds from the Structural Funds and Rural Development Funds and 15% of total funds from the Cohesion Fund. On the other hand, the EU has historically co-financed projects to the extent of between 50 and 85% (The European Bank Coordination (“Vienna”) Initiative, 2011), while the financing of the remaining part up to the total project value was the responsibility of the Member State in question.

From the amounts planned for financing from the EU budget, as shown in table 2, it is quite easy to derive the amount of funds that should be secured by a Member State itself (in this case Croatia) for projects co-financing. This amount depends on the applied rate of Member State co-financing and can be expressed with the following formula:

$$R_i^{MS} = R_i^{EU} \cdot \frac{r_i}{1 - r_i} \quad (4)$$

where R_i^{EU} represents the amount of funds for projects financing from the EU budget and r_i is the average applied co-financing rate of the Member State itself. Index i denotes a general category for co-financing, i.e. Structural Funds, Cohesion Fund or Rural Development Funds.

From the calculation derived from the application of the equation (4) it can be concluded that Croatia will have to provide financial resources of approximately 0.09% of GDP for co-financing projects under the assumption of the application of the minimum co-financing rate (25% of total funds from the Structural Funds and Rural Development Funds and 15% of total funds from the Cohesion Fund), i.e. 0.15% of GDP in the case of the application of the co-financing rate amounting

to 10 percentage points higher than the minimum prescribed (35% of total funds from the Structural Funds and Rural Development Funds and 25% of total funds from the Cohesion Fund).

TABLE 3

Net position of Croatia in the EU budget and financial costs/benefits of accession in 2013 (% of GDP and in million euro)

Revenue/expenditure category	% GDP	Million euro
1 Payments from the EU budget	0.83	396.30
Structural Funds	0.19	89.90
Cohesion Fund	0.13	59.90
Market related expenditure and direct payments of the EU budget	0.02	9.00
Other resources of the EU budget	0.50	237.50
2 Payments into the EU budget	0.55	260.33
Traditional own resources	0.08	35.81
VAT-based own resources	0.08	37.56
GNI-based own resources	0.36	170.66
UK correction	0.03	16.30
3 Other costs/benefits (-/+)	-0.13	-63.67
EIB contribution (-)	0.03	14.32
Free trades with the EU (-)	0.15	71.61
Projects co-financing – average rates (-)	0.15	73.22
Projects co-financing – minimum rates	0.09	43.54
Abolishment of VAT zero rates (+)	0.20	95.49
Costs of institutions and reforms (-)	?	?
Net position of Croatia in the EU budget (1-2)	0.28	135.97
Financial costs/benefits of accession (1-2-3)	0.15	72.29

Source: Author's calculation.

From the calculation explained in the previous part of the text and presented in table 3 it is shown that Croatia should benefit in a financial way from the EU membership in 2013. The Croatian net position in the EU budget in 2013 shows that Croatia, just like all New Member States, should be a net recipient, in which the anticipated Croatian net position in the EU budget is equal to 0.28% of GDP, i.e. EUR 136 m in absolute terms⁹. Furthermore, the total net financial position of Croatia due to accession to the EU in 2013 should amount to approximately 0.15% of GDP, i.e. around EUR 72 m.

It is important to stress that figures from table 3 can be correctly interpreted exclusively with assumption that all funds from the EU budget shown in table 2 flow directly into the general government budget, i.e. assuming all funds from the EU funds are used by the public sector. The implicitly contained assumption in the

⁹ Nominal amount is calculated by multiplication of estimated effect (as a percent of GDP) with projection of GDP for 2013 (Eurostat database).

calculations is that all of these funds truly create the effect of substitution, i.e. they replace national financing in certain areas. Otherwise, the level of national funding would remain the same, while some funds from the EU budget would be an additional source of funds for projects and grants, but also an additional pressure on the budget.

Moreover, there is also a part of expenditure that is almost impossible to assess, since there are no publicly available data on the costs of building institutions and their maintenance, as well as costs of execution of reforms, so this is left out of the analysis. However, the cost of institutions involved in implementation of EU programs is already included in the Croatian budget, since the institutional framework for using the EU funds is mainly the continuation of a structure that is involved in the implementation of the pre-accession program (Ministry of Finance, 2010). Thus, these effects should not have any impact on this analysis.

5 CROATIAN BUDGET PERSPECTIVE IN THE PERIOD UP TO 2020

After accession to the EU, EU funds will be targeted to strengthening transport infrastructure (especially in the field of railway transport), water management, projects of centres for waste management, the energy sector, connecting science and the economy and business infrastructure. Special attention is also dedicated to the labour market, high-quality employment and social inclusion, promotion and execution of lifelong learning programmes and prequalifications in order to develop a flexible and competitive labour force (Ministry of Finance, 2012).

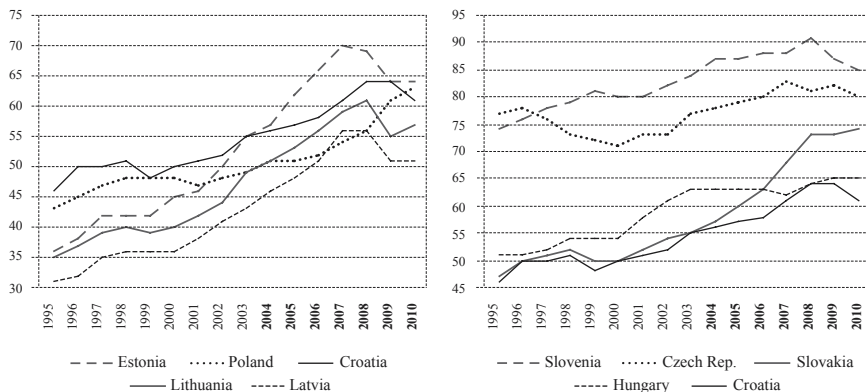
Real effects after 2013 are impossible to estimate adequately, since a large part of EU budget revenues and expenditures is still under special attention and it is currently considered an optimal model of financing and implementation. Still, for the purpose of the estimation of future expected net financial flows from the EU budget, experiences of the EU New Member States can be definitely helpful. In this context, the New Member States (NMS) comprise 8 countries that have been EU Members since 1 May 2004, and these are the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Slovakia and Slovenia. These countries are especially interesting in this analysis since they entered the EU in the middle of the year, as Croatia should, and they are also connected to Croatia by a common geographical, political and social background.

Funds from the Structural Funds and the Cohesion Fund are available to regions, i.e. countries with GDP per capita lower than a specific percentage of the EU average. In the case of the Structural Funds and the Cohesion Fund this percentage is 75%, while a special arrangement of transition regions funds within Cohesion Policy is available to countries with a per capita GDP between 75% and 90% of the European average. According to Eurostat data, in 2010, Croatian GDP per capita equalled 61% of the EU average, which means that in the following period Croatia will be a candidate for receiving funds from the Structural Funds and the

Cohesion Fund. Figure 5 shows per capita GDP movements of EU New Member States and Croatia in the period 1995-2010.

FIGURE 5

GDP per capita measured by purchasing power standard expressed as an average of EU-27 in the period 1995-2010



Source: Author's calculation.

In the whole period 1995-2010 all New Member States and Croatia were below the all 27 EU Member States average, but they recorded GDP per capita growth comparable to the EU-27 average¹⁰. Generally, it can be concluded that countries with higher initial GDP per capita have recorded slower growth and vice versa, a phenomenon known as real convergence¹¹. A slower growth trend than Croatia in the observed period was recorded only by Slovenia, which had significantly higher GDP per capita in 1995 (74% of the EU-27 average), and by Poland and Hungary, which had relatively similar levels of GDP per capita in 1995 as Croatia (Hungary 51%, and Poland 43% of the EU-27 average)¹². Therefore, it can be assumed that the pre-accession phase, together with EU membership, has had a certain impact on the stimulation of the economic activity growth. With the optimistic assumption of medium term growth as in the period from 2000 to 2010 (growth from 50% to 61% of the EU-27 average, i.e. 22%), Croatia may reach in 2020 the level of 74.4% of the EU-27 average GDP per capita in PPS, which means that it would come close to the transition countries threshold. Still, in view of current economic conditions, it is highly unlikely that in the following period up to 2020 Croatia could manage to record real economic activity growth as it did in

¹⁰ EU-27 average is denoted with 100, and it is calculated retroactively for the whole period 1995-2004 such that includes average of all 27 current Member States, although some of them were not members of the EU in that time.

¹¹ For more details on real convergence in the EU see for instance Vojinović and Oplotnik (2008), Halmai and Vásáry (2010), Kulhánek (2012) and European Commission (2009:33-34).

¹² Growth trend in this case means a slope (regression coefficient) of a linear regression line of a specific country.

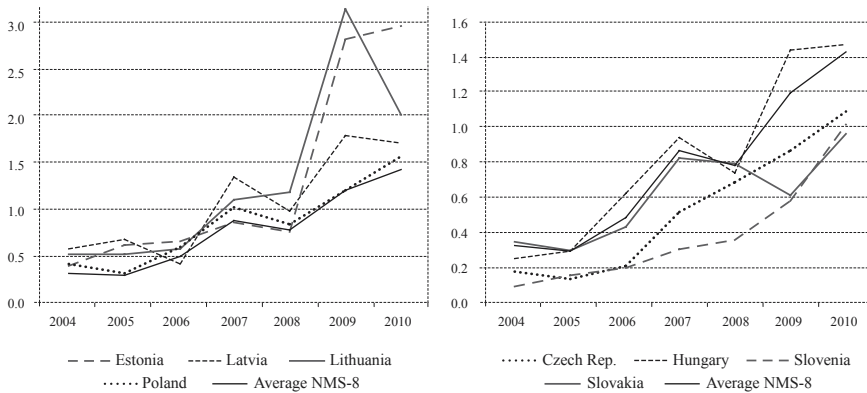
the pre-crisis period. Hence a more realistic scenario estimates much lower growth of GDP per capita to 63% of the EU-27 average in 2020¹³.

5.1 NEW MEMBER STATES' EXPERIENCES IN THE FIRST YEARS OF THE EU MEMBERSHIP

The following text will show an analysis of the budget revenue of New Member States in the period 2004-2010, which will later on be used in an estimation of the Croatian potential. Figure 6 shows the budget revenue of New Member States on the basis of Structural Funds, as a percentage of GDP.

FIGURE 6

Revenue from Structural Funds to New Member States (% of GDP)

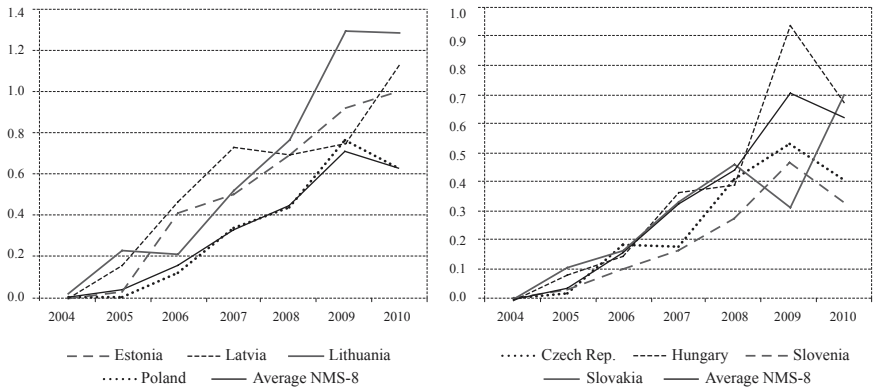


Source: Author's calculation.

The New Member States average shows a clear trend of revenue growth on the basis of the Structural Funds from the moment of accession to the EU in 2004 up to 2010. Expectedly, in the first years of EU membership, the share of the funds amounts to less than 0.5% of GDP due to implementation of starting project activities and development of absorption capacities. In the seventh year of EU membership, i.e. in 2010, the average share of revenue from the Structural Funds reached almost 1.5% of GDP. It is interesting to notice Lithuania in 2009 and Estonia in 2010 since these two NMS managed to withdraw funds in the total amount of around 3% of GDP.

¹³ Calculated by using actual Croatian GDP growth estimates for the years 2012 and 2013 available from public press release of the Institute of Economics, Zagreb (2012) in which it is estimated that the Croatian real GDP growth rate was -1.3% in 2012 and will be 0.8% in 2013. For further projections, as well as for projections of average GDP growth rates of EU countries, IMF forecasts were used (IMF, 2012a; 2012b). For the sake of simplification of calculation of GDP per capita, it is assumed that the number of inhabitants in Croatia and the EU will not change significantly.

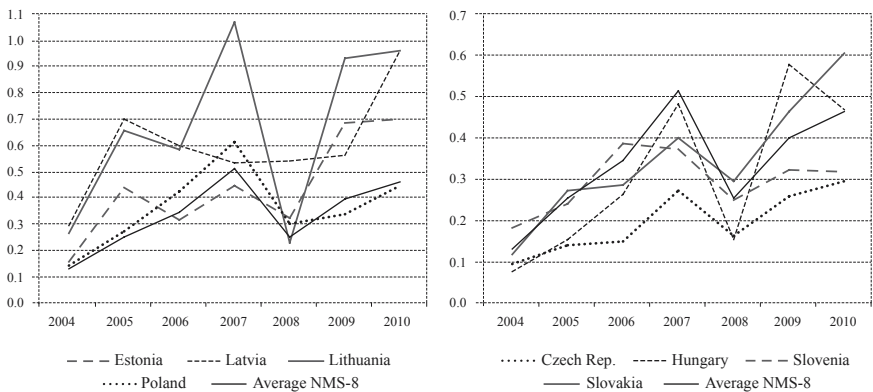
FIGURE 7
Revenue from Cohesion Fund to New Member States (% of GDP)



Source: Author's calculation.

As in the case of the Structural Funds, all New Member States satisfied the criteria for getting funds from the Cohesion Fund. Since the Cohesion Fund is also project-oriented, funds that a certain Member State manages to withdraw from the EU budget depend on projects and it is quite reasonable that the amount of funds withdrawn will gradually increase year by year as the absorption capacities are built. In the first two years of EU membership the amount of funds paid from the Cohesion Fund to NMS is almost negligible, while after these two years gradually increases year by year in the average amount of 0.1-0.2% of GDP. In the whole observed period from 2004 to 2010 Lithuania managed to withdraw the highest share of funds in GDP in 2009 and 2010 amounting to approximately 1.3% of GDP.

FIGURE 8
Revenue from Rural Development Funds to New Member States (% of GDP)

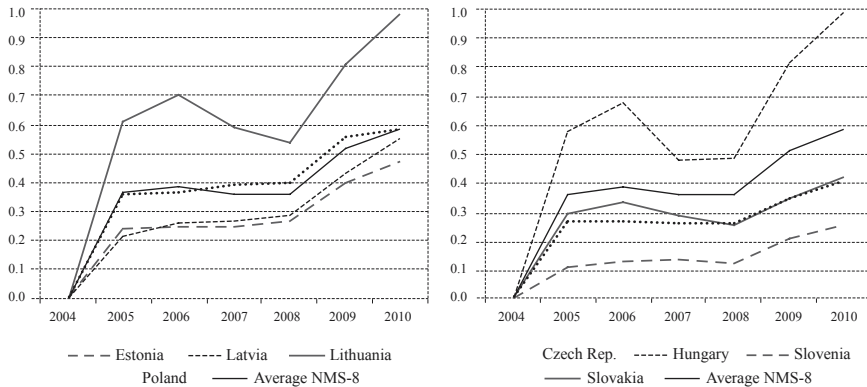


Source: Author's calculation.

Rural Development Funds paid to New Member States show a less obvious trend in the observed period 2004-2010. Nevertheless, as in the case of the Structural Funds and the Cohesion Fund, the lowest paid amount of funds was recorded in the first year of EU membership, i.e. in 2004, and afterwards increased. The highest average paid amount was recorded in 2007 and amounts to 0.51% of GDP. In case of Rural Development Funds Lithuania also managed to withdraw the highest share of funds with regard to the size of GDP in 2007 amounting to 1.07% of GDP.

FIGURE 9

Direct aids in agriculture to New Member States (% of GDP)



Source: Author's calculation.

Direct aids in agriculture were paid to New Member States for the first time in 2005. Cuculić, Faulend and Šošić (2004) pointed out that payments of individual grants are delayed by about three months, which transfers payments into the next fiscal year, producing what is called the liquidity gap. In the period from 2005 to 2008 the average share of direct aids in agriculture in GDP was kept at similar levels (averagely 0.37% of GDP), but it increased in 2009 to 0.52% of GDP and in 2010 to 0.58% of GDP.

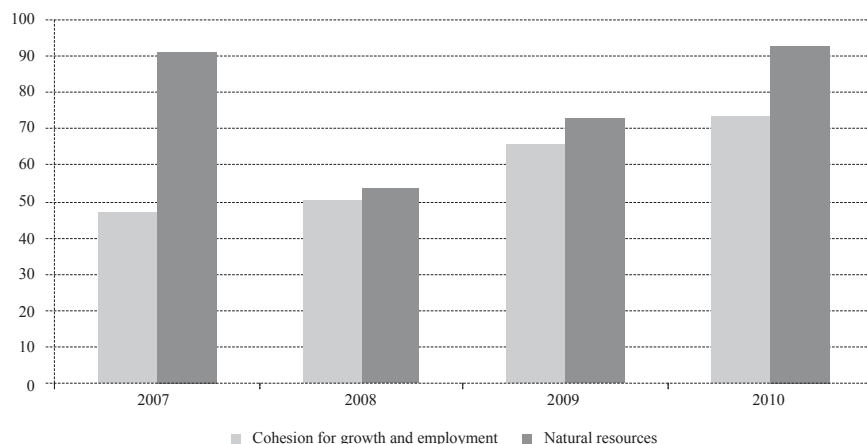
As mentioned above, the Cohesion Policy comprises the Structural Funds and the Cohesion Fund, while Natural Resources Policy comprises funds within the Common Agricultural Policy. Figure 10 shows the share of paid and allocated funds to New Member States in the period 2007-2010 divided into these two categories.

Figure 10 clearly shows a growth trend in utilized funds in the observed period in the Cohesion Policy category, which increased from an average of 47.2% in 2007 to 73.6 in 2010. Among Member States there were significant differences by categories, which is indicated by the standard deviation, amounting to 31 percentage points in 2009. Shares of paid funds with regard to allocated funds to NMS are

generally higher in the Natural Resources category. However, in this category there is no obvious trend of an increase in utilization as there is in the case of Cohesion for Growth and Employment. It is important to emphasize that between allocations and payments there is a certain time gap in cash flows. That is, the allocated funds connote commitment appropriations and relate exclusively to funds available for contracting in the current year. On the other hand, paid funds connote payment appropriations, i.e. relate to funds contracted in the current year, but also to those contracted in the past years, which are payable in the current year.

FIGURE 10

Share of paid and allocated funds to New Member States in 2007-2010 (%)



Source: Author's calculation based on European Commission (2007b; 2007c; 2011b).

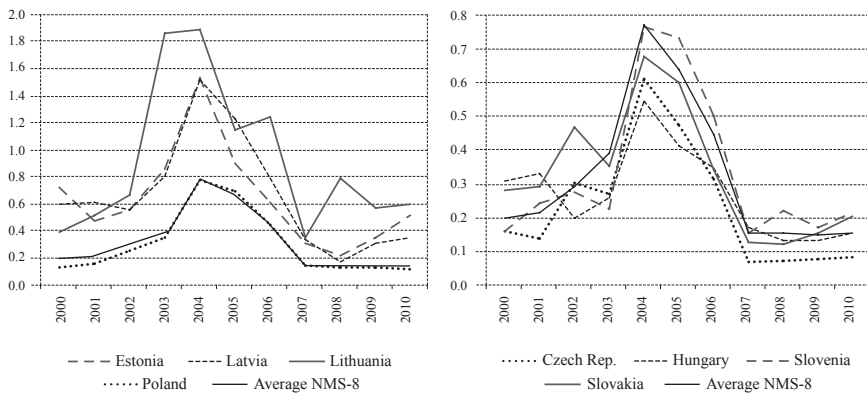
Other revenues of Member States are somehow related also to the period before formal EU membership, since this category includes mainly pre-accession assistance, but also special arrangements and budgetary compensations. These revenues of New Member States show a clear growth trend up to 2004, which is the period including numerous preparations for institution development and administration, and for the purpose of building absorption capacities. In the period from 2004 to 2007 the average share of other revenue from the EU budget to NMS recorded a sharp decrease, primarily due to a decline in residual cash flows for contracted projects covered by the pre-accession funds. In the period after 2007 this share was kept at a stable level of about 0.15% of GDP.

Generally, it is very important to stress that not all countries have the same possibilities of funds withdrawal, as measured by the share of their GDP. The reason is that some Member States have relatively higher, while on the other hand some of them have relatively lower allocations in the EU funds. According to data from European Commission (2007b; 2007c), calculated average of allocated funds for categories Cohesion for Growth and Employment and Rural Development for

New Member States in the period 2007-2010 amounts to 3.2% of GDP, but the highest proportions of funds relative to the size of GDP were allocated to Hungary (4.0%), Lithuania (3.9%) and Latvia (3.7%). Lithuania generally has the highest proportions of received funds in the observed period 2004-2010, which can be mainly explained by higher allocated funds. IMF (2006) stresses that in the period from 2004 to 2006 approved funds from the EU funds to Lithuania amounted on average to 5.4% of GDP per annum, which is the highest share of funds in GDP among all New Member States. Latvia had a similar share in GDP, while all other Member States had over one percentage point lower approved amounts from the EU funds as a percentage of GDP.

FIGURE 11

Other revenue from the EU budget to New Member States (% of GDP)



Source: Author's calculation.

5.2 CROATIAN POTENTIAL IN THE EU FINANCIAL PERSPECTIVE FROM 2014 TO 2020

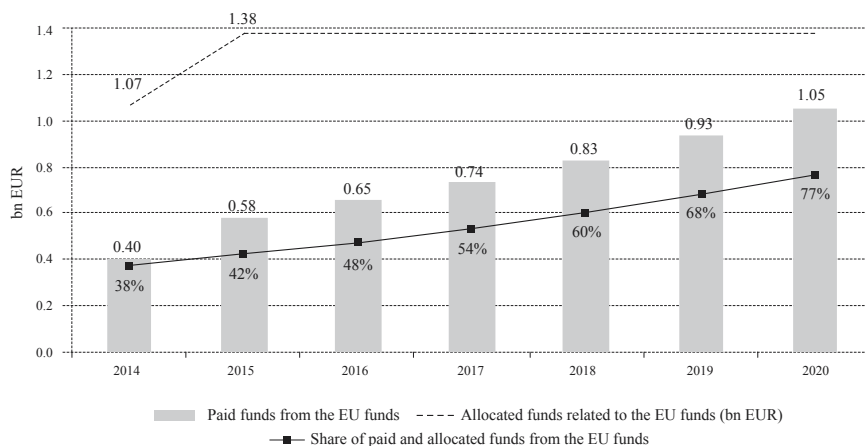
New Member States experiences examined in the previous part of the paper can serve as a good background for the estimation of the Croatian potential in the period from 2014 to 2020 covered by the new EU financial perspective.

According to the Ministry of Finance (2012) data, from 2014 and onwards an annual amount of EUR 1.6 bn has been promised to Croatia from European funds used through the Cohesion Policy. The Rural Development Fund in 2013 will continue to be executed through IPARD and will amount to EUR 27.7 m, while in the following years it should be significantly higher and amount to around EUR 330 m. In the financial envelope it is stated that funds in 2014 will be 2.33 times higher than those allocated for 2013, and in 2015 approximately 3 times higher

than those in 2013¹⁴. This means that in 2014 Croatia should have a disposable potential of around EUR 1.1 bn for using financing from the EU funds, in the categories Cohesion Policy and Common Agricultural Policy. This amount should rise to EUR 1.4 bn in the period 2015-2020. However, here it is very important to stress two things. First, the new financial perspective is still not adopted, so these amounts promised to Croatia may be considered only as a possibility. Second, the total received funds from these sources will depend primarily on the capability of absorption of these funds, i.e. quality projects.

FIGURE 12

Allocated and paid funds from EU funds (in billion euro) and share of paid and allocated funds (in %), period 2014-2020



Source: Author's calculation.

Based on average shares of paid and allocated funds in the case of the New Member States (figure 10) gradual and stable growth of payments from the EU funds to Croatia in the whole period from 2014-2020 can be assumed. From table 2 it is noticeable that the expected proportion of paid and allocated funds for the items Cohesion Policy and Common Agricultural Policy should amount to 34.6% in 2013. Assuming that Croatia will be recording linear growth from 34.6% in 2013 to 76.5% in 2020 (where 76.5% represents a weighted average of Cohesion Policy and Common Agricultural Policy of New Member States in 2010 from figure 10) and with the assumption of allocated funds of EUR 1.1 bn in 2014 and EUR 1.4 bn per annum in the whole period 2015-2020, it can be concluded that Croatia

¹⁴ Financial envelope means the amount of funds that a candidate country manages to ensure during the negotiating process and which will be available to this country after obtaining full membership status in the European Union. In case of Croatia a gradual increase of funds has been negotiated (the so called phase-in period), by which in the first one year period (1 July 2013 – 30 June 2014) Croatia would be entitled to 60% of its normal allocations, in the next one year period (1 July 2014 – 30 June 2015) 80% and after 1 July 2015 100% of its normal allocations (Ministry of Foreign and European Affairs, 2011). Additionally, total allocated funds in 2013 will be significantly lower due to semi-annual membership.

could withdraw funds from the EU budget related to the EU funds in the total amount of EUR 5.2 bn in the new financial perspective 2014-2020. Thereby this amount continuously increases amounting to EUR 0.4 bn in 2014, EUR 0.6 bn in 2015 up to EUR 1.1 bn in 2020. Projections of allocated and paid funds from the EU funds, as well as the share of paid and allocated funds in the period 2014-2020 are shown on figure 12.

According to the data from table 2, Croatia could count on other revenue from the EU budget in the amount of EUR 237.5 m in 2013, i.e. 0.49% of GDP. Following the same dynamics of other revenues from the EU budget as in the figure 11, it can be concluded that Croatia may receive funds amounting to 0.6% of GDP in 2014, 0.4% of GDP in 2015 and 0.2% of GDP in the whole following period up to 2020. This would correspond to approximately EUR 1.15 bn for the whole period 2014-2020. Projection of total funds received from the EU budget in the period 2014-2020 is shown in table 4.

TABLE 4

Projections of funds received from the EU budget in the period 2014-2020 (% of GDP and in billion euro)

	2014	2015	2016	2017	2018	2019	2020	Total 2014-20
1 Allocated funds related to EU funds (EUR bn)	1.07	1.38	1.38	1.38	1.38	1.38	1.38	9.32
2 Share of paid and allocated funds from the EU funds (%)	37.53	42.26	47.59	53.59	60.34	67.94	76.50	55.69
3 Paid funds from the EU funds (1*2)	0.40	0.58	0.65	0.74	0.83	0.93	1.05	5.19
4 Other revenues from the EU budget (EUR bn)	0.30	0.21	0.11	0.12	0.13	0.14	0.15	1.15
Total (3+4)	0.70	0.79	0.77	0.86	0.96	1.07	1.20	6.34

Source: Author's calculation.

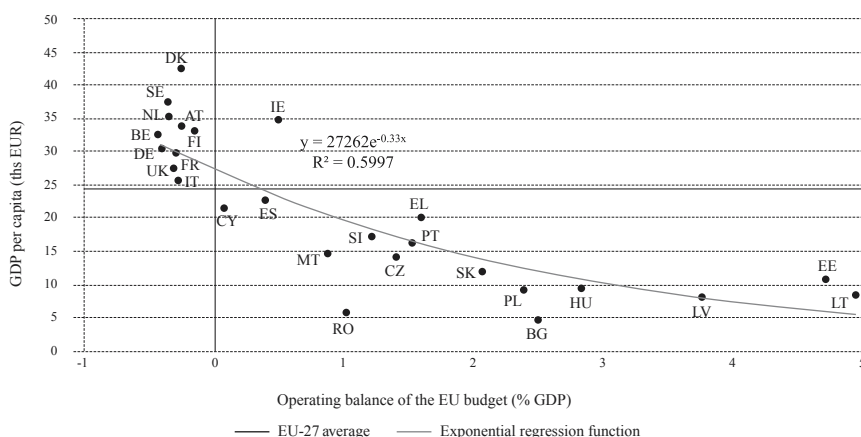
Total estimated amount of all funds that Croatia may receive from the EU budget in the period from 2014 to 2020 amounts to EUR 6.34 bn, whereby the annual amounts gradually increase year after year, starting from EUR 0.7 bn in 2014 to EUR 1.2 bn in 2020. It is also interesting to notice a slight decrease in total received funds from the EU budget in 2016, compared to 2015. The reason for this decrease lies in the fact that other revenue from the EU budget significantly decreases in the first years of EU membership primarily due to decreased payments agreed in the pre-accession period, while on the other hand utilized, i.e. received funds from the EU budget grow by slower dynamics. These two effects taken together led to this decline in projection for 2016. A rough estimate of the funds that Croatia could receive from the EU budget in the new financial perspective up to

2020 may serve as an insight into possible perspective with numerous constraints mentioned in the previous text. Final realization will primarily depend on real allocated funds, built administrative and financial capacities, as well as quality projects activities.

Figure 13 shows net positions of all Member States in the EU budget with regard to their GDP per capita in 2010.

FIGURE 13

Scatter plot of operational balance of the EU budget and GDP per capita (in current prices) in all Member States, year 2010



Source: Author's calculation.

Operational balance shows the net position of a certain Member State in the EU budget, i.e. the difference between payments into the EU budget and received funds from the EU budget. The scatter plot of the operational balance of the EU budget and GDP per capita (in current prices) of all Member States shows that there is a clear negative relationship between these two variables, meaning that Member States with higher GDP per capita generally record lower net financial positions with the EU budget and vice versa. For modelling this relationship an exponential function was shown as the best choice, since it fits realisations quite well, which is proven by the relatively high coefficient of determination (R^2 statistics) of 60%. Detailed statistics of the observed model, i.e. its transformation into the linear regression model, are displayed in table 5¹⁵. It is interesting to notice that all New Member States are net recipients of funds from the EU budget, this

¹⁵ A simple transformation of an exponential model into a linear regression model was made. By taking a natural logarithm of an expression $y = ae^{bx}$ a linear equation model expressed as $y' = a' + \beta x$ is derived, where $y' = \log y$ and $a' = \log a$. This means that there is a linear relationship between natural logarithm of GDP per capita measured by purchasing power standard and operational balance of the EU budget.

amount varying from the lowest 1.2% of GDP in case of Slovenia to the highest 4.9% of GDP in case of Lithuania.

TABLE 5

Estimated parameters and representativeness indicators of linear regression model of GDP per capita (natural logarithm) and operational balance of the EU budget

Variable	Estimate (t-statistics) ^a
Intercept (α)	10.21323 (100.45)***
Regression coefficient (β)	-0.3302 (-6.12)***
Representativeness indicators	Realization of sample
Explained sum of squares (SSreg)	7.16726
Residual sum of squares (SSerr)	4.78345
Total sum of squares (SStot)	11.95071
F-statistics	37.46
p-value of F-statistics	<0.0001
Coefficient of variation	4.43442
Coefficient of determination (R^2)	0.5997
Adjusted coefficient of determination (Adj. R^2)	0.5837

^a Significance levels: 1% ***, 5% ** and 10% *.

Source: Author's calculation.

Assuming that the modelled relationship between GDP per capita and operational balance of the EU budget is generally in place, from familiar GDP per capita figure the approximate net position of Croatia in the EU budget in a certain year can be estimated. A projection of Croatian GDP per capita in current prices in 2020 amounts to EUR 15.445 and involves net receipts of funds from the EU budget in a total amount of 1.72% of GDP, i.e. EUR 1.13 bn¹⁶. Still, it has to be emphasized that this estimation was made assuming the current system of financing the EU budget, which means that all the potential changes explained in chapter three of this paper could significantly modify the final result. Hence this estimate of the Croatian net position could be primarily understood as a Croatian potential in 2020, rather than a direct projection, since the final net position of Croatia in the EU budget will depend on a numerous set of variables impossible to assess fully qualitatively and quantitatively. Therefore all quantitative results given in the paper should be interpreted with special care.

¹⁶ GDP forecast for 2020 was calculated from actual GDP growth and inflation rate estimations for 2012 and 2013 available in the press release of the Institute of Economics, Zagreb (2012), which provides an estimate of Croatian real GDP growth rate of -1.3% in 2012 and 0.8% in 2013, as well as an inflation rate of 3.2% in 2012 and 2.6% in 2013. Furthermore, it is assumed that there will be a linear real GDP growth up to 2.5% in 2017 in accordance with IMF (2012a; 2012b) long term forecasts and stabilization of real GDP growth on the level of 2.5% up to 2020. In the whole period 2014-2020 a stable inflation rate of 2.5% is assumed. Moreover, for the sake of simplification it is implicitly assumed that population sizes in Croatia and the EU in 2020 will remain the same as in 2013.

6 CONCLUSION

Accession of Croatia to the EU will bring numerous changes certain to impact net cash flows from the EU budget to Croatian budget and vice versa. In the second half of the year 2013 Croatia will be included in the still current financial perspective of the EU covering the period 2007-2013. According to estimation results presented in this paper Croatia should a record positive net financial position in the EU budget in a total amount of EUR 136 m, i.e. 0.28% of GDP. This means that Croatia, just like all other New Member States, should also be a net recipient of funds from the EU budget. Total net financial position of Croatia due to the EU membership includes also additional costs and benefits of accession like various harmonisations and need for project co-financing at the state and local levels. Even in this variant, Croatia should be in plus to a total amount of EUR 72 m, i.e. 0.15% of GDP.

The period from 2014-2020 is covered by the new financial perspective of the EU described in the multiannual financial framework. In the proposal of this future financial perspective, that was actual in the time of writing this paper, numerous changes in the EU budget financing system are envisaged; the most important are the abolition of current VAT-based own resources and the introduction of new revenue based on VAT, the introduction of a financial transactions tax, an expected decline in the share of GNI-based own resources of the EU budget and simplification of various correction mechanisms. However, it has to be stressed that for the moment this represents only a proposal and it is highly likely that some of proposed changes will not be adopted in the end. Nevertheless, there is definitely a need to undertake further analyses in order to assess the future implications of these taxes for all participants in the process, i.e. final consumers, the financial sector and government authorities in Croatia.

Apart from changes in the financing of the EU budget, also planned are some changes in financing from the EU budget. Newly proposed changes of financing from the EU funds should bring about a more equal and fair distribution of funds among Member States aimed at maintenance of the Cohesion Policy and Common Agricultural Policy in line with the long term objectives of the EU development. According to the assessment presented in the paper, in the new financial perspective from 2014-2020, Croatia could withdraw funds from the EU funds in total amount of EUR 5.2 bn, but it is very important to emphasize that this amount on an annual level increases from EUR 0.4 bn in 2014 to EUR 1.1 bn in 2020. The total amount of funds that Croatia may receive in the period 2014-2020 includes some residual pre-accession assistances, special arrangements and budgetary compensations. This amount is estimated at EUR 6.34 bn, whereby on an annual level it gradually increases from EUR 0.7 bn in 2014 up to EUR 1.2 bn in 2020. By the exponential regression analysis from historical data of all EU Member States it is estimated that the expected Croatian GDP per capita in 2020 would

imply the net receipt of funds from the EU budget in the total amount of EUR 1.13 bn, i.e. 1.72% of GDP.

It is important to stress that all figures assessed and elaborated in the paper represent only expectations, taking into account huge number of assumptions and that the final realization of Croatian financial flows from the moment of its accession to the EU in the mid 2013 up to 2020 is attended by numerous uncertainties. It is definitely needed to develop quality strategies for improvements in absorption capacities for the future period governed by the experiences and best practices of New Member States. Comprehensive monitoring of utilizations of withdrawn funds compared to allocated funds should be initiated, as well as projections of possible scenarios for a future period. These types of analyses should indicate all potential imperfections in existing processes and provide clear guidelines for future developments and improvements. Furthermore, broader potential costs and benefits (not necessarily of financial matters) of EU membership have not been elaborated in this paper, for instance, opening the European market to Croatia, development of competitiveness, political, social, regulatory and other changes.

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Personal income tax non-standard reliefs in European Union member states, Croatia and countries of the region

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Abstract

The paper presents an overview of the current situation in personal income tax non-standard reliefs for the EU-15, most of the EU-12, Croatia and countries of the region, as well as a comparison of them for 2006-2011. A review of personal income tax relief issues in last twenty years is given, especially concerning the reaction of the entire personal income tax system to the economic and financial crises. It is followed by comparative analysis of non-standard tax reliefs in the stated period. Despite the mostly negative attitude of tax theory (and policy), economic crisis and fiscal consolidation, they still play very significant role. The EU-15 actually broadened these reliefs in the period observed, while the analyzed EU-12, Croatia and countries of the region with less developed non-standard tax reliefs have reduced them significantly. Many of these countries, accordingly, have none today. Since the introduction of the new personal income tax system in 1994 Croatia has gone a long way, from their complete exclusion to the inclusion of almost all of them and in the end the exclusion of almost all of them.

Keywords: non-standard tax reliefs, personal income tax, European Union, Croatia, economic crisis

1 INTRODUCTION

The tax reform of the 1980s already required the reduction/peel of the different tax reliefs (besides the rate reduction). This was especially pronounced for personal income tax and related non-standard reliefs. Not only were their negative fiscal effects put forward, but also their inefficiency (“neutrality” distortions and high revenue forgone in comparison with effects/benefits of those reliefs too), horizontal and vertical equity distortions as well as their complexity and non-transparency.

The stated requirement of tax base broadening was also implemented in the tax reforms of transition countries. Together with the request for rate reduction, it constitutes the basic recommendations for tax policy. These demands were renewed, gaining in importance during the economic and financial crisis and resulting fiscal consolidation. Repeal of non-standard reliefs is believed not only to contribute to the fiscal consolidation, but also to boost economic growth: directly – because of their above stated disadvantages, as well as indirectly – through making room for a personal income tax rate reduction (for instance OECD, 2010a).

In this paper a normative qualitative analysis is performed, which combines international and dynamic comparison. An international overview of non-standard tax reliefs for 2006 (Blažić, 2006:153-154, 156) is repeated for the end of 2011, following the same methodology. The reason behind such comparison was not only to detect the five year period changes, but also to perceive the changes influenced by the economic and financial crises. Namely, by comparing pre-crisis 2006 data with the newest data (end of 2011) the answer to the following question was sou-

ght: How much have the repeated requests for tax base broadening, especially emphasized in the crisis (and “post-crisis”?) period, really influenced the tax systems? A comparison of non-standard personal income tax reliefs was performed for the EU-15, some EU-12 (all except the Baltic countries, Malta and Cyprus) and countries of the region with special emphasis on Croatia.

At the beginning of the paper, after shorter definition of non-standard reliefs, a review of the literature concerning trends and analysis of tax reliefs is given. Since the paper is mostly oriented to the period of the crisis, the stress is laid to the reactions of personal income tax to the crisis, not only concerning non-standard reliefs, but also its other elements (rates, brackets, standard reliefs). According to the standard OECD methodology not only standard and non-standard reliefs are defined, but also borderline cases. Their classification is presented also. That all together presents the research methodology – the analysis framework, where the concept of non-standard reliefs is further narrowed. Some other elements of their characteristics and structuring are pointed out in tables A1 and A2, concerning their technique and resulting effects. After that, the presentation of the current situation (2011) follows as well as a comparative analysis of non-standard reliefs (2006-2011), first for the EU-15 and after that for some of the EU-12, Croatia and other countries of the region, underlying the stated differences. The paper ends with an additional retrospective review of Croatia concerning the numerous fundamental changes in non-standard reliefs.

2 RECENT ANALYSIS OF PERSONAL INCOME TAX RELIEFS

In contrast to standard reliefs that are automatically at the disposal of tax payers that fulfil certain basic (status) requirements (personal existence, income existence, marital status, children, old-age, disability and possibly also employment), non-standard reliefs are not given automatically. They are based on the concrete expenses/expenditures of tax payers (medical, charitable, insurance/pension/saving, housing ownership, educational...) that the tax system recognizes for the tax purposes (in order to diminish the tax due). The stated framework coverage of non-standard reliefs is explained in the third chapter in detail.

Most reliefs of that type are also named “interventionist” type reliefs, tax preferences or tax subsidies. Even many reliefs that are theoretically justified by ability to pay or so called “subjective net principle”¹ have distinguished subsidy characteristics. The term “tax subsidies”, which implies an analogy between revenues forgone (reduced revenues) and subsidy (transfer) allowance at the expenditure side of the budget, is related to the currently more widely accepted term “tax ex-

¹ Public finance theory distinguishes between the subjective and objective net principle. The former is about personal income being reduced by that parts of income that are not freely disposable by a tax payer, because they represent unavoidable private expenditures, i.e. income deductions for existence and non-discretionary needs. It is about the ability-to-pay principle and the reliefs that enable that principle to be maintained. The latter is about deductions from gross income (revenues/receipts) that represent all those expenses that are connected with its acquiring and maintenance.

penditures”. This implies the resulting loss of tax revenues (revenue forgone) caused by tax reliefs. Non-standard tax reliefs are especially negatively related in that respect. Since it was easier for different interest groups – the beneficiaries of such reliefs to “hide” such subsidies on the revenue side of the budget (as revenues forgone) instead of showing them explicitly on the expenditure side of budget (as subsidies), it became the most common practice in a rising number of countries to quantitatively specify those tax expenditures, very often precisely as the budget supplement. Many structurally justified reliefs (structural measures of ability to pay) have subsidy elements and it is very hard (as could be seen from the analysis framework in the third chapter) to make a precise distinction between standard and non-standard reliefs. That is why the tax expenditure calculations for the developed countries (OECD, 1996; 2010a; 2010b) do not even pretend to isolate and encompass only the “pure” tax expenditures by considering only non-standard tax reliefs in the narrowest sense, i.e. those that have a strictly subsidy character of giving incentives to the most “desirable” activities. Those calculations present more or less all tax reliefs in the broadest sense,² in order to enable a comparison of the efficiency of direct expenditures and of tax expenditures,³ but also to avoid tremendous difficulties (often discretionary) in drawing a strict borderline between stated categories.

Some recent reviews of personal income tax reliefs, as well as tax expenditure calculations based on those reliefs (inside the broader tax expenditure calculations) for some, mostly OECD member, countries could be found for instance in: Polackova Brix, Valenduc and Swift, 2004; OECD, 2010a:54-56 and Annex A; and OECD, 2010b.

Tax expenditure literature (especially concerning non-standard reliefs only) is rare, and especially rare are comparative country experiences (Polackova Brix, Valenduc and Swift, 2004:x). But the government accounting data suggest that, in spite of tax reform tendencies from as late as mid-1980s, “the use of tax expenditures is pervasive and growing” in many countries at the beginning of this century (OECD, 2010b:14 and Polackova Brix, Valenduc and Swift, 2004). It is interesting to point out that even the famous US tax reform of 1986 (Tax Reform Act), which was the pioneer of all the already explained reforming tendencies of the 1980s, including this one about abolishing/reducing especially non-standard tax

² Exemptions of some income types (although not all of them), tax allowances, tax credits, lower tax rates and tax delays (OECD, 1996:9).

³ One of the typical examples is that of tax reliefs for children. Such reliefs are structural measurements of the ability to pay (subjective net principle) and represent a typical example of standard reliefs. On the other hand, they could be easily replaced by direct subsidy – child supplement. Although tax reliefs for children are not real tax expenditures, their exclusion from the overview of tax expenditures reduces the analysis of possible efficient combinations between direct expenditures and tax reliefs in order to achieve appropriate social goals.

reliefs, “repealed perhaps 19 of 119 pre-existing tax expenditures”.⁴ The results of other subsequent significant tax law changes in other developed countries are similar – a huge number of tax expenditure (tax reliefs) are still present, and that is even confirmed by the trends in the last pre-crisis years, i.e. until 2006/2007 (OECD, 2010b:52, 269-237)⁵. The question should be raised why tax reliefs are still multiplying and growing. One of the possible answers lies in the already mentioned fact that they are easier to introduce and maintain in the law in comparison with direct subsidies – real expenditures. It is simply easier to accept the justified tax reliefs for specific-merit goods than to pursue an increase in public expenditures for the same purpose. Furthermore, in many developed countries a critical and systematic evaluation of the effects of these reliefs has been avoided. This is related to understandings of the tax system as constant and persistent in contrast to the expenditure side of budget, which is reassessed and revised on a yearly basis. This is in turn correlated with the lower transparency of tax expenditures.

In spite of the already mentioned reform tendencies from the eighties, the repeal of all targeted tax reliefs, i.e. all tax expenditures has not been generally and officially proposed for the developed countries (OECD, 2010a:3; OECD, 2010b:24). “Assuming in the first instance that there are valid reasons for government involvement (such as market failures or merit goods), there are conditions under which tax expenditures are most likely to be successful, or even the best, policy tools to achieve their objectives” (OECD, 2010b:24). They are justified if, based on cost-effectiveness analysis, their benefits continue to outweigh their costs (OECD, 2010b:3). So, the focusing on standard tax reliefs is proposed, followed by continued evaluation of the cost-effectiveness of non-standard reliefs (OECD, 2010a:3, 22). The negative effects of the standard (as well as remaining non-standard) tax reliefs on vertical equity, i.e. progressivity could be mitigated/eliminated by the substitution of tax allowances by non-wastable tax credits.⁶

Of course, the stated arguments are not to be seen as an argument capable of undermining the already stated critical arguments concerning the (over)numerous and (over)generous non-standard tax allowances. In this respect, “an important and timely associated issue is that some OECD member countries have enacted, or are considering, fiscal rules that make use of expenditure ceilings” (OECD,

⁴ The source of this information (OECD) speaking here about tax expenditures refers to the tax reliefs that cause those expenditures. “The largest effect on the number of dollars of tax expenditures (here it is again not about number of reliefs, but specific tax expenditures, i.e. revenue lost in monetary terms) in that instance likely came from the reduction of marginal tax rates, which reduced the values of the many tax expenditures based on exclusions or deductions from taxable income that were not repealed.” (OECD, 2010b:52).

⁵ It is very hard to compare countries concerning the number of tax expenditures (tax reliefs and non-standard ones of them especially) as well as the amount of tax expenditures (their monetary sum). Based on both the criteria the USA, UK and Canada are among the highest in ranking (countries of large numbers and amounts) and for instance Germany and the Netherlands among the lowest ones. But, these results are influenced more by specific definitions, classifications and ways of counting reliefs in specific countries than by objective criteria and that is why they are very doubtful (OECD, 2010b). It should be mentioned also that the stated analysis encompasses only ten OECD countries (the data refer to different years from 2004 to even 2008).

⁶ This is harder to achieve for different non-standard tax reliefs for saving in the broader sense, which are not only generally provided as tax allowances, but also automatically related to higher incomes.

2010b:15). Other countries are also considering (the extension of) ceilings, which could be given either for singular relief or for pooled reliefs – most of them or all of them (the case of Croatia before the repeal of non-standard reliefs). This could be seen from the later analysed tables A1 and A2 in appendix.

Tax expenditure measurement for the pre-crisis period (and the period at the very beginning of the crisis) for the OECD member countries (2006-2008) showed the greatest share of personal income tax expenditures, as usual. This is true for all OECD countries except Denmark, France, Mexico and United Kingdom, where VAT tax expenditures dominate (OECD, 2010a:50), while in Australia, Canada, Korea and Norway the corporate income tax expenditures shares are relatively high. In Italy, Spain and United States the personal income tax expenditures have the greatest percentage in personal income tax revenues (even around one third). “The main categories of tax expenditures (were) reported... for social and family policies, supporting home building and improvement, encouraging savings, promoting R&D. Several countries cited the promotion of employment and economic development as reasons for certain tax reliefs” (OECD, 2010a:56-57)⁷.

A very interesting insight is given by the tax expenditures/reliefs trends data during the ten years prior to the present analysis. It is about data for OECD countries in the period from approximately 1996/1997/1998 to 2006/2007/2008 (OECD, 2010a:57-59). Although some new reliefs were introduced and old reliefs repealed, a generally increasing trend in the use of these reliefs is present, especially concerning personal income tax. For the countries reporting detailed data, it could be seen that it is just about non-standard reliefs. It seems that the repeal of tax reliefs is often associated with a rate reduction (as was the case in Croatia), but the introduction of new reliefs is not explicitly associated with a rate increase. Political obstacles are often mentioned as one of the major obstacles in the way of repealing tax reliefs (it is about interest groups that would become losers if reliefs were abolished).

An overview of data from particular countries shows a rise in personal income tax expenditures in many countries, especially in stated period (OECD, 2010a:63): in Australia (especially from 2004), Belgium (from 2005) and France, Spain, Switzerland and United States. In contrast, tax reliefs were reduced in the Czech Republic (the standard ones in 2006 because of the conversion from tax allowances into tax credits, as well as non-standard ones in 2008 because of the introduction of the flat tax),⁸ Germany (reforms from 2000 and 2008 have reduced some employment incentives), Mexico, the Netherlands (reform from 2001), Norway (reform from 2004-06) and the Slovak Republic (the famous flat tax reform of 2004 abolished almost all non-standard reliefs). In Portugal many reliefs were

⁷ Supporting home building and improvement as well as encouraging savings represent relevant non-standard tax reliefs according to the analysis done in this paper (see the third chapter).

⁸ It was only about the reduction of certain individual reliefs, and not about the repeal of some of them.

abolished in 2005 in order to compensate revenue loss due to the reduction in marginal rates of personal income tax, but new reliefs were reintroduced in 2006. Denmark has also abolished some reliefs.

Since welfare and family reliefs (including also general employment incentives for lower income groups, which are those that are rising most) belong to the standard reliefs (according to the presented analysis framework in the third chapter) their detailed development will not be elaborated here. The attention will be drawn to the rising reliefs for different types of saving, including home ownership in the already stated period (OECD, 2010a:66). Such reliefs are widely available in OECD countries. This is particularly the case for the preferential treatment of home ownership (especially mortgage interest deductions) and retirement plans. Some countries (for instance Belgium and Spain) even allow a deduction for mortgage capital repayments (sole loan repayments – without the interest) and this deduction exists even today (2001 – see table A1 in appendix). Many of these reliefs have been in force for more than two decades, while additional non-standard reliefs of that type have been introduced/increased in the last decade observed (the decade before the research performed in this paper). So, Belgium and Norway increased their housing reliefs (as well as energy-saving investment) and pension reliefs. It is interesting that Portugal, after having abolished them in 2005, in 2006 reintroduced reliefs in the form of tax credits for contributions to retirement saving plans, pension funds and the purchase of personal computers. In many countries the reliefs for work related expenses (commuting expenses, car expenses, expenses for meals at work, computer expenses) increased also.

It is especially interesting to observe personal income tax changes and those of them related to tax reliefs, especially non-standard ones, in the EU at the beginning of the economic and financial crisis. In the second half of 2008 and in 2009 economic policy incentives, especially those provided on the expenditure side of budget were followed (although to a lesser extent) by tax policy incentives – those given on the revenue side of the budget. Although this was more pronounced for the developed countries, and so for the EU-15 also, still some of the EU-12 have provided such measures, as it could be seen from the simplified overview in figure 1.

At the beginning of the economic crisis, i.e. in the second half of 2008 and in 2009 (European Commission, 2009:13-19; 2010:30-48) especially pronounced were different measures of easing the income tax burden on lower/the lowest incomes⁹ by reducing statutory income tax rates, especially for lower incomes (Austria, Finland, Germany, Latvia, Lithuania, Poland, France¹⁰, the Czech Republic and Swe-

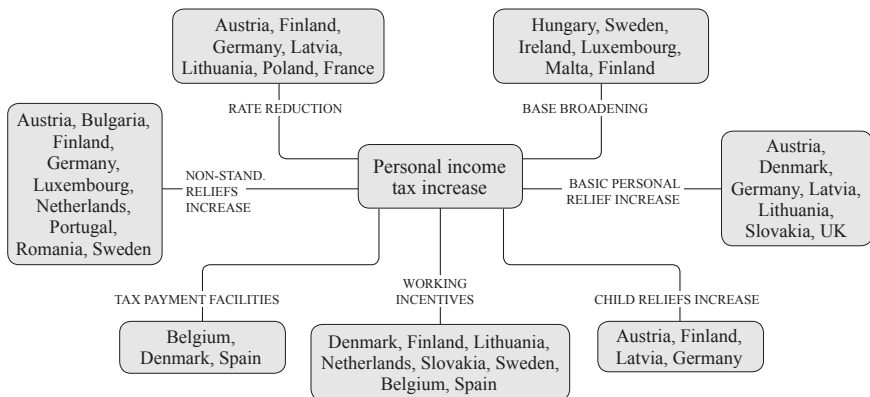
⁹ Even in the same year or next year revenue lost was often compensated by increased tax burden for middle/higher/highest incomes – for instance by broadened/increased highest income bracket (Austria), abolishment of the middle income bracket (Denmark), higher rates for the highest incomes (United Kingdom), introduction of an additional progressive income tax (Ireland).

¹⁰ Substantial reduction (two thirds) of income tax for low incomes (the technique was not specified).

den – not for personal income tax, but for employees' contributions), broadening of the basic personal relief – personal exemption – zero rated bracket (Austria, Denmark, Germany, Latvia, Lithuania, Slovakia, United Kingdom, Luxembourg¹¹), as well as child reliefs (Austria, Finland, Latvia, Germany¹²), and finally introducing/raising working incentives (tax reliefs for employment income) that are typically targeted to lower incomes and often subject to the income earner having dependent children (Denmark, Finland, Lithuania, the Netherlands, Slovakia, Sweden, Belgium¹³, Spain – not only for personal income tax but also for employers' contributions). Some countries decided to facilitate tax payments by reducing or delaying withholding tax (Belgium, Denmark). Spain, similarly, decided to lower penalty interest for delay in tax payment and extend the deadline for contributions to tax-privileged housing schemes and enable advanced claim of own housing mortgage tax deduction through monthly withholding tax payments. Greece introduced, instead of the above measures, a special negative tax, i.e. a special benefit to unemployed persons or low-income pensioners who already had contracted a mortgage loan.

FIGURE 1

Income tax reduction measures at the beginning of the economic crisis



Source: Authors, according to European Commission (2009:13-19;2010:30-48).

Tax reduction measures related to non-standard reliefs did not have the same importance as other measures. More significant fiscal impact was achieved by standard reliefs. On the other hand, many tax incentives were provided through corporate income tax or related part of personal income tax – that one concerning business income (which is out of scope of this analysis). Still, relatively numerous increases of these reliefs were registered (European Commission, 2009:13-19; 2010:30-48). Austria increased commuter tax credit and introduced the tax

¹¹ Switchover from tax allowance to the tax credit.

¹² Germany introduced a negative tax on a one time basis for children (“Kinderbonus”) as well.

¹³ Belgium reduced withholding tax for employment income and temporary prolonged delay payment.

deductibility of certain donations. Bulgaria introduced mortgage interest deduction for young families. Italy introduced tax incentives for purchases of household appliances and furniture, decided to cap the interest rate for variable-rate mortgages and reimburse the difference to the banks through tax credits, as well as to offer postponement until 2011 of the measures supporting housing renovation, i.e. the personal income tax credit on renovation expenses. Finland increased the pension income allowances in state and municipal income taxation as well as the tax credit for paid household work. Germany increased the personal income tax credit for services supplied by self-employed persons for household repairs. Luxembourg increased the deduction ceiling for the one-off premium paid as part of a temporary life insurance policy as well as the deductibility ceiling for interest paid on a housing credit. The Netherlands increased the ceiling for the deduction of annuity premiums related to private pensions. Portugal increased the deductions from taxable income related to education, health, dwelling and nursing home expenses and also introduced tax allowance for commuting expenses. Romania increased the level of deductibility of voluntary health insurance and threshold of deduction for employees' contribution to optional pension schemes.¹⁴ Sweden introduced a tax credit for renovations, conversions and building maintenance for households. Greece supplemented its non-standard mortgage interest relief with special benefits for unemployed and low-income pensioners, as already explained. Denmark decided not to stimulate pension saving through the usual non-standard relief for pension contributions indeed, but then decided to stimulate its withdrawal by preferential tax treatment. It could be concluded that the rise of non-standard reliefs in the EU refers mostly to home ownership investments (to boost construction and consumption), followed by retirement saving.

Yet at the very beginning of the crisis, some countries in unfavourable fiscal positions were not able to implement personal income tax reductions (at all). On the contrary, they mostly passed different measures to increase the burden of personal income tax, as well as other taxes. Among them, from the EU-15 especially Greece, but also Ireland could be pointed out. Ireland introduced, among other measures, an additional personal income tax similar to the Croatian "crisis tax". Among the EU-12 Lithuania was forced to reduce basic personal reliefs already in the second half of 2009. Estonia has not reacted by raising the tax burden indeed, but has postponed the planned reduction in personal income tax rate as well as the increase in basic personal relief.

Already at the beginning of 2010 a gradual halt to the dominant trend in income tax reduction was observed. Although some countries still proceeded with the described reduction measures (especially Denmark, Finland, Germany, Hungary and

¹⁴ Romania has also increased the cap for the deductibility for voluntary pension and health contributions from corporate and personal income of employers as well as has carried out some other tax base narrowing measures. They were mostly connected with capital gains incentives (exemptions for trading securities on Romanian stock exchange and for non-residents). Romania reduced dividend tax rates for non-residents also. In the end, the tax base was further narrowed by exemption of interest on term deposits and/or saving instruments.

Slovenia), more and more countries raised their tax burden, especially for the highest incomes (European Commission, 2010:30-48). Estonia, which deferred the planned tax disburdening (tax rate cut, personal allowance increase), cancelled the additional allowance for the first child. Greece additionally burdened high incomes as well increasing the entire personal income tax burden in a numerous ways. France introduced a 50% tax on bonuses exceeding 27,500 euro paid in 2009 by financial institutions to their traders. Portugal introduced a special 60% personal income tax rate for an unjustified increase in wealth of over 100,000 euro¹⁵ and started to include golden handshakes to managers and board members in the tax base. Hungary had included up to that time non-taxable incomes and even employer's contributions in the tax base. Latvia had increased the personal income tax rate, introduced capital income, dividend and interest taxation, abolished employer bonuses exemption from personal income tax and social security contributions as well as including up to that time non-taxable employment incomes in the tax base. Slovenia imposed a new additional tax at the rate of 49% on the income of management in companies receiving state aid. Spain gradually diminished employment tax credit for high incomes. The United Kingdom introduced an additional marginal personal income tax rate of 50% for highest incomes, restricted personal allowances for high incomes, and also raised contributions of employees, employers and the self-employed (European Commission, 2009:19).

Among measures concerning non-standard reliefs as well as borderline cases between standard and non-standard reliefs at the beginning of 2010 (European Commission, 2010:30-48) the following could be highlighted: increase in the tax credit for paid household work and increase of the income employment deduction, as well increases in pension allowances in state and local income taxes in Finland, increased deductibility (full deduction) of payments for health and nursing care insurance in Germany, substantial changes of existing tax reliefs for savings (private pension, insurance and investment funds) and lowering of tax relief for pension contributions for high incomes in United Kingdom (European Commission, 2009:19).

The broader synthesis of the beginning of 2010 in comparison with 2009 (as well as end of the 2008) taking into account all presented measures (figure 1), as well as inclusion of other income types (European Commission, 2010:28) already indicates a notable trend reversal. While in 2009 measures of income tax burden reduction were considerably predominant (concerning tax rates as well as tax base)¹⁶, in 2010 an almost equal number of countries reduced as raised this tax burden. Considering the tax raising technique used, the number of countries applying different measures of base broadening (among them those related to non-standard reliefs to a lesser extent) is almost the same as those applying rate increases.

¹⁵ Later (in 2011 and in 2012) it introduced additional surtaxes for high incomes also.

¹⁶ Only three countries – Greece, Ireland and to a lesser extend Lithuania, have risen personal income tax.

The same trend was further developed in the remaining part of 2010, as well as in the first half of 2011 (European Commission, 2011:32), as can be seen from the table 1.

TABLE 1

Personal income tax changes in the EU in 2010 and in the first half of 2011

	Statutory rates	Base (or special regimes)
Increase	Greece, Spain, France, Ireland, Lithuania, Luxembourg, Portugal, UK	Austria, Czech Republic, Denmark, Estonia, Spain, France, Ireland, Latvia, Portugal, Romania, Slovakia, UK
Decrease	Germany, Denmark, Finland, Hungary, Netherlands	Austria, Belgium, Denmark, Finland, Italy, Lithuania, Sweden

Source: European Commission (2011:32).

Considerable changes in personal income tax in 2010 and in the first half of 2011 are visible. They (compared to the previous data) show a further increase in the number of countries that increase personal income tax burden in mid and at the end of 2010 as well as in the first half of 2011. According to table 1, although some countries are still proceeding with the previous decade's trend of income tax decrease (which intensified especially at the beginning of the economic crisis), most of the countries have increased the personal income tax burden, especially by different base-broadening measures.¹⁷ The increase of the tax burden in Denmark in 2011 is connected with its previous decrease in 2010. The countries that in that period still decreased the income tax burden (often by providing work incentives) have made up for the resulting revenue loss by shifting the tax burden to other sources (mostly consumption).

One of the most prominent newest reform tendencies in personal income tax, in contrast to the "classical" reform tendencies set as late as the mid 1980s, is a rise in progressivity. This is a result of the renewed and rising interest in the redistributive effects of the tax system. This is one of the rare measures that can increase both the tax revenues and the vertical equity of the tax system. This tendency was anticipated by some measures mentioned already for the beginning of 2010 and even earlier. The considerable increase in progressivity could be noticed in some EU member countries (European Commission, 2011:33). "France increased the highest marginal tax rates as well as tax rates on capital income. Spain introduced two additional top personal income tax brackets of 46% and 47%, and increased tax rates on capital income from savings in 2010. In the United Kingdom, personal income tax has been made more progressive, with higher tax allowances and an additional top rate of 50% – 10 percentage points higher than the previous maximum" and a ceiling has been introduced for the use of the personal exemption.

¹⁷ However, it is logically expected and usual in such a type of analysis (table 1) to classify more countries under the "base" since it is about numerous different reliefs.

“Greece and Portugal both introduced a new 45% top rate.” Latvia and Luxembourg both increased the top rates. In Ireland the top marginal rate was increased to 52% for employees and is applied earlier (a lower threshold for the highest income bracket). Romania could be added to the listed number of countries, since progressivity is enhanced here by including also capital gains and interest on bank deposits in the income tax base (taxed, as is known, by the flat rate).¹⁸

In the period analyzed (2010 and 2011) some measures of non-standard relief reduction could be observed (European Commission, 2011:33-34). In Denmark, for instance, deductions (tax allowances) for work-related expenses (employment income) and interest expenses were reduced. That compensated, according to the classical reform recommendations, for the revenue loss resulting from the income tax rate reduction. France has, also according to the usual recommendations, replaced a tax allowance for mortgage interest with more precisely targeted loan subsidies. The tax base has considerable broadened in Latvia also.

It is obvious that the stated tax changes overviews in the times of economic crisis are comprehensive, encompassing all measures that resulted in personal income tax increase and decrease. Similarly, within the base changes, all different broadening/narrowing measures are encompassed, without special emphasis on non-standard tax reliefs, which are blamed as being the most inefficient and most inequitable as well as the main cause of complexity in the tax system and revenue loss. The presented review ends with the data for the middle of 2011, although some important measures happened (or were announced) by the end of that year. So, the comparative analysis in the remaining part of this paper will be focused exclusively on non-standard reliefs by comparing the pre-crisis period (end of the 2006) with the last available data (end of the 2011).

3 FRAMEWORK FOR NON-STANDARD RELIEF ANALYSIS

As already pointed out in chapter 2, non-standard reliefs, in contrast to standard reliefs, are not acquired automatically (depending on status), but they depend on the documentarily proven concrete (in general non-discretionary) expenses/investments of the tax payer subject to the relief. Typical non-standard reliefs encompass for instance different voluntary (social security) contributions, i.e. insurance premiums, charitable contributions, medical expenses (voluntary medical insurance premiums/contributions are already mentioned as part of the first item) and different interest payments (for loans where tax payers have borrowed for different investment purposes – the most typical example are mortgage interest).

¹⁸ Only two countries decreased progressivity in personal income tax in 2010 and in the first half of 2011 (European Commission, 2011:33). Hungary introduced a flat tax relatively late (in 2011). The flat tax rate amounts to 16%, and that almost halved the highest marginal rates. Denmark lowered highest marginal personal income tax rate (from 63.0% to 56.1%). Furthermore, two countries made significant steps in continuing dual income tax trends. Austria, which already has had considerable dual income tax elements, finally applied a dual income tax in 2011. It started to tax financial capital gains regardless of their duration at the same flat rate of 25% at which dividends, interests and other capital gains are taxed. That broadened the tax base. Portugal has similarly broadened its tax base by inducing flat taxation of all capital gains regardless of their duration.

Borderline cases¹⁹ encompass child care expenses, household expenses, contributions for compulsory social security contributions, and eventually (other lump-sum) work-related expenses (expenses related with employment). Such reliefs are mostly considered standard ones, so they are treated in same way in this paper (they are not encompassed by the analysis performed in the remaining part of the paper).²⁰ Reliefs for child care and household expenses are some sort of reliefs for employed spouse, because they are related to its specific status (employment) and specific family situation (children and their number). That is why they could be regarded as standard reliefs. Since alimony is the result of the existence of child(ren), as well as specific (non)marital status, deduction in this case could be considered standard relief also. Employment relationship presents a specific status also, where some costs (for instance compulsory social security contributions) are incurred automatically. The same is true for different lump-sum reliefs for employment (work-related expenses) as well as for reliefs that present a combination of employment income reliefs (“status”) and family situation (children) as is the case with earned income tax credit. Finally, commuting costs are considered non-standard reliefs, although they are caused by employment location (possibility to move, other discretionary elements of those costs).

Furthermore, deductions of costs that are related to the acquiring of income are not to be treated as reliefs, since this is about the already explained objective net principle²¹. The only exception from this principle in the analysis refers to the commuting expenses of employees. The reasons are already mentioned, i.e. there exist different ways in avoiding those costs and they vary depending on personal circumstances (residence location). Regarding other work-related expenses of employees, their reliefs are treated depending whether they are given on lump-sum bases (standard reliefs) or tare based on specified (partly discretionary) costs, i.e. extraordinary high costs (non-standard reliefs). The former relief is not given very often and that is why it is classified under “other costs”.

The second exception is interest payments encompassed in this analysis. They are cost related to the capital income, which is generated from the loan taken. The most interesting relief in that sense is mortgage interest relief, which is widely used. Tax theory requires the resulting income – imputed rent from owner occupied housing to be taxed also. The non-taxation of that sort of income in most countries contradicts the objective net principle. Since this income is not taxed in general, there is no ground for deduction of costs in this case. As the result, such reliefs are classified as non-standard. For other interest payments, where such

¹⁹ Borderline cases and related problems are analyzed in more detail in: Blažić (2006:132-135, 137-141, 146-215), as well as Blažić and Drezgić (2012:67-68).

²⁰ So, OECD, for instance, in its regular yearly publication “Taxing Wages” by calculating the tax burden of the average worker (which is calculated taking into account standard reliefs only) includes the relief for compulsory social security contributions also (considering it the standard relief).

²¹ Also, this analysis does not encompass specific reliefs given to personal income tax payers that are entrepreneurs (business income tax payers).

capital income is taxed (securities, for example), such classification is less justified, but it could still be argued that such costs are not necessary and unavoidable.

The analytical framework for the definition and classification of different reliefs is based in general, as well as in this analysis, on the classical income concept.²² In the end, it is necessary to refer also to this theoretical problem: is the adequate baseline for defining tax reliefs that of income of the consumption type (for instance OECD, 2010:17, 45; Carroll, Joulfaian and Mackie, 2011)²³ Some countries provide reliefs for some saving/investment types also. These reliefs (together with already mentioned reliefs for compulsory and voluntary retirement saving and life insurance) could not be considered tax reliefs at all, if the consumption concept in its genuine (standard) form (savings adjusted income tax) is taken as the adequate tax base concept. Starting from the income concept, on the contrary, the tax exemptions of some capital incomes, which are very frequent, especially in the EU-12 and countries of the region, should be regarded as tax reliefs. But they are reliefs in the broader sense, as already mentioned. This analysis encompasses non-standard reliefs only, i.e. reliefs in the narrower sense (defined as specific nondiscretionary expenses). So the non-taxation of capital income represents privileged tax treatment and departure from the classical income concept and results in the tax base narrowing. But this privileged treatment does not represent non-standard reliefs in the narrower sense and is consequently not included in the further analysis.

According to the stated theoretical framework the comparative analysis encompasses the following non-standard reliefs:

- relief for voluntary pension insurance contributions, regardless whether they are paid to private or public insurance funds,
- relief for life insurance premiums,
- relief for medical expenses, including also voluntary medical insurance contributions,
- relief for commuting and moving expenses,
- relief for charitable contributions,
- relief for interest payments,

²² Classical income concept is so called comprehensive or synthetic income, which is also called “Schanz-Haig-Simons (S-H-S) income”, denoting the founders of that concept. Income is accrual of economic power in some period. It is formed by all possible sorts of income (labour income, capital income, transfers). Considering its use, it consists of consumption and increase in net worth (saving). The opposite concept – so called “consumption concept” has two forms. The first one is the genuine (standard) one, where the base is S-H-S income minus saving (savings adjusted income tax), i.e. the tax base is consumption. The derivative of that model – so called “alternative model” is interest-adjusted income tax, meaning that all capital income (interest in the broader sense) is deductible from the S-H-S base. If transfers are ignored, this form of tax is simply reduced to labour income tax.

²³ The stated problem as well as other problems of defining a real “benchmark” for non-standard tax reliefs and related defining and measuring of tax expenditures, as already pointed out in previous chapter, make a tax expenditure comparison among countries almost impossible, i.e. very conditional (OECD, 1996; 2010a:40-53 and Annex A; 2010b; Altshuler and Dietz, 2011).

- other reliefs for different expenses (for instance education, investments/saving).

The current (end-2011) non-standard reliefs are compared to end-2006 reliefs in order to perceive changes made over the last five years. The analysis is based on the standard international tax legislation on-line data of the International Bureau of Fiscal Documentation (IBFD). The latest (end-2011) data of their “Tax Research Platform” (IBFD, 2012) are compared to the already performed non-standard reliefs overview for the countries in question for 2006 (Blažić, 2006:153-154, 156). The 2006 analysis was done based on the methodologically identical IBFD Edition at that time *European Tax Handbook* published on CD ROM (IBFD, 2006).

Although the above stated publications both follow the strict relief classification based on their technique (tax allowances/exemptions/deductions in contrast to tax credits), the detailed description of the reliefs depends on the particular country reporter. Consequently, it often happens that some reliefs are not described in detail or even, in a case of a numerous reliefs, the country reporter restricts his report to the “most important ones” (as for instance in the case of France)²⁴. The stated problem influences both the scope and the changes detected in the already existing reliefs²⁵.

Since the analysis is about the influence of the economic crisis on tax reliefs, it is realistic to assume that the newest data (end 2011) are still “premature” concerning the (possibly too slow) reaction of the tax legislation to the crisis “post-crisis?” period as well as the extension of crisis in many countries. The greater influence of the base broadening demands could be seen maybe as late as 2012 or even 2013. Furthermore, the presented income tax trends data from the previous chapter should also be taken into account. Namely, some “set off” of reliefs is possible, i.e. the increase of non-standard reliefs from the beginning of the crisis could be compensated by their later (insufficient) reduction. However, that is the positive element of this analysis, which should give some kind of (up to date) result/resume of the conducted non-standard tax relief measures influenced by the economic crisis.

²⁴ In the cases where the reporter for particular country mentions that, this is also noticed in the comparative tables A1 and A2 in appendix. But there is a reasonable suspicion that not all of the reporters emphasize this, so some of the reliefs are omitted in that way. This could make a comparison between the years stated for the country in question harder, especially if the reporter is changed in the meantime. The changes of reporters for different countries also imply the problem of data being only differently presented (for instance shortened). That could lead to the wrong impression that the reliefs have been simplified/changed.

²⁵ One of the potential problems is that tables A1 and A2 in appendix do not entail specific quantitative amounts of reliefs. This is not possible, since most countries’ data do not entail such data. Even where such data are present, it would be hard to find out whether the rise in these amounts is a result of an effective rise in relief or of an inflation adjustment.

The comparative analysis in this paper (tables A1 and A2 in appendix) presents all the relevant relief elements in as great detail as possible. That is why additional remarks besides tax allowance (TA) and tax credit (TC) remarks are given. So, F denotes full deduction (allowance), i.e. that all the relevant costs/expenditures subject to relief are deducted in full from the tax base. Full tax credit is, of course, not possible (the tax system would make up for all those expenses to the tax payer). That is why a tax credit is provided as partial (P), i.e. as part of the relevant expenses. Such partial provision exists very often for the tax allowances also (partial tax allowance – PTA). PTA in contrast to PTC (partial tax credit) already implies certain limitation of tax allowance, especially when the tax allowance was previously full (FTA). Such limitation is often made by defining fixed tax allowances (F_xTA) and fixed tax credits (F_xTC), which are more appropriate concerning fiscal effects. F_xTA and F_xTC are usually used for standard tax reliefs, especially personal/family exemptions, but they occur also for non-standard reliefs, especially when such reliefs are intended to be provided on a lump-sum basis and not bound to specific quantitative amounts of cost. It can be seen that this is already about borderline cases.

It has already been pointed out that the TCs are mostly partial (PTC), being provided as partial – share (percentage) of the costs. However, when percentage (%) is explicitly given in tables, it denotes a situation in which the TC is not a share (percentage) of the specific expense, but of the tax payer's personal income (I%). If TC is higher than this income, the difference is mostly lost, i.e. not refunded to the tax payer as the negative tax. The term “non-wastable” denotes the opposite and rarer situation in which the TC is not wasted if it is higher than the tax due. The difference is paid out to the taxpayer as a transfer (negative tax).

Due to fiscal and other reasons, tax reliefs often have an upper limit (ceiling – C). It is mostly stated in an absolute amount, meaning that no relief is allowed after that amount. It is possible for a ceiling not to be given in absolute amount, but as income percentage (I%).

It is also possible for reliefs not only to be expressed as part (percentage) of income (I%), but to be income related (IR). This means that with the rise of income the relief decreases (inverse proportionality). Such relation is caused by social effects and is very frequent recently (standard allowances – personal exemption (basic tax allowance) at the flat tax for instance). Very similar is the situation of gradual phasing out (p.o.) of relief with the income rise.

4 COMPARATIVE ANALYSIS OF NON-STANDARD RELIEFS IN THE EU-15 (2006-2011)

Table A1 in appendix presents the comparison of current non-standard tax reliefs' situation (end-2011) with the situation from the end of 2006 for the EU-15. All the changes are pointed out – the abolished reliefs are underlined and written in italic

letters, new reliefs are bolded and relief modifications are shaded (inside them their new elements are bolded again).²⁶

The insight into the current situation (2011) shows that developed tax systems still use a broad array of non-standard reliefs. Almost all the countries provide relief for voluntary pension contributions/premiums, while fewer of them provide relief for life insurance premiums. There is no country that does not provide even one of these reliefs. When both are provided, the technique is the same (with the exception of Italy). Tax allowance is the predominant form of these reliefs, which is logical (concerning the analogy of voluntary pension contributions with the compulsory ones and the similarity of life insurance with the former). Only Belgium and partially Italy and Portugal (which turned to tax credits completely) provide these two reliefs as tax credits. These reliefs are in general limited by a ceiling in order to prevent fiscal outflow and mitigate their negative vertical equity effects.

Most of the countries have reliefs for medical expenses. These are characterized not by the upper threshold – ceiling, but by the lower threshold. This threshold is either explicitly stated or taken into account by being given only for high medical costs. Some countries (Greece, Italy and Portugal) provide that relief as a tax credit, which is not in accordance with ability to pay principle, but reflects its social character. Although theory points out the possibility of substituting the relief for voluntary health insurance for the relief for medical expenses, some countries provide both reliefs.

A lot of countries provide relief for commuting expenses. The approval of such relief or its amount often depends on the distance. Instead of that relief France provides moving expenses relief, while Sweden and Germany provide both reliefs. In general these reliefs are in the form of tax allowances, which is logical since they are one of the costs of acquiring income (objective net principle).

The majority of countries allow relief for charitable contributions, which could be claimed to be the most justified (see the sixth chapter). Most of the countries have accepted the fact that this relief is more efficient in the form of a tax allowance. In contrast, Portugal, of course, as well as Spain and France provide that relief in the form of a tax credit.

All of the countries have relief for interest payments, which could be explained by the objective net principle, as already stated. Most of countries give it as a tax allowance, and five as a tax credit, which is not in accordance with the objective net principle. This implies the social goals of the most used of those reliefs – this one for mortgage interest.

²⁶ More specified analysis – tables containing changes only – is presented in Blažić and Drezgić (2012:68-72).

Among other reliefs, the relief for educational expenses, work-related expenses (employment expenses) as well as reliefs for different saving/investment forms (in general as tax allowances) could be pointed out.²⁷

The analysis of **changes** of non-standard tax reliefs in the 2006-2011 period is expected to reflect the base broadening demands (repeal/reduction of reliefs), which have lately also been especially emphasized. But the comparison of the 2006 and the 2011 figures reveals no significant base broadening trend based on the significant number of repealed reliefs. Moreover, the number of newly introduced reliefs outweighs the number of those repealed. This, however, does not imply changes in the quantitative amounts of reliefs of the same size in both stated directions, which are not encompassed by the analysis (as already stated in the second chapter). It is possible that the stated limitations in the third chapter still imply a strong influence of the trends from the beginning of the crisis (base narrowing through non-standard reliefs) and relatively weak trends from the end of the crisis (base broadening) also. The modifications in reliefs (shaded areas) imply their reductions (base broadening), which is visible from, for instance, the introduction of an upper limit (ceiling) or fixed tax allowance instead of (part of) the real expenses, but there are some modifications in the opposite direction. Modifications are neither numerous nor all directed towards base broadening, which is again, in accordance with the review of the trends in the second chapter.

Nevertheless, even this limited analysis has proven the already known fact, pointed out in the second chapter also, that once introduced, tax reliefs are hard to repeal.²⁸ This is true regardless of the already presented criticisms,²⁹ even under the rising pressure of fiscal consolidation due to the economic and financial crisis.

5 COMPARATIVE ANALYSIS OF NON-STANDARD RELIEFS IN SOME EU-12 AND COUNTRIES OF THE REGION (2006-2011)

It is much easier to analyse the non-standard tax reliefs in the EU-12 (not including the Baltic states, Malta and Cyprus) and countries of the region (table A2 in appendix). The reason is very simple – these reliefs are traditionally not developed in these countries, especially in those from our region. This is the result of personal income tax not having been developed in these countries. Ex-socialist countries did not have synthetic/comprehensive personal income tax, but mostly schedular taxation – taxation of some income types that implicitly excluded/signi-

²⁷ Such tax allowances are somehow identical to the non-taxation of some capital income. This is excluded from the analysis, as already explained in the previous chapter.

²⁸ Political obstacles are often stated as the main obstacle for tax reliefs' abolishment. It is about interest groups – reliefs beneficiaries that give strong resistance to their abolishment.

²⁹ The already stated OECD member countries analysis came to the similar conclusion, pointing out that reliefs for saving/investment in real estate (mortgage interest) as well as pension saving have not only persisted for more than twenty years, but have even grown during the last decade (OECD, 2010a:66).

ificantly restricted non-standard reliefs.³⁰ Some of these countries have retained such taxation until recently (for instance Bosnia and Herzegovina until 2008), while some countries apply classical comprehensive income tax for high incomes only (for instance Serbia).

Non-standard reliefs are considerably less present in this group of countries than in the former group. Based on current data (2011), it is obvious that Montenegro, Kosovo, Macedonia, Serbia, Slovakia and recently Hungary, as well as Croatia (with the exception of charitable contributions) have completely accepted the negative attitude toward non-standard reliefs (their inefficiency and inequity). A question could be raised about why non-standard reliefs do not exist in these countries. Is it the result of the traditionally undeveloped tax (and economic) systems of these countries (which could be supported by the 2006 data in table A2)? Or does it mean that these countries (in contrast to the more developed EU-15 countries) have accepted contemporary tax policy recommendations (against those reliefs) more consistently? It is obvious that both of the causes have played a significant role, since they are complementary. Concerning the latter, the introduction of a flat tax in these countries should be mentioned (in contrast to the EU-15). It is well known that the classical flat tax model excludes non-standard reliefs (although its practical implementation has different deviations). So, the countries that in principle do not have non-standard reliefs (with the exception of Slovenia and Croatia) are flat tax countries also (Serbia, however, introduced a flat tax in 2003, but abandoned it in 2007). Albania is the only flat tax country that still recently introduced some of those reliefs. As already pointed out, Croatia (with the exception of charitable contributions) and Slovenia have abolished those reliefs without having introduced a flat tax.

The rest of the analysis concentrates on the remaining countries that provide non-standard reliefs and their comparison with the EU-15. It seems that, in comparison with the EU-15, employment income is mostly discriminated against, since these countries provide neither commuting expenses relief nor other relief for concrete, absolutely work-related expenses. Still, some progress concerning lump sum relief for work-related expenses (employment income) should be emphasized (this relief is not encompassed with the research since it is considered the standard relief).³¹

³⁰ Taxation of “Summed income of individuals” in the former Yugoslavia could be regarded as an exception only conditionally, because such comprehensive/synthetic taxation, which included non-standard reliefs also, was applied only to high incomes (higher than three times the average wage). A similar system is now in effect in Serbia.

³¹ Tax approved lump sum work-related expenses (tax reliefs for employment) did not exist in these countries in 2006 (Blažić, 2006:144-146). In the meantime Hungary, Poland and Romania have introduced them and still (2011) have them, while Slovakia provides basic personal relief (exemption/tax allowance) only for employment income and business income as well as tax credit for children only for employment income above a certain threshold (IBFD, 2012). The Czech Republic plans to introduce tax credits for employment income in 2015 (IBFD, 2012).

As with the EU-15, these countries in principle provide relief for pension insurance contributions/premiums, but provide the relief for life insurance premiums much more rarely. Almost all countries provide relief for charitable contributions and slightly fewer of them provide relief for medical expenses.³² Around half of these countries (that provide non-standard reliefs) also provide relief for interest payments, especially for mortgage interest. It is logical that this relief is not provided for other investment forms, since their capital incomes are mostly not taxed at all. Among other reliefs, the relief for students could be pointed out.

All the countries use tax allowances that are limited in principle, mostly because of fiscal but also because of vertical equity considerations.

The 2006-2011 data comparison reveals that, in contrast to the EU-15, the number of reliefs abolished considerably exceeds the number newly introduced. Only Albania (which previously had had a completely undeveloped system of personal income tax reliefs) and Bulgaria went in the opposite direction. The former introduced new reliefs and the latter maintained all previous reliefs and introduced one new relief. The remaining countries, with Croatia in the forefront, have mostly abolished tax reliefs (in Hungary partially substituted for by cash transfers). Accordingly, there are more countries without non-standard reliefs now (in 2011) than in 2006, when only Serbia and Montenegro, Albania and Macedonia belonged to that group. This could be explained by the already mentioned flat tax introduction, but not entirely. Furthermore, it is obvious that not only have these countries decided to follow modern tax policy recommendations, but that interest group resistance in these countries is weaker, giving them more manoeuvring space. A question could be raised as to whether the repeal of these reliefs is based on detailed cost-effectiveness analyses (including equity issues also) or whether it is merely the result of efforts at fiscal consolidation, which are accompanied by revenue-neutralizing rate lowering. But it is obvious that such a dilemma is obsolete if not irrelevant (OECD, 2010a).

6 NON-STANDARD RELIEFS IN CROATIA

The Croatian situation concerning non-standard tax reliefs is characterized by repeated radical changes. Instead of a detailed analysis of the particular reliefs, especially concerning their cost-effectiveness analysis as well as analysis of their other aspects, the “global” approach has been implemented in principle. From the implementation of a modern income tax system in Croatia in 1994, non-standard reliefs in the country have passed through an interesting development path, which is characterized by a vicious circle of extreme solutions. It started with their non-existence inside the personal income tax through the introduction of almost all of them and finished with the abolishment of almost all of existing reliefs (except

³² It is interesting that Hungary, which completely abolished non-standard reliefs, still substituted cash transfers for tax credits (for voluntary contributions/premiums of pension, life and health insurance). This indicates that their repeal is only formal.

that for charitable contributions). This is presented in detail in the remaining part of this chapter.

As is known, the 1994 personal (and corporate) income tax reform was consumption based. It was characterized by “interest-adjusted personal (and corporate) income tax” (Rose and Wenger, 1992).³³ In accordance with consumption based taxation (as well as tax reform demands from the eighties for developed countries that had spread into the transition countries also), a strong attitude against non-standard reliefs was present. This was completely implemented in the Croatian personal income tax system.

But after a couple of years the first relief in the form of tax allowance (in the form of already existing standard tax reliefs in Croatia) for charitable contributions in art and culture, and later in sport, was introduced. The fragmentary introduction of this, probably mostly justified³⁴ relief, was not brought by tax legislation, but by specific activities’ legislation. The partial introduction of this relief was obviously not motivated by criteria of efficiency³⁵, but by the influence and strength of other elements that initiated the stated legislative changes. Such fragmentation led to the tax discrimination of other forms and (possible) recipients of charitable contributions (especially humanitarian, scientific and educational institutions).

³³ In contrast to this “alternative model”, the “standard” model of consumption concept includes the “savings adjusted personal income tax” at individual level, followed by the “cash-flow tax” at the corporate level.

³⁴ Although this is the relief in the narrowest sense, i.e. “interventionist” type relief, which is not relief justified by objective or subjective net principle (ability to pay principle), there are still additional equity reasons in favour of the right to this relief. Such expenses are justified personal expenses (Dodge, 1989:122-123), i.e. expenses that present inability to contribute to the redistributive function of the state. To the group of such expenses not only those expenses that represent existence and nondiscretionary expenses could be classified, but also those expenses that are part of the non-government social redistribution scheme that has the priority in comparison to the government ones. This other reason is related right to the charitable contributions and follows from the first one, which makes the argument in favour of this relief especially strong (Dodge, 1989a, 125-126). The ability to pay principle arises, namely, from the understanding of government as the instrument of wealth redistribution and the provision of public good. That is why this relief could be advocated for its redistributive effects and provision public goods, regardless of the amounts being part of the ability to pay, its voluntary element and existence needs. The next argument in favour of this relief is so called “needs principle” (“Bedarfsprinzip”) (for instance Tipke, 1993:361-417, 713-742) and the equity argument understood as “reward”, but also “incentive” for socially desirable forms of consumption (for instance Kiesling, 1992:119; Mijatović, 2007:297). This is already related to the effectiveness of this relief, i.e. it is effective if the desirable activity incentive effect is realized at the minimum possible cost (revenue lost, i.e. tax expenditures). Empirical researches imply the efficiency of that relief related to its elasticity, although they are not completely unambiguous (Blažić, 2006:150-151), which implies the necessity of specific cost-effectiveness analyses for each country and situation (Blažić, 2000). Among other arguments those related to democratization and pluralist society strengthening through decentralization and some sort of competition in financing different activities could be pointed out. It is mostly not about pure public goods, but merit goods and therefore it is desirable for the budget to be released from such expenditures (that are otherwise financed through charitable contributions). Since such goods could not be adequately placed through the market, private financing through charitable contributions is the optimal “in-between mechanism”. Of course, a question could be raised about the adequacy of the location of such goods through private sector decisions. That is why public sector control is necessary and it is performed properly by shaping and targeting this relief (see footnote 36).

³⁵ The incentive effect for some other charitable contributions – for instance humanitarian ones (or maybe scientific and educational ones) would obviously be greater.

Of course, the chosen solution was in contrast to the usual situation in contemporary tax systems, where relief for such charitable contributions is general.³⁶

Tax reform from 2001 was formally a departure from the consumption concept in the direction of the income concept.³⁷ Although this should not have automatically implied a positive attitude towards reliefs, more and more reliefs were gradually included. This was influenced not only by the tax systems of the EU-15 (and other developed countries), but also by the tax systems of some of the EU-12. Furthermore, the already stated arguments in favour of particular non-standard reliefs could not be avoided. Some of them enable the fulfilment of the subjective net principle (ability to pay principle), but even the objective net principle. This justifies them from the aspect of equity (this is especially true for the relief for medical expenses and in a broader sense the relief for the voluntary health insurance) as well as efficiency (this is especially true for the already analysed relief for charitable contributions).³⁸ Finally, the reasons for the reliefs' introduction were the influences of different interest groups, which used EU tax practice as strong argument.

So, it is no wonder that these reliefs were introduced without significant cost-effectiveness analyses or analysis of horizontal and vertical equity or fiscal and tax compliance effects.³⁹ The following reliefs were thus introduced: tax allowances for other charitable contributions, life insurance premiums, additional and voluntary health and pension insurance premiums, other medical expenses, buying or building a first home, home maintenance, mortgage interest and 50% of rental fees. The stated reliefs are presented in table A2 in appendix according to the non-standard reliefs synthesis for EU countries.⁴⁰

A look at table A2 reveals that Croatia has applied all basic types of non-standard reliefs, i.e. that in comparison with the EU-15 only some non-standard reliefs were “missing” – for instance relief for commuting expenses as well as some “other” expenses like these for moving expenses, education, home work, etc.

Concerning the stated “generous” application of reliefs, which started to show strong negative fiscal effects, sweeping restrictions on and even the repeal of some reliefs were proposed for the tax reform in 2005. But, in the end the reform was reduced only to setting an upper limit (ceiling) for almost all non-standard reliefs taken together, caused mostly by fiscal reasons (so called “mini reform”).

³⁶ It is usual that such relief is limited to approved relevant institutions as recipients, as well as approved activities. However, it is not usual to narrow such relief to such a small number of activities/recipients.

³⁷ However, the system, however much of a hybrid it was, still remained mostly inside the consumption concept (and its alternative model).

³⁸ For more detailed equity and efficiency arguments see for instance: Blažić (2006:132-135, 147-152); Mijatović (2007:294-299), and the further listed references there.

³⁹ One of the rare attempts was in Blažić (1999).

⁴⁰ For the detailed review of the stated reliefs, as well as the other tax expenditures and their changes see: Šimović (2012:59-60).

Up to this moment (the situation presented in table A2 for 2006 was not changed significantly until 2010) Croatia has taken a path relatively in contrast to that advocated by contemporary financial science and tax reform from the end of eighties, whose requirements were renewed right by the economic crisis and fiscal consolidation problems. It has gradually and constantly introduced new reliefs, which is partially understandable, taking into the consideration the different starting position of Croatia in comparison to most of the developed countries.

But, in the middle of 2010 Croatia abolished all non-standard reliefs, with the exception of that for charitable contributions (Government of the Republic of Croatia, 2010:13⁴¹). The reasons for the repeal of these reliefs are complementary to those of the tax reform from the mid-1980s: horizontal and vertical inequity, inefficiency, administrative complexity and the most important reason, the fiscal, i.e. the tax revenue loss (tax expenditures) connected with these reliefs. Following the classical reform recommendations shortly presented at the beginning of this paper the reductions in tax expenditures, i.e. the rise in tax revenues of the income tax based on the repeal of these reliefs is used for the reduction of statutory tax rates, first of all of the lowest rate (from 15% to 12%) and the abolition of the highest rate of 45%.⁴²

There are few analyses of the effects of the reliefs from that period. The calculations of tax expenditures (revenue forgone) resulting from these reliefs, which pointed out their negative fiscal effects are more systematic (Bratić and Urban, 2006; Bratić, 2006; and afterwards Šimović, 2012b). One of the rare analyses was one about vertical equity, i.e. progressivity (Urban 2006a; 2006b). This analysis, which used the methodology for measuring the influence of different elements of personal income tax on progressivity applied to OECD countries by Wagstaff and van Doorslaer (2001), showed the negative influence of these reliefs (together with all other tax allowances) on progressivity (Urban, 2006a:2; 2006b:217-221). It was actually the decrease in progressivity, i.e. the fact that these allowances benefited higher income groups, that mostly influenced the decision of the Government of the Republic of Croatia (2010:13) to abolish them. Perhaps before the decision to repeal, some rethinking was needed and a thorough cost-effectiveness analysis (among other considerations) of existing reliefs should have been undertaken. This could have resulted in the abolition of some reliefs and a transformation of the (some of) existing reliefs into tax credits, which are more equitable than tax allowances. Maybe even further transformation into income related reliefs or even “phasing out” reliefs or some combinations of all the stated transformation possibilities should have been considered. This could, of course, have

⁴¹ In the stated document the abolishment of all non-standard tax reliefs was mentioned, except of those for research and development. Since these reliefs are allowed as the part of personal income tax concerning business income taxation, they are not part of this research. Although the mentioned abolishment encompasses all the reliefs, the current legislation has still kept the relief for charitable contributions.

⁴² It is also necessary to mention that the stated revenue loss was partly compensated by the reorganization of tax brackets.

increased the complexity of reliefs, so maybe this was the crucial element influencing their repeal.

Although the horizontal inequity of the reliefs was put forward as one of the *a priori* arguments for their abolishment⁴³, it is directly analyzed and presented later also, especially concerning different income types (Šimović, 2012a; 2012b).

So, by repealing all non-standard reliefs (with the exception of those for charitable contributions) Croatia closes the circle, coming back to its starting position (1994), with the exception of the relief for charitable contributions. As already pointed out, the first reliefs that were introduced in the starting model from 1994 were actually the reliefs for charitable contributions.

Whether a second round of gradual reliefs' introduction follows up or it would be prevented solely by fiscal consolidation priority remains an open question. It is an open question whether a second round of the gradual introduction of reliefs is to follow or whether this will be ruled out by considerations of fiscal consolidation.

7 CONCLUSION

Despite long-lasting and recently renewed demands to limit and abolish most non-standard reliefs, they still play a significant role in contemporary income tax systems. Furthermore, while previous efforts from the end of the 1980s and early 1990s were directed not to their abolition but to their limitation, by introducing upper limits and repealing only some particular reliefs, newer (2011 in comparison to 2006) EU-15 trends imply even some indications of their increase. Although they could be related to the initial reactions to the economic and financial crisis (however, most of such reactions were related to a decrease in personal income tax rates, standard reliefs of personal income tax as well as corporate income tax incentives) it seems that not even fiscal consolidations had significantly brought about any decrease in non-standard personal income tax reliefs in the EU-15 by the end of 2011. It has been proved again that, once introduced, reliefs are extremely hard to abolish and that there are constant efforts for their reintroduction as well as introduction of new reliefs.

The situation in the analyzed EU-12 (all except the Baltic countries, Malta and Cyprus) and the countries of the region is significantly different. Not only were

⁴³ It could be rather confusing that the reliefs are at once claimed to increase the horizontal equity of the personal income tax and blamed for decreasing it. The reason lies in the different starting points, i.e. the concepts (and related measurements) of this equity as well as the stated reliefs. The first concept starts from the subjective (and objective) net principle, pointing out that two people do not have the same ability to pay if they both have the same income level and one of them has high, nondiscretionary and unavoidable medical expenses for instance. In that case, the ability to pay of that person is significantly lower. The opposite concept starts from the income subject to tax (statutory income) as relevant tax base and measure of ability to pay (equity and equality) and all the departures from it through different reliefs are claimed to distort that concept. It is obvious that these two understandings and measurements have an *a priori* embedded attitude in favour of or against tax reliefs.

non-standard personal income tax relief systems less developed than in the EU-15, but a significant repeal of reliefs took place in the observed period. Almost half of the countries analyzed (including Croatia) have no non-standard reliefs at all (end of 2011), which was strongly influenced by the flat tax introduction. But this reason is not the only one, since Croatia and Slovenia, which rejected this form of tax, still abolished all non-standard reliefs, and the reverse happened in Albania. It is obvious that economic (and tax) policy creators in those countries are strongly convinced of the necessity for the repeal of such reliefs, but are also able to implement their tax changes easier.

Croatia has gone along an interesting development path concerning non-standard personal income tax reliefs – from their non existence until full application and back. With the latest changes it joined the dominant situation as well as trends in the countries of the region (including the EU-12). These countries have never had developed non-standard relief systems or have not had them at all. Some of them that had developed such reliefs abolished them mostly simultaneously by the introduction of a flat tax or by following the contemporary tax policy recommendations even more strongly than the EU-15.

APPENDIX

TABLE A1
Non-standard reliefs in the EU-15 (2006-2011)

Year	Voluntary pension insurance contrib.	Life insurance contrib.	Medical expenses	Commuting expenses	Charitable contributions	Interest payments	Others
2006	-	FTA (C) p.o.	TA for extremely high costs, (1%)	F _x C+TA for longer distances (TA depends on distance)	-	FTAO (C) p.o.	FTA (C) for newly issued shares, p.o., TA for extremely high educational costs (1%), F _x TA for the educational expenses of child outside its residence
2011	-	FTA (C) p.o.	TA for extremely high costs, (1%)	F _x C+TA for longer distances (TA depends on distance)	FTA (C, 1%)	FTAO (C) p.o.	FTA (C) for newly issued shares, p.o., TA for extremely high educational costs (1%), F _x TA for the educational expenses of child outside its residence
2006	PTC (C)	PTC (C)	-	-	PO (80%)	FTA – mortgage interest for owner occupied dwelling (C)	PTC for employee share schemes (C), PTC (C) for the repayment of mortgage loans, PTC for the building/maintenance/buying residence with energy saving, PTC (C) for automobiles with lesser pollution emission and bonds (venture capital)
2011	PTC (C)	PTC (C)	-	-	F _x TA	FTA – mortgage interest for owner occupied dwelling (C)	PTC for employee share schemes (C), PTC (C) for the repayment of mortgage loans, PTC for the building/maintenance/buying residence with energy saving, PTC (C) for automobiles with lesser pollution emission and bonds (venture capital)
2006	FTA (C)	FTA	-	FTA	FTA (C and lower threshold)	FTA	PTA (above lower threshold) for the work-related expenses
2011	FTA (C)	FTA	-	FTA	FTA (C and lower threshold)	PTA (C)	PTA (above lower threshold) for the work-related expenses

Year	Voluntary pension insurance contrib.	Life insurance contrib.	Medical expenses	Commuting expenses	Charitable contributions	Interest payments	Others
Finland							
2006	FTA (C)	–	See last column	FTA (C and lower threshold)	–	FTA	FTA (C) for the “decrease in ability to pay tax” (sickness, unemployment, alimony payment); PTC (C) for the maintenance of immovables, FTA for work-related expenses (or lump-sum TA), <i>FTA for trade union fees</i>
2011	FTA (C)	–	See last column	FTA (C and lower threshold)	TA (lower threshold and C) for high education	FTA	FTA (C) for the “decrease in ability to pay tax” (sickness, unemployment, alimony payment); PTC (C) for the maintenance of immovables, FTA for work-related expenses (or lump-sum TA), FTA for renting flat because of the distant working place <i>FTA (C) for losses at specific shares</i> , FTA for qualifying direct investments in certain French Overseas Departments, FTA (C) for union membership fees, PTC (C) for investment in specific shares, PTC (C) for energy saving housing equipment, F_C for education expenses of children (the height depends on the type of educational institution)
2006	FTA (C)	–	–	FTA for moving expenses	PTC (C, 1%)	<i>FTA (C) for investment in non quoted companies</i>	FTA for qualifying direct investments in certain French Overseas Departments, FTA (C) for union membership fees, PTC (C) for investment in SMEs and innovative funds’ shares, PTC (C) for energy saving housing equipment, F_C for education expenses of children (the height depends on the type of educational institution)
France							
2011	FTA (C, 1%)	–	–	FTA for moving expenses	PTC (C, 1%)	PTC (C) for owner occupied housing, > for energy saving	FTA for qualifying direct investments in certain French Overseas Departments, FTA (C) for union membership fees, PTC (C) for investment in SMEs and innovative funds’ shares, PTC (C) for energy saving housing equipment, F_C for education expenses of children (the height depends on the type of educational institution)

Year	Voluntary pension insurance contrib.	Life insurance contrib.	Medical expenses	Commuting expenses	Charitable contributions	Interest payments	Others
2006	PTA (C)	PTA (C)	FTA (lower threshold)	F _x TA according to km (C) or FTA; FTA for moving expenses also	FTA (C) or (C, 1%) depends on type of donation, PTC for donations to political parties	FTA ili F _x TA	F _x TA for occupational training of children, FTA (C) for a taxpayer's first professional education or his first studies, FTA for the church tax
	PTA (C)	PTA (C)	FTA (lower threshold)	F _x TA according to km (C) or FTA; FTA for moving expenses also	FTA (C) or (C, 1%) depends on type of donation, PTC for donations to political parties	FTA ili F _x TA	F _x TA for occupational training of children, FTA (C) for a taxpayer's first professional education or his first studies, FTA for the church tax
2006	–	FTA (C)	PTC (C)	–	FTA (C, 1% for some donations)	PTC for mortgage interest (C based on m ²)	PTC (C) for the annual home rent, PTC (C) for the educational expenses of taxpayers and their children, PTC (C) for investments in Greeks investments funds, PTC (C) for ecologically acceptable energy sources of households
2011	–	FTA (C)	PTC (C)	–	FTA (C, 1% for some donations)	PTC for mortgage interest (C based on m ²)	PTC (C) for the annual home rent, PTC (C) for the educational expenses of taxpayers and their children, PTC (C) for investments in Greeks investments funds, PTC (C) for ecologically acceptable energy sources of households

Germany

Greece

Year	Voluntary pension insurance contrib.	Life insurance contrib.	Medical expenses	Commuting expenses	Charitable contributions	Interest payments	Others
2006	–	PTC (C)	PTC (lower threshold), PTC (C) for voluntary health insurance contributions	–	–	PTC (C) for mortgage interest on owner-occupied dwelling	PTC (C) for educational expenses
Italy							
2011	FTA (C)	PTC (C)	PTC (lower threshold), FTA for costs of help to disabled , PTC (C) for voluntary health insurance	–	FTA (C), PTA / FTA (C)	PTC (C) for mortgage interest on owner-occupied dwelling	PTC (C) for educational expenses, PTC (C) for real estate agents , PTC (C) for lower incomes , PTC (C) for owner occupied dwelling improvement
2006	FTA (C) – depends on age)	FTA (C)	FTA (lower threshold, 1%), FTA (C) for voluntary health contributions	F _x TA (according to km-C)	FTA (C/C, 1%)	FTA (C) except mortgage interest	FTA (C) for educational costs of children, FTA (C) for housing saving, FTA (C) for accident insurance premiums
Luxembourg							
2011	FTA (C) – depends on age)	FTA (C)	FTA (lower threshold, 1%), FTA (C) for voluntary health contributions, FTA (lower threshold, 1%) for disabled	F _x TA (according to km-C)	FTA (C/C, 1%)	FTA (C) except mortgage interest	FTA (C) for educational costs of children, FTA (C) for housing saving, FTA (C) for accident insurance premiums

Year	Voluntary pension insurance contrib.	Life insurance contrib.	Medical expenses	Commuting expenses	Charitable contributions	Interest payments	Others
Netherlands	2006	FTA	FTA (lower threshold or C, I%) – voluntary health contributions included	F _x TA (according to km-C)	FTA (C and lower threshold or C, I%)	FTA mortgage interest for owner occupied housing	FTA for educational expenses
	2011	FTA	FTA (lower threshold)	F _x TA (according to km-C)	FTA (C and lower threshold or C, I%)	FTA mortgage interest for owner occupied housing	FTA for educational expenses
Portugal	2006	PTC (C – depends on age)	PTC (C) for health insurance also	–	PTC (C, I%)	PTC (C) mortgage interest	PTC (C) for educational expenses, PTC (C) for rent costs / depreciation, PTC (C) for investments in energy saving equipment and computers; 150% TA for trade union membership fees (C, I%)
	2011	PTC (C – depends on age + I%)	PTC (C, I%) for health insurance also	–	PTC (C, I%)	PTC (C, I%) mortgage interest	PTC (C) for educational expenses, PTC (C) for rent costs, PTC (C) for investments in energy saving equipment, PTC (C, I%) for investments in state bonds
Spain	2006	FTA (C)	–	FTA	PTC	See last column	PTC (C) for mortgage debt repayment and buying/maintaining owner occupied dwelling, FTA for trade union and professional organization membership fees
	2011	FTA (C)	–	> lump sum relief if the working place is in other town	PTC	See last column	PTC (C) for costs of buying/maintenance of owner occupied dwelling, FTA for trade union and professional organization membership fees, FTA for different insurance forms

Year	Voluntary pension insurance contrib.	Life insurance contrib.	Medical expenses	Commuting expenses	Charitable contributions	Interest payments	Others
2006	FTA (C)	–	–	FTA (lower threshold), FTA for moving expenses	–	FTA	–
2011	FTA	–	–	FTA and FTA for moving expenses	–	FTA	FTA (lower threshold) for administrative costs connected with acquiring capital income, PTA (C) for the services of residence building and maintenance
2006	FTA (C)	–	–	–	FTA	FTA for investment in shares	FTA for work related expenses, FTA for educational expenses, FTA (C) for saving accounts, TA for qualifying companies or investment funds shares
2011	FTA (C)	–	–	–	FTA	FTA for loans and shares	FTA for work related expenses, FTA for educational expenses, FTA (C) for saving accounts, TA for qualifying companies or investment funds shares

UK
TA – tax allowance (deductions and exemptions from the tax base); F_xTA – fixed TA; PTA – partial TA; FTA – full TA.

TC – tax credit (deduction from the tax due); F_xTC – fixed TC; PTC – partial TC (part of the costs); TC, I% – TC is part (percentage) of the personal income; “non wastable” – the part of the TC that exceeds tax due is not “lost” (the difference is paid to the taxpayer as transfer).

C – ceiling (upper limit/threshold) for the reliefs (above that ceiling the relief – cost is not recognized for the tax purposes), CI% – C (or a lower threshold) is expressed as income percentage.

I% – denotes in general that a relief or its ceiling (C) is income related – part (%) of income (in general: lower income implies higher relief).

p.o. – phasing out (the relief diminishes gradually with the income rise).

New reliefs in 2011 in comparison with the 2006 are bolded (as well as the changes in the existing reliefs – new elements inside the modifications – see under: modifications). Abolished reliefs are written in italic letters.

Modifications of the already existing reliefs (2006 in comparison to 2011) are shaded.

TABLE A2
Non-standard reliefs in some EU-12 and countries of the region (2006-2011)

	Year	Voluntary pension insurance contributions	Life insurance contributions	Medical expenses	Charitable contributions	Interest payments	Others
Albania	2006	-	-	-	-	-	-
	2011	FTA (C)	-	FTA	-	FTA for education	-
Bulgaria	2006	FTA (C, I%)	FTA (C, I%)	FTA (C, I%) for voluntary medical insurance	FTA (C, I%)	-	FTA (C) for voluntary unemployment insurance
	2011	FTA (C, I%)	FTA (C, I%)	FTA (C, I%) for voluntary medical insurance	FTA (C, I%)	FTA (C) for mortgage interest of young families	FTA (C) for voluntary unemployment insurance
B&H (Fed.) (RS)	2011	FTA (C)	FTA (C)	FTA	-	FTA mortgage int. for owner occupied dwelling	-
	2006	<i>FTA (C)</i>	<i>FTA (C)</i>	<i>FTA (C) for voluntary medical insurance</i>	FTA (C)	<i>FTA (C) for mortgage interest</i>	<i>FTA (C) for building/maintenance of residence, FTA (C) for rent payments</i>
Croatia	2011	-	-	-	FTA (C)	-	-
	2011	-	-	-	-	-	-
Czech Republic	2006	FTA (lower threshold + C)	FTA (C)	-	FTA (lower threshold + C)	FTA mortgage int. for owner occupied dwelling	F _x TA for students
	2011	FTA (lower threshold + C)	FTA (C)	-	FTA (lower threshold + C)	FTA mortgage int. for owner occupied dwelling	F _x TA for students

Year	Voluntary pension insurance contributions	Life insurance contributions	Medical expenses	Charitable contributions	Interest payments	Others
Hungary	2006	PTC – transfer from '06	PTC (C) for voluntary health insurance – transfer from '06	PTC (C) p.o.	See on the right	DK (G) p.o. for education (of taxpayer and his children) and computer buying, PTC (C) for mortgages repayment
	2011	Transfer instead of PTC	Transfer instead of PTC	-	-	-
Macedonia	2006	-	-	-	-	-
	2011	-	-	-	-	-
Poland	2006	-	-	FTA (C, 1%), PTC (C, 1%)	FTA (C) for mortgage interest	FTA (C) for the costs of internet admission
	2011	-	-	FTA (C, 1%)	-	FTA (C) for the costs of internet admission
Romania	2006	FTA (C)	FTA (C) for voluntary medical insurance	-	-	FTA (C) for owner-occupied dwelling's insurance premiums
	2011	FTA (C)	-	-	-	FTA for trade union membership fees
Serbia and Montenegro	2006	-	-	-	-	-
Serbia	2011	-	-	-	-	-
Slovakia	2006	FTA (C)	-	-	-	FTA (C) for long-term saving
	2011	-	-	-	-	-
Slovenia	2006	-	FTA (C, 1%)	FTA (C, 1%)	-	FTA (C, 1%) for investment in long-term securities and shares, for buying/maintenance of the residence, for maintenance of cultural inheritance, for buying work of arts, books and scholarships
	2011	DO (G, VD and G)	-	-	-	FTA for students

Note: Same as in the table A1.

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The relationship between the stock market and foreign direct investment in Croatia: evidence from VAR and cointegration analysis

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Abstract

The aim of this paper is to investigate the existence and characteristics of both the long- and short-term relationships between FDI and the stock market in Croatia. The main hypothesis is that, in the long run, trends in FDI should determine the movement of the stock market through the channel of economic growth. However, in the short run, upward movement on the stock market positively affects Croatian FDI stock, as events on the stock market signalize the vitality and investment climate of the domestic market to foreign investors. The long-term connection is tested by two cointegration approaches; the results of both models suggest the absence of a long-term relationship among observed variables, which may be explained by the lack of connection between FDI and economic growth in Croatia. The short-run relationship is investigated by a two-variable VAR model, and the results obtained are consistent with the theoretical assumptions, as the stock market did prove to be an important short-term determinant of FDI in Croatia.

Keywords: VAR, cointegration, foreign direct investment, stock market, Croatia

1 INTRODUCTION

Faced with the lack of domestic capital required to achieve high growth rates, the countries of Central and Eastern Europe, including Croatia, turned to foreign sources of financing during the transition from a centrally planned to a market economy in the beginning of the 1990s. The dominant form of foreign capital inflows during this period was foreign direct investments (FDI), which, due to their characteristics, may have many positive effects on the host economy (Blomström, Lipsay and Zejan, 1992; Borensztein, De Gregorio and Lee, 1998; Bosworth and Collins, 1999; Loungani and Razin, 2001; etc.). Theoretical assumptions regarding the characteristics of FDI emphasize the stability, long-term motivation and resilience of this type of capital investment, even during financial crises (Lipsey, 2001). On the other hand, stock market and portfolio investments are characterized as short-term, speculative and, thus, prone to quick disinvestment and capital flight. In spite of these significant differences between the two types of capital flow, previous empirical research (Errunza, 1983; De Santis and Ehling, 2007; Adam and Tweneboah, 2008a, b; Yartey, 2008; Soumaré and Tchana Tchana, 2011) has proven the existence of a connection between FDI and portfolio investments. However, the underlying interlinkages and the direction of the causality still remain insufficiently clarified.

The purpose of this paper is to explore the existence and unravel the characteristics of the relationship between long-term (FDI) and short-term (stock market) investments in Croatia. The paper empirically examines the strength and the direction of the relationship between the two variables in the long run by using the Engle-Granger and Johansen cointegration methodology. In the long run, FDI should, through the transfer of know-how and technology, influence economic growth and, indirectly, capital markets. Alternative explanations of this long term

relationship include the assumption that the presence of FDI inflows causes spillover effects on the domestic stock market and encourages policy makers to adopt market-friendly regulations, which encourage stock trading. In addition, we test for the existence of the short-term relationship between FDI stock and trading volume through the vector autoregressive (VAR) model approach. In the short run, assumed direction of the connection stems from events on capital markets which send signals regarding the domestic investment climate to foreign investors, and thus affect FDI. Hence, the direction of causality in the short run should be reversed. Therefore, the main hypothesis of the paper is that, in the long run, trends in FDI flows influence trading on the Croatian stock market, while in the short run events on the domestic stock market affect the volume of foreign direct investment in Croatia.

The rest of the paper is organized as follows. The introduction is followed by a review of the literature in which, in addition to the conclusions of prominent papers on the linkage between FDI and the stock market, the basic theoretical knowledge about the characteristics of both types of investments is presented. Also, it deals with the question of causality between FDI and stock markets. The third section describes the data and methodology used in the empirical research. The fourth section presents the findings of the empirical model, while the final section concludes the paper.

2 LITERATURE REVIEW AND THEORETICAL ARGUMENTS

At the beginning of the transition process, countries of Central and Eastern Europe, including Croatia, faced a situation of significant unemployment growth, high inflation and a decline in industrial production. Unable to finance the needed investments domestically due to the low levels of national savings, these countries looked to foreign capital to restructure the economy, intensify investment projects, finance growing domestic demand and sustain economic growth during the transition period. The dominant type of foreign capital inflows in that period were foreign direct investments.

FDI inflows into Croatia had an upward trend from the beginning of the transition period, but a significant rise in investment was marked only after the opening of accession negotiations with the European Union in 2005 (graph 1). Moreover, FDI has been the most important source of financing of the current account deficit in Croatia. However, the most significant amount of foreign capital has entered Croatia through the privatization process, i.e. through take-overs and recapitalizations of Croatian enterprises and banks. Such sources of financing are not sustainable in the long run (Jovančević, 2008). If the sectoral structure of foreign direct investment into Croatia is observed, it will become evident that the bulk of FDI inflows have entered non-manufacturing sectors – financial intermediation, wholesale trade, real estate business, the postal and telecommunications sector, and retail. At the beginning of 2011, the stock of investment into manufacturing sectors

accounted for less than one fifth of total foreign direct investment into Croatia. Such a sectoral structure limited the positive effects of foreign direct investment on employment and economic growth in Croatia (Jovančević and Globan, 2011).

Differences between FDI and portfolio investments¹, whose equity component is represented by investments on stock markets², primarily result from different motivations of investors. Due to the taking of control and/or acquisition of significant influence in corporate governance, foreign direct investments are distinctly motivated and behave differently from other forms of investments. FDI inflows typically involve a long-term relationship between foreign investors and host companies, i.e. involve a long-term interest of foreign capital investors in the company (UNCTAD, 1999).

In contrast to direct investments, portfolio investors are usually not primarily interested in controlling and managing the enterprise, but rather in short-term capital gains. Accordingly, portfolio investments are characterized by frequent changes of ownership and places of investment, as well as by an anonymous relationship between the issuer and the holder of securities. Those investments are driven by investors' speculative expectations and due to their short-term character and the moral hazard that stems from it, portfolio investments are sometimes considered as unfavourable. That is, in the event of a financial crisis or negative expectations of investors, this type of capital is the first to flee the country and may cause serious disturbances at the micro and macro levels of the economy (Claessens, Dooley and Warner, 1995; Chuhan, Perez-Quiros and Popper, 1996; Rodrik and Velasco, 1999; Sarno and Taylor, 1999; etc.). Contrarily, FDI is considered more stable and secure (like "good cholesterol", according to Hausmann and Fernández-Arias, 2000) because it is, in theory, less susceptible to capital withdrawals and financial contagion. This is because the presence of large, fixed and illiquid assets, which comes with a direct investment, aggravates rapid disinvestment.

Although the volume of global capital flows has reached unprecedented levels over the past 20 years, the interrelationship and connection between FDI and portfolio investments has remained largely unclear. Despite the differences in character and motivation of the two types of investments, a relatively large number of empirical studies deals with the finding of causality and interlinkages between these two variables. Based on the empirical analysis, De Santis and Ehling (2007) conclude that the movements on the stock market are the most important determinant of FDI and portfolio transactions. The stock market affects the movement of FDI flows by producing signals that are important for corporate investment deci-

¹ According to International Monetary Fund classification, direct investments are investments through which the investor directly comes into the possession of capital that provides him 10 per cent or more of the voting rights in the company. On the other hand, in order for the investments to be considered as portfolio investments, the share of acquired capital in the form of securities (bonds, stocks, other securities issued by monetary or fiscal authorities, enterprises, banks, etc.) must not exceed 10 per cent of the total voting rights in the company (IMF, 2009).

² Debt component is represented by bond trading and other debt instruments.

sions via Tobin's Q theory. On the other hand, foreign and domestic stock markets determine portfolio investments because "they measure the investment opportunity set and wealth effects" (De Santis and Ehling, 2007, p.5). Also, authors found that information about the company's fundamentals is revealed through direct investments, which is then utilized by portfolio investors when making investment decisions. In other words, portfolio investors follow firms' investment decisions when making their own.

Adam and Tweneboah (2008b) highlight an indirect, but strong relationship between stock markets and FDI inflows. FDI inflows are a source of technological progress and increasing employment in most developing countries, which increases the production of goods and services and, ultimately, increases GDP. Economic growth then has a positive effect on the development of stock markets and the rise of share prices. Using the cointegration method, the authors found evidence of a long-term positive relationship between FDI and stock market development in Ghana. In another paper, the same authors examined dynamic linkages between stock markets and major macroeconomic indicators, and again found a positive and significant relationship between FDI and stock market in Ghana. They explained these trends by the opening of the domestic stock market to foreigners and Ghanaian non-residents which has attracted high-rank institutional investors and indirectly has increased FDI inflows (Adam and Tweneboah, 2008a). The long-term impact of FDI inflows on the development of domestic capital market and on the increase of investors' participation in stock exchange was established earlier by Errunza (1983), while Yartey (2008) stated that FDI promotes institutional and regulatory reforms which encourage greater confidence in the domestic capital market, which further increases the variety of investors and trading volume.

Opening the domestic stock market to foreign investors may reduce the risk premium in the country and thus further attract foreign investments, as proven by Oyama (1997) from the examples of Venezuela, Jordan and Pakistan. The interdependence of movement in the stock markets and FDI flows is particularly evident in periods of investment euphoria when stock indices grow significantly and investors are more inclined to make riskier investment decisions. Nonnemberg and De Mendonça (2004) argue that the growth in capital markets in advanced countries is a powerful determinant of investment outflows from these countries to abroad, especially in recent times.

Although economic theory assumes a positive relation between FDI and economic growth (and thus indirectly between FDI and the capital market), this connection in Croatia and some other transition countries has not been empirically confirmed. Mencinger (2003) concluded that the correlation between FDI and economic growth in transition countries is negative. His findings are explained by the fact that in these countries, instead of greenfield investments, acquisitions have

been the dominant form of FDI inflows which is why direct investment inflows have not had an impact on economic growth. Significant positive correlation between the two variables in transition countries failed to be empirically confirmed also by Šimurina (2006) and Bogdan (2009).

Soumaré and Tchana Tchana (2011) and Al Nasser and Soydemir (2010, cited in Soumaré and Tchana Tchana, 2011, pp.3-4) reach conclusions about the simultaneity and the bidirectional causal relationship between FDI and stock market development in developing countries. One of the explanations for this relationship consists of spillover effects on domestic stock markets brought by foreign direct investments, as FDI inflows increase the likelihood that the subsidiaries of multinational companies involved in direct investments will be listed on a domestic stock market. Other explanations include the assumption that the presence of FDI inflows encourages policy makers to adopt market-friendly regulations, like investor protection and quality trading regulations, which encourage the development of stock markets. Causality in the other direction is explicable by a welldeveloped stock market helping to attract foreign investors, a sign of vitality, a favourable investment climate and the openness of a country to foreign investments. This is especially true for emerging markets, whose stock markets are more developed than those in other developing countries (Desai, Foley and Hines, 2006; Soumaré and Tchana Tchana, 2011).

The existence of linkages between stock markets and FDI was also confirmed by Batten and Vo (2009) who found that FDI had a stronger positive impact on economic growth in countries with higher levels of stock market development. Capital markets can play an important role in determining the movement of cross-border mergers and acquisitions (M&A), which constitute an important part of FDI. Chousa, Tamazian and Vadlamannati (2008) found a strong positive relationship between the development and quality of capital markets and M&A flows in emerging economies. Empirical evidence showed that greater efficiency of domestic capital markets encourages foreign investors and attracts international M&A.

Baker, Foley and Wurgler (2009) explore ways in which FDI flows depend on the stock market movements in host and source countries. They find that FDI is very strongly positively correlated with movements on the source-country's stock markets, but also not strongly negatively connected with the movements on the host-country's stock markets. They point out that this asymmetry has at least two natural explanations. One is that "multinationals may have better information about their own cost of capital than about the cost of capital or misvaluations in foreign capital markets". The other is that "an asymmetric limit on arbitrage, such as a short-sale constraint, may increase the scope for FDI as a means to exploit overvaluation relative to undervaluation" (Baker, Foley and Wurgler, 2009, p.365). Feridun, Sawhney and Jalil (2009) step back from FDI and explore the existence of a long-term relationship between stock prices and business investment decisions

in Turkey. They prove the existence of a one-way positive causal relationship from stock prices to real business investments, while the reverse does not hold.

3 DATA AND METHODOLOGY

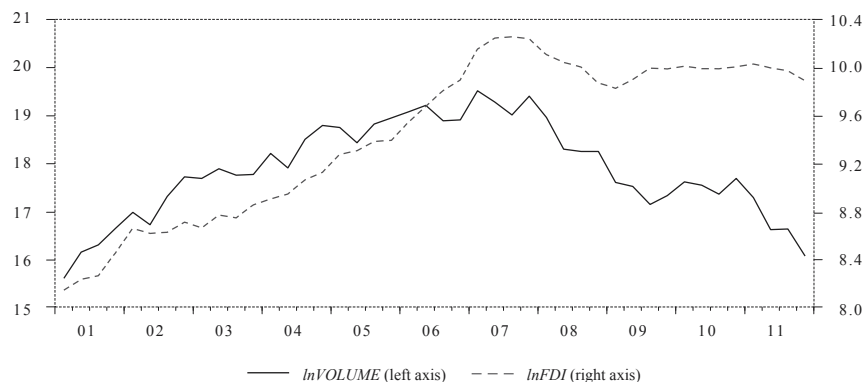
3.1 DATA SETS

In order to determine the relationship between stock market movements and FDI in Croatia, quarterly data on FDI stock and trade volume on the Zagreb Stock Exchange for the period 2001:Q1–2011:Q4 are used in the analysis. We opted for stock, rather than flow FDI data, since the former type is less volatile, it captures the longer-term trend in the foreign direct investment movement and is therefore more suitable for analysis.³ On the other hand, we chose trade volume series instead of stock market index, because stock market index and FDI stock series are correlated by construction. Namely, the methodology for calculating the FDI stock includes value adjustments which are performed using market prices of quoted stocks.

Graph 1 shows that variables *FDI* and *VOLUME* behaved procyclically and reached their highest points during mid-2000s, until the financial and economic crisis stopped their upward trend. The sharpest decreases in both variables happened at the end of 2008 and in early 2009 (concurrently with the bankruptcy of Lehman Brothers), when FDI and trade volume lost 30 and 70 per cent of their record-setting 2007:Q4 value, respectively.

GRAPH 1

FDI stock in Croatia and trade volume on ZSE in natural logarithms, 2001:Q1–2011:Q4



Source: CNB, ZSE.

³ FDI flow series is more volatile than FDI stock, stationary in levels and it takes both positive and negative values during the observed period. As an empirical exercise, we estimated the VAR model using FDI flow series. These results are not presented in this paper due to its low performance and issues with normality of residual distribution. Both Akaike and Schwarz information criteria pointed to a model with FDI stock instead of FDI flow.

FDI data are taken from the statistical database of Croatian National Bank (CNB), while the trade volume data were taken from the Zagreb Stock Exchange database. The variable *VOLUME* is constructed as a quarterly average of daily trade volumes. For the purpose of the analysis, both time series have been deflated by the CPI index (2005=100) and expressed in natural logarithms (graph 1).

3.2 METHODOLOGY

As stated earlier, economic theory suggests a possible bidirectional relationship between FDI and the stock market. In the short run, developments in stock markets may affect the decision of investors whether to invest abroad, i.e. may affect the amount of FDI inflows. A growth in stock markets and positive expectations are usually an indication of market vitality, a favourable investment climate and the openness of the country to FDI (Desai, Foley and Hines, 2006; Soumaré and Tchana Tchana, 2011). However, if the long-term impact of FDI on economic growth is channelled through the process of rapid technological progress, then the causality direction is reversed, because FDI then indirectly affects stock market movements (Adam and Tweneboah, 2008b).

For the estimation of the long-term relationship between the stock market trade volume and FDI, we used Engle-Granger and Johansen cointegration approaches. Engle and Granger (1987) presented the simplest approach to cointegration testing. Components of the vector x_t are said to be cointegrated of order d , b , $x_t \sim CI(d, b)$ if all components of x_t are integrated of order d and there exists a vector $\beta = (\beta_1, \beta_2, \dots, \beta_n)$ such that the linear combination $\beta x_t = \beta_1 x_{t1} + \beta_2 x_{t2} + \dots + \beta_n x_{tn}$ is integrated of order $(d-b)$ for $b > 0$. In other words, two non-stationary $I(1)$ variables are said to be cointegrated if the residuals of the regression equations are stationary, $I(0)$. Stationarity of the residuals is tested by conventional unit root tests such as the Augmented Dickey-Fuller test (ADF test). However, since estimates of the regression equation using the least squares method tend to minimize residuals, the critical values of the ADF test for testing the stationarity of residuals are lower than conventional tests and depend on the sample size, significance level and number of variables (MacKinnon, 1991).

Another approach in testing for cointegration was given by Johansen (1988, 1991), who described a multivariate cointegration analysis in which the vector error-correction (VEC) model is defined as follows:

$$\Delta Z_t = \Gamma_1 \Delta Z_{t-1} + \Gamma_2 \Delta Z_{t-2} + \dots + \Gamma_{k-1} \Delta Z_{t-k+1} + \Pi Z_{t-1} + u_t \quad (1)$$

where Z_t is a vector of n non-stationary $I(1)$ variables, Γ_i is the coefficient matrix defined as $\Gamma_i = (I - A_1 - A_2 - \dots - A_k)$ ($i = 1, 2, \dots, k-1$) representing short-run dynamics, and Π is $n \times n$ matrix defined as $\Pi = -(I - A_1 - A_2 - \dots - A_k)$ where I is the unit matrix whose rank determines the number of cointegrating vectors. The matrix Π contains information about the long-term relationships between variables. If Π is of full rank, then the variables in Z_t are stationary $I(0)$, and cointegration in this

case is not defined. If the rank of matrix Π equals zero, there is no cointegration relationship between the variables. However, if Π is of reduced rank, then the model has $r \leq (n-1)$ cointegrating relationships.

In order to examine the short-term relationship between the variables in question, we use the vector autoregression (VAR) model. This model is used to evaluate the dynamics among the variables. The model is represented by the following equation:

$$Z_t = \mu + \sum_{k=1}^p A_k Z_{t-k} + \Psi D_t + e_t \quad (2)$$

where Z_t is a vector of dependent variables, μ is a column vector of constants, A_k is a coefficient matrix, D_t is a vector of non-stochastic exogenous variables with the corresponding parameter matrix ψ , and e_t is a column vector of innovations. Vector D_t may contain binary variables, a trend or a seasonal component (Bahovec and Erjavec, 2009). In this paper, based on a theoretical assumption that, in the short term, events in the stock market impact FDI inflows, the Cholesky ordering of dependent variables is set as follows:

$$Z_t = \begin{pmatrix} \Delta \ln VOLUME \\ \Delta \ln FDI \end{pmatrix} \quad (3)$$

In a reduced form VAR, restrictions are set so that the variable $\Delta \ln FDI$ does not influence the variable $\Delta \ln VOLUME$ in the first period, but $\Delta \ln VOLUME$ can influence $\Delta \ln FDI$ even in the first period, which is in accordance with Cholesky ordering, where the lower triangular matrix is decomposed.

4 RESULTS

The analysis begins by testing the order of integration of variables. While the analysis of the VAR model is based exclusively on stationary variables, cointegration tests are performed on non-stationary variables. It is therefore very important accurately to determine the order of integration of observed variables. For this purpose an ADF test is used. ADF test results indicate that both variables (*FDI and VOLUME*) are integrated of order one – $I(1)$. When variables were tested in levels, we could not reject the null hypotheses of non-stationarity. However, when they were tested in first differences, non-stationarity hypotheses could be rejected at all significance levels.

4.1 ESTIMATION OF THE LONG-TERM RELATIONSHIP BETWEEN STOCK MARKET AND FDI (COINTEGRATION APPROACH)

The first step in the analysis is testing for the existence of a long-term relationship between the stock market, represented by trade volume, and FDI stock. In this section we examine if FDI affects stock market movements. The long run relationship and causality are tested using both Engle-Granger and Johansen cointegration approaches.

Neither approach shows a long run relationship between observed variables. These results are not completely unexpected. As we stated in the literature review section, the main channel through which FDI can influence the stock market is economic growth. However, in case of Croatia, a number of authors have found no causal relationship between FDI and economic growth.

Following the Engle-Granger cointegration procedure, we estimated the long run equation in the first step and tested the residuals for stationarity afterwards. The following equation was estimated:

$$\ln CRBX_t = \beta_0 + \beta_1 \ln FDI_t + \varepsilon_t \quad (4)$$

However, residuals proved to be non-stationary, which implies that there is no cointegration between variables. Results of the unit root test are shown in table 1 along with critical values from MacKinnon (1991).

TABLE 1
Results of Engle-Granger and Johansen cointegration tests

Engle-Granger cointegration test (ADF test of residuals)		
H_0 : no cointegration	ADF t-statistics	5 per cent critical value ¹
$\gamma = 0$	-0.58	-3.46
Johansen cointegration test results		
Model 1: Trend and intercept assumption: intercept in CE, no intercept in VAR		
H_0 : # of coint. vectors	λ_{trace} statistics (5 per cent critical value)	λ_{max} statistics (5 per cent critical value)
$r = 0$	17.44 (20.26)	11.70 (15.89)
Model 2: Trend and intercept assumption: intercept in CE and VAR		
H_0 : # of coint. vectors	λ_{trace} statistics (5 per cent critical value)	λ_{max} statistics (5 per cent critical value)
$r = 0$	13.19 (15.49)	11.46 (14.26)

¹Critical values are taken from MacKinnon (1991).

The Johansen cointegration test also suggests that there are no cointegrating vectors among observed variables, which means that there is no long run relationship between them. The Johansen cointegration test was used to examine the existence of cointegration for the two forms of cointegration: (1) a model with constant in cointegration equation (CE), but without a constant or a trend in VAR and (2) a model with constant in CE and VAR without trends. Since the observed variables behaved similarly, we decided to test only the models with and without constant. Models with trend are excluded from testing, since both variables have similar movements that do not indicate the existence of a linear trend. In neither model

can the maximum eigenvalue or trace statistics reject the null hypotheses for the number of cointegrating vectors equal to zero. Test results are shown in table 1.⁴

The impact of FDI on the stock market is not evident in the long run. Moreover, as theoretically argued earlier, one of the main channels through which a long-term impact of FDI inflows on the stock market takes place is the impact of FDI on economic growth. However, since there is no evidence of the existence of a long-term relationship between these variables in Croatia, the question of the validity of any long-term relationship between FDI and Croatian stock market arises. If there is no positive impact of FDI on economic growth, and, as we mentioned in the literature review, this relation has not yet been empirically proven for Croatia, then that could explain the absence of any positive effect of FDI on capital markets in the long run. However, as mentioned earlier, one should bear in mind that there are other possible explanations for the lack of a long-term relationship between the variables in question since economic growth is not the only channel through which FDI can impact the stock market in the long run.

4.2 ESTIMATION OF THE SHORT-TERM RELATIONSHIP BETWEEN STOCK MARKET AND FDI (VAR APPROACH)

The second part of the empirical analysis is based on estimation of the short-term relationship between the stock market and FDI in Croatia. In this part, we assume reverse causality, i.e. we assume that signals from the stock market influence investors' decisions and therefore FDI stock in the short run.

Based on the results of an ADF unit root test, vector of dependent variables Z_t is set in accordance with equation (2) shown in the methodological review. Both variables are expressed in logarithms and are differentiated prior to the analysis, and can therefore be taken as approximations of the growth rates. In accordance with Cholesky ordering, restrictions are set so that the variable $\Delta \ln FDI$ does not influence the variable $\Delta \ln VOLUME$ in the first period, but $\Delta \ln VOLUME$ can influence $\Delta \ln FDI$ even in the first period. Such restrictions are in accordance with our theoretical arguments. Also, a dummy variable *DUMMY* (equals 1 in 2007:Q1, 0 otherwise) has been added to the model based on AIC and SIC information criteria in order to correct for the non-normality of residual distribution. A period covered with the dummy variable could be closely related to the privatization process of the Croatian oil company INA, which occurred at the end of 2006. Privatization was carried out through the initial public offering of company stocks, which boosted the trade on ZSE.

The model includes three lags, which has been determined based on the minimization of the information criteria. The stability of the model has also been tested

⁴ We should point out several issues regarding optimal lag length of the estimated model. Namely, we based our analysis on Hannan-Quinn (HQ) information criterion. Both HQ and Schwarz information criterion (SIC) indicated one lag as optimal in a model. However, Akaike information criterion (AIC) points to either eight or four lags as optimal in a model. Choosing different number of lags changes results significantly.

and the test has shown that there are no roots of the characteristic polynomial outside the unit circle; hence the model satisfies the stability condition. The diagnostic verification of the model leads to the conclusion that it satisfies all assumptions about the distribution of error terms. The tests for autocorrelation, heteroskedasticity and normality of residuals for the VAR model are presented in table 2.

TABLE 2
Diagnostic testing for violations of the assumptions of residuals distribution (p-values in parentheses)

Portmanteau test for autocorrelation	LM test for autocorrelation	Residual normality test	White heteroskedasticity test (with cross terms)
VAR model			
Lag 1 (NA*)	Lag 1 (0.52)	Skewness (0.51)	Joint test (0.26)
Lag 4 (0.08)	Lag 4 (0.61)	Kurtosis (0.56)	
Lag 8 (0.06)	Lag 8 (0.20)	Jarque-Bera (0.64)	
Lag 12 (0.25)	Lag 12 (0.84)		

*The test is valid only for lag lengths larger than the VAR lag order.

Table 3 presents the variance decomposition, and results point to two conclusions. First, the variance of $\Delta \ln VOLUME$ is completely explained by its own movements (more than 90 per cent of variation). A stable structure of the variance is achieved after only three quarters, which does not change significantly even after two years (eight quarters). Such results should not be surprising. Stock trade is characterized by high volatility and persistence (autocorrelation) which is associated with expectations of investors in the stock market. The fact that $\Delta \ln VOLUME$ explains almost 100 per cent of its own variation in the first three periods also supports these conclusions.

TABLE 3
Variance decomposition of trade volume and FDI (in %)

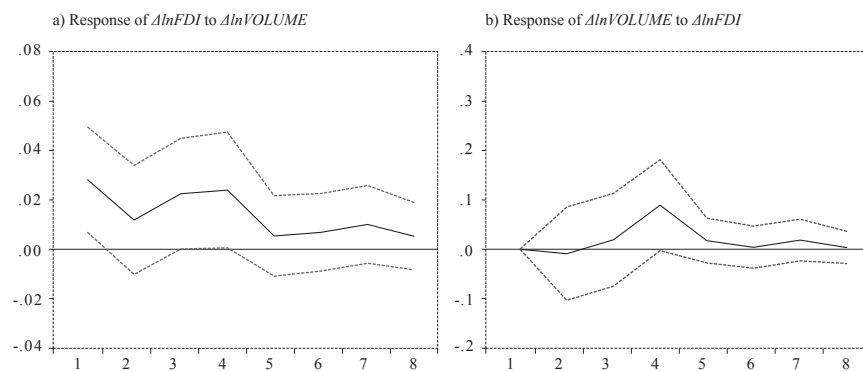
Variance decomposition of $\Delta \ln VOLUME$		
Variance period (quarters)	VOLUME	FDI
1	100.0	0.0
2	99.9	0.1
4	93.2	6.8
8	93.0	7.0
Variance decomposition of $\Delta \ln FDI$		
Variance period (quarters)	VOLUME	FDI
1	16.1	83.9
2	17.4	82.6
4	30.9	69.1
8	32.3	67.7

Second, unlike the previous scenario, FDI is fairly influenced by movements in the stock market. Particularly, $\Delta \ln VOLUME$ explains 32 per cent of $\Delta \ln FDI$ variation after two years. However, the stock market explains less than 25 per cent of variation in FDI in the first three quarters, but after that it becomes more important and explains around 30 and 33 per cent of variation in FDI. These results indicate that investors' decisions to invest abroad are not impulsive, because of an evident lag in variance decomposition. However, events on the stock market are an important indicator for foreign investors, since the stock market can explain around one third of the variation in FDI stock. In order to determine the nature of a reaction of FDI to shocks in the stock market, impulse response functions are analysed.

Impulse response functions confirm previous findings. From graph 2, panel (a), it is obvious that a unit shock in the stock market leads to a positive reaction in FDI in the first quarter. However, in addition to the positive reaction in the first quarter, there is a strong FDI reaction even after three and four quarters which confirms evidence from variance decomposition. Again, results confirm the contention that investors' decisions are not impulsive, but there is a lag between a shock occurrence and FDI reaction. After one year, reaction weakens and becomes insignificant. There is also a short-term impact of FDI on Croatian stock market (graph 2, panel (b)), which is statistically significant only in the fourth quarter after the occurrence of a shock. However, the response instantly fades and is not particularly strong.

GRAPH 2

Impulse response function – response to one standard deviation



Based on the results obtained, it is plausible that there is a short-term connection between the stock market and FDI in Croatia. Stock market trade volume explains a high proportion of FDI variance (32 per cent after two years) and FDI reacts strongly and persistently to a shock from the stock market. Based on these findings it can be concluded that the domestic stock market plays an important role in informing foreign investors, i.e. that it is an important indicator of market

vitality and the investment climate in Croatia. Through this channel, developments on the stock market are transferred to investment decisions in the short run.

5 CONCLUSION

Economic theory suggests bidirectional causality between foreign direct investment and stock market movements, but the direction of the relation varies in different time frames. In the short run, positive trends in stock markets can serve as an indicator of the vitality of the market, favourable investment climate and the country's openness to foreign investment. Therefore, movements in stock markets directly affect the amount of FDI in the short run. In the long run, however, the direction of causality is reversed. Namely, if FDI encourages rapid technological progress and economic growth through the transfer of know-how and technology, then it indirectly affects the growth of stock markets as well. Other explanations are based on the assumption that the presence of FDI inflows encourages policy makers to adopt market-friendly regulations and increases the confidence of investors. That further increases the number of investors and encourages the development and the volume of trade on domestic stock markets. However, the exact direction of the connection is unknown for most countries and must therefore be directly investigated.

This paper examines the case of Croatia. The basic hypothesis of the paper was that, in the short run, movement on the Croatian stock market, measured by trading volume, positively affects FDI stock in Croatia. In the long run however, the growth of FDI positively influences the stock market, i.e. trading volume. In order to investigate the long term relationship, both Engle-Granger and Johansen cointegration approaches were used, while the short term dynamics was analyzed using a two-variable VAR model. The results do not indicate a long term relationship between FDI and stock market in Croatia. However, they may not be surprising in this particular case, although they deviate from theoretically backed expectations. In fact, one of the premises for the existence of a long-term connection between FDI and the stock market is an existing significant influence of FDI on domestic economic growth. Given that previous research for Croatia and other transition countries (Mencinger, 2003; Šimurina, 2006; Bogdan, 2009) failed to confirm a significant relationship between FDI and economic growth, this could represent an obstacle to the mentioned channel of FDI impact on the Croatian stock market. However, as noted, economic growth is not the only determinant of FDI impact on the movement of the domestic stock market. Therefore, it is not easy to give a precise explanation for this finding, which remains an interesting topic for future research.

In the short run, however, stock market proved to be an important determinant of FDI. It explains about 30 per cent of variation in FDI during first eight quarters, although the initial impact is much less pronounced. Moreover, FDI significantly reacts to a shock in the stock market, but with a pronounced lag, i.e. the reaction

is positive in the first, third and fourth quarter after the shock occurs. The results obtained are thus consistent in the short run with theoretical assumptions and prove that stock market movements are an important short-term determinant of FDI in Croatia. The observed lag can be explained by the long term character of FDI decisions, which is also in compliance with theoretical assumptions.

The main contribution of this paper is an additional step towards the clarification of the so far rather unclear relationship between FDI and the stock market in Croatia, as well as of their characteristics and determinants both in long and short run. The research proceeds from accepted theoretical assumptions, and thus represents mainly a contribution in terms of empirical research. However, the confirmation of the existence of a short-term connection and the inability to prove long-term causality between the stock market and FDI in Croatia can also be useful to policy makers and financial investors in the decision making process.

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Effective Federalism and Local Finance

Volume I: How federal and decentralized systems work and institutional underpinnings, pp. 562

Volume II: Federal and decentralized policy, governance, issues and challenges, pp. 709

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Fiscal federalism and decentralization have been studied and researched by academics and scientists all over the world since the beginning of the twentieth century. Accordingly, the literature on various perspectives of fiscal federalism has grown rapidly over the years. Although the well-known Oates classification (*traditional vs. modern theory*) of fiscal federalism literature according to its vertical structure, or in terms of evolution, provides a good insight into the genesis of fiscal federalism thinking, it does not help much in differentiating among the various aspects of fiscal federalism abundantly researched in recent literature. The modern theory of fiscal federalism turned out to be so extensive that Oates' vertical systematization proved to be insufficient. Despite the fact that most recent reviews rely on Oates's division of the literature, the need for a complementary systematization emerged rapidly.

Classification and systematization of such a huge literature body in order to facilitate access to relevant information for people studying or working in the field of fiscal federalism has become a real challenge. To resolve this, experts from various subfields edited works with selected contributing authors clarifying certain topics and providing solid fundamentals for further research. Ahmad and Brosio's "Effective federalism and local finance" is certainly one of the greatest examples. In contrast to Oates's vertical structure of fiscal federalism literature, Ahmad and Brosio present a more horizontal structure based on major logically organized research areas.

The title was published in 2011 by Edward Elgar Publishing in the International Library of Critical Writings in Economics Series – a thematic selection of the most important articles in economics. Each title within this series is edited by leading specialists who provide an introduction and comment on the publications included. Given the topic of this issue, their professional competences and years of experience in researching fiscal federalism have certainly helped Ahmad and Brosio to successfully fulfill their editing role.

Ehtisham Ahmad is a Senior Fellow at University of Bonn, and a Visiting Senior Fellow at the London School of Economics Asia Research Centre in the United Kingdom. He has held senior positions in the International Monetary Fund, collaborated on projects for the World Bank, Asian Development Bank, UN and was a special adviser to the Finance Minister of Saudi Arabia. Ahmad has researched and written extensively in the fields of fiscal federalism and the political economy of intergovernmental fiscal relations. Giorgio Brosio is a professor of public finance and local government at the University of Turin. He has held professorial positions at several universities in Italy, Switzerland and France. Brosio was also a visiting fellow at the University of York, at the Brookings Institution, Brown University, the Australian National University and the International Monetary Fund. His main research interests include fiscal federalism, local government, public economics and finance, and public choice. Both Ahmad and Brosio are prolific scholars who have made a significant mark on the development of fiscal

federalism literature. The fact that they edited this issue at the zenith of their careers makes the editors' pick of articles included in "Effective federalism and local finance" more credible and reliable.

The title is divided into two volumes. Volume I, *How federal and decentralized systems work and institutional underpinnings*, has 562 and Volume II, *Federal and decentralized policy, governance, issues and challenges*, 709 pages (1271 pages in total). The two together encompass 50 seminal articles on fiscal federalism dating from 1961 to 2009. Articles are systematically grouped into 9 thematically separated parts – the first three of them (Theoretical advances, Mobility and strategic behavior and Institutions) being incorporated in Volume I and the rest (Decentralized policies and governance, Financing and accountability, Taxation of natural resources, Governance considerations, Macro-fiscal management and political economy of subnational debt and Environment and natural disasters) in Volume II.

In other words, the first volume deals mostly with foundations of fiscal federalism and other, more general, issues. It begins with the theoretical framework for fiscal federalism laid down in Oates (2008), Olson (1969) and Oates (1981) discussing fiscal federalism theory and institutions, as well as the division of responsibilities among different levels of government. The absence of Tiebout (1956) in this part was partially compensated for by Oates (1981) which refers to the work of Tiebout, but Tiebout's seminal paper presented in its original form would definitely have fitted into this part and made it more complete. Seabright (1996), Lockwood (2009) and Salmon (1987) conclude the first part discussing accountability issues and political economy aspects of fiscal decentralization as well as competition and spatial interactions between governments. The rest of Volume I (parts II and III) deals with local governments' strategic behavior, population movements within countries, redistributive policies and institutions. The list of main contributors to these parts includes Keen (1998), Wildasin (2003), Dixit and Londregan (1998), Salmon (2002) and Gurgur and Shah (2002).

Policy-related questions and experiences are extensively represented in the second volume. Accordingly, the first two parts of Volume II consist of papers covering various aspects of the decentralized provision of public services and local government financing. Although these fields have always been present in the fiscal federalism literature, hyperproduction in these areas resulted in a vast literature of questionable quality. Therefore, the editors' selection of the most relevant papers (e.g. Ahmad, Brosio and Tanzi, 2008; Ambrosanio and Bordignon, 2006; Oates, 1999 and Musgrave, 1961) serves as a unique source of highly relevant literature, which is certainly of great assistance in dealing with the overload in recent fiscal federalism literature. The last four parts of this volume are particularly valuable. As opposed to the first two parts, the rest of the volume flourishes with themes not so much represented in the literature. Those include taxation of natural resources (Brosio, 2003), governance considerations (Ahmad, Albino-War and Singh,

2006), macro-fiscal management and political economy of subnational debt (Qian and Roland, 1998; Rodden and Wibbels, 2002), as well as environmental issues and natural disasters (Oates, 2002; Goodspeed and Haughwout, 2007).

Published as a book chapter, Brosio (2003) examines arguments for sharing the natural resources revenue among different levels of government. Ahmad, Albino-War and Singh (2006) focus on fiscal management at the local government level and conclude that “even with adequate monitoring of subnational spending, there has to be an emphasis on the effects of such spending, particularly the incurring of debt and other contingent liabilities, on overall macroeconomic aggregates”. Qian and Roland (1998) provide interesting insights into the soft budget constraint problem, while Rodden and Wibbels (2002) test various hypotheses concerning the influence of different factors on a federation’s capacity to control deficits and inflation, claiming that “increased decentralization of expenditures in federations is associated with lower deficits and inflation”. Oates (2002) deals with (de)centralization of environmental responsibilities, making a solid base for Goodspeed and Haughwout (2007) to conclude Volume II devoting particular attention to natural disasters and optimal insurance system.

Overall, the selection of the most important topics, well organized in clearly separated thematic sections, yet vividly connected and intertwined in the Introduction, makes the “Effective Federalism and Local Finance” a highly valuable piece in fiscal federalism literature. By creating the list of publications to be included in this title, Ahmad and Brosio did not favor the classical masterpieces but rather prioritised more recent articles systematically discussing current issues and concerns in fiscal federalism. Missing Tiebout (1956) in the first part of Volume I or Kornai’s articles on the soft budget constraint in the fifth part of Volume II additionally supports this argument. Although the shortlisted articles discuss both traditional and contemporary aspects of intergovernmental fiscal relations from the current perspective, they mostly rely on the classical literature of fiscal federalism. This makes Ahmad and Brosio’s book a remarkable reference source for students, researchers and lecturers. Fiscal federalism literature was in want of a book that systematically integrates the most important advances in this area and “Effective Federalism and Local Finance” has certainly met the need.

This opulent repository of fiscal federalism literature gathers in one place the most important publications evolving continuously in this field for almost half a century. All the publications are presented in their original form with their original numeration to facilitate referencing. However, the title is complemented with its own numeration which considerably simplifies moving through different publications. Reprinting all the articles in their original form significantly enriched the edition interfacing present and past analytical tools and writing styles. The pick of articles and diversification of topics make the title required reading for both beginners and professionals dealing with fiscal federalism issues. Students could use the book as an inexhaustible source of information on different aspects of fiscal

federalism, while more advanced users could benefit from refreshing their knowledge with both traditional and modern concepts emerging through the development of fiscal federalism theory. “Effective Federalism and Local Finance” is definitely an essential guide for anyone studying, researching or in any other way dealing with intergovernmental fiscal relations. It might also prove useful for practitioners and policymakers, enabling them to understand the consequences of fiscal interaction among different layers of government.

This is certainly not a book to read and set aside; rather, it is a fundamental piece of fiscal federalism literature to which the reader will often resort.

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