

# Financial 2/2014 Theory & Practice

GORAN VUKŠIĆ

Employment and employment conditions  
in the current economic crisis in Croatia

MARINA KUNOVAC

Employment protection legislation in Croatia

ANA GRDOVIĆ GNIP

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The history of double tax conventions in Croatia

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# Financial 2/2014 Theory & Practice

## TABLE OF CONTENTS

### Articles

- 103 GORAN VUKŠIĆ  
Employment and employment conditions in the current  
economic crisis in Croatia
- 139 MARINA KUNOVAC  
Employment protection legislation in Croatia
- 173 ANA GRDOVIĆ GNIP  
The power of fiscal multipliers in Croatia
- 221 HRVOJE ARBUTINA and NATAŠA ŽUNIĆ KOVAČEVIĆ  
The history of double tax conventions in Croatia
- Book review**
- 247 RICHARD BALDWIN and CHARLES WYPLOSZ  
The Economics of European Integration (*Tomislav Globan*)



# Employment and employment conditions in the current economic crisis in Croatia

GORAN VUKŠIĆ, PhD\*

Article\*\*

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## Abstract

*The goal of this research is to analyze developments in employment and employment characteristics during the current crisis in Croatia. The main findings can be summarized as follows: (1) The primary (aggregate) mode of adjustment to the crisis was a decline in employment. There are, however, considerable differences in adjustment patterns across economic activities. (2) During the crisis, jobs were lost in the, more dynamic, private sector, while the number of jobs in the public sector (entities in state ownership) slightly increased. (3) Economic activities with comparatively larger shares of women in employment have experienced fewer employment cuts and the aggregate employment share of women rose during the crisis, especially in activities with a larger share of public sector workers. (4) There has been a declining share of younger workers during the crisis, justifying policy actions to facilitate their employment. (5) Employees with comparatively lower educational attainment face severe challenges in the labor market, which is a longer term trend, not specific to the crisis period. There are indications that this group of employees enjoys a higher level of protection in the public sector. (6) Analysis also shows a rising significance of more flexible forms of employment: increasing shares of fixed term employees (during the last two observed years), and of part time workers. (7) Working hours do not exhibit any strong trends specific to the crisis, except for the diminishing number of overtime hours per worker.*

*Keywords: employment, wages, employment conditions, crisis, Croatia*

## 1 INTRODUCTION

The current economic crisis has put pressure on many private companies, but also state owned enterprises and other public sector entities to cut costs. Many of them reduced their labor force and/or the wages of their employees. In addition to these negative effects, there may have been changes in other employment characteristics, such as full time and part time employment, employment for an unspecified vs. a fixed period of time, number of hours worked, etc. These effects may have differed across different groups of employees as distinguished by gender, age or educational attainment. Also, there may be differences depending on the type of ownership (private vs. state ownership).

The goal of this research is to analyze developments in employment and employment characteristics described above, using sectoral data for Croatia between 2009 and 2012. The methods applied are descriptive statistical analysis and regression analysis. The paper is structured as follows: the second section gives a short and selective review of related literature. The third section presents a brief overview of the main characteristics of the Croatian labor market and aggregate and sectoral trends and developments of employment, real gross wages and employment characteristics for the period between 2000 and 2012. The fourth part of the study looks deeper into sectoral data for the years of crisis between 2009 and

2012, by performing regression analysis in order to gain more insight into the factors affecting the trends in employment and employment characteristics. The last section discusses the results, gives a summary of conclusions and some policy implications.

## 2 RELATED RESEARCH

The impact of economic crises on labor market developments in general, and of the current crisis specifically, has been the subject of numerous research papers. This section reviews some of the existing empirical work for the current crisis, but it also supplements the insights by taking into account the available lessons from previous crises episodes. It should be noted that many of the studies of the impact of the current crisis on labor market developments are restricted by the fact that the most recent data come with a time lag, so that the available information may be suited only for an analysis using descriptive statistics and not for more sophisticated econometric analysis. The most common concerns of the existing related research are the (un-)employment of women and young workers and the adjustment patterns of the labor market to economic shocks, i.e. the question whether employment decline dominates over real wages decline, or whether the quality of jobs is deteriorating, some types of employment becoming more dominant during the crisis.

Khanna, Newhouse and Paci (2010) present early evidence on the labor market impact of the current crisis for 41 middle-income countries. They state that the number of jobs did not change much – employment growth did slow down, but only moderately, with positive growth rates being recorded in the crisis for the majority of observed countries. Still, the reduction in employment growth in Eastern European countries turned out to be more severe. The authors also highlight the differences according to exchange rate regimes, those countries with a fixed exchange rate experiencing stronger employment declines.<sup>1</sup> However, reduction in real earnings growth has been much sharper and accounted for almost three quarters of the wage bill growth decline on average, but with stark differences across countries. The major factor behind the reduction in earnings was found to be a decline in the number of hours worked, but the shift in employment away from the better-paid jobs in the industrial sector also played an important role.

Another important study covering the labor market effects of the current crisis for a number of countries is the article by Cho and Newhouse (2013). They examine the impact of the crisis on different types of workers in 17 middle-income countries and find that young workers experienced the most striking shift from wage employment to unemployment. Many of them also exited the labor force, as self-employment did not turn out to be a strong buffer against shocks. They were either laid-off disproportionately much or failed to be hired after exiting schools. As for

<sup>1</sup> The exchange rate regime is also found to be highly relevant for the labor market effects of the crisis, for a number of countries experiencing severe financial crises in the 1990s (Fallon and Lucas, 2002).

the differing impact on workers by gender, men are found to be hit more severely by this crisis than women, unlike in most of the past crises. The authors explain this by men's higher initial employment rates, and the concentration of men workers in industries that experienced more severe deterioration of economic conditions. Furthermore, they emphasize the possibility that firms substituted away from men workers because of the gender wage gap, i.e. because they tend to be more expensive. As for the differences in the effects of the crisis across employees with different educational backgrounds, the study finds surprisingly small differences, again, unlike in most of the past crises. Still, employees at the extreme ends of the education distributions tended to suffer smaller declines, i.e. workers with medium education level suffered relatively more in the crisis.<sup>2</sup> Cho and Newhouse (2013) further report mixed evidence on the impact of crisis on urban and rural workers, with the former experiencing larger employment cuts, but also stronger increases in working hours and earnings.

As mentioned above, many related studies deal with the impact of crisis on women's employment. Sabarwal, Sinha and Buvinic (2011) review the evidence from the existing research and discuss it in the context of the current crisis (for which there were no available analyzes at the time their study was written). Besides the possibility that female workers are more exposed to sectors hit harder in the current crisis (especially in lower-income countries), the authors believe that the direct adverse effects of the economic decline may be more pronounced for women than they have been historically, because of women's increased participation in the globalized labor force generally. The second-round effects should depend on strategies adopted to cope with the negative shocks which are expected to differ across countries and households, depending on age and education. According to evidence from past crises, labor force participation of women is more likely to increase for low-income households and in low-income countries, for less educated and older women. This is in line with some results from Signorelli, Choudhry and Marelli (2012) who analyze the impact of past financial crises (between 1980 and 2005) for a large number of countries and try to assess the likely impact of the present crisis on female employment indirectly (given the time lag in data and lack of more explicit studies), by considering some aspects of this crisis and the results for the past episodes. They find that the impact of past crises on the participation rate of women is negative and significant only for high-income and upper middle-income countries. However, for some developed countries men workers were hit more severely by the current crisis as they dominate in the employment of the sectors experiencing stronger economic downturns.<sup>3</sup> The results from Cho and Newhouse (2013) given above also show that the hypothesized, and

<sup>2</sup> Leung, Stampini and Vencatachellum (2009) analyze whether human capital helps to protect workers from adverse shocks in a country study for South Africa in the present crisis. They find that education and experience are largely able to offset the negative impact of the crisis on the likelihood of employment.

<sup>3</sup> Barakat et al. (2010) come up with the same conclusion by observing the unemployment rates for men and women in EU-27.

expected, stronger negative impact on female workers did not materialize for middle income countries either.

As for the impact of the current crisis on young workers, Ha et al. (2010), present data showing a disproportionate adverse impact on young workers for large number of countries (mostly developed, but also for some emerging economies). They argue that such development meant a further relative deterioration of the labor market position of young people, as their unemployment rates were much higher than for other age groups of workers even before the crisis. The authors find the position of young, low-educated workers to be especially challenging. Furthermore, there are already indications of increasing long-term youth unemployment in the majority of the observed countries. The authors also emphasize the observed pattern of decreasing youth participation rates, i.e. the trend for discouraged young people to leave the labor market altogether, as well as the trend for the increasing incidence of temporary and especially of part time jobs among young workers, visible since the beginning of the crisis in many of the observed countries. Barakat et al. (2010) also document more pronounced negative effects of the crisis on young workers for European economies, when compared to older workers (age 55 to 64). They see potential reasons in the differences in employment contracts, as older employees largely hold indefinite contracts and enjoy better protection. They also stress that with rigid labor markets, it is mainly the inflows to the labor market that are affected, i.e. the younger workforce is affected disproportionately. Further analysis and support for the outlined conclusions are found in Scarpetta, Sonnet and Manfredi (2010), Bell and Blanchflower (2010, 2011) and Verick (2009). Bell and Blanchflower (2010, 2011) especially emphasize the potential longer-term consequences of youth unemployment while Verick (2009) stresses that young men were hit especially hard.

The only study known to the author of this research that analyzed the impact of current crisis on the Croatian labor market is that by Matković, Arandarenko and Šošić (2010). By observing data in the first year of the crisis, i.e. in 2009, and comparing these with pre-crisis period, the authors conclude that there has been a significant fall in employment in the crisis, but of smaller magnitude than the fall in GDP; employment cuts were the primary adjustment channel to deteriorating economic conditions, but later in 2009, real wages also started to decline; average working hours declined only marginally; crafts and small entrepreneurs were hit somewhat harder by the crisis, while public sector workers were protected; men were hit harder by employment declines, mostly due to their dominance in sectors which experienced more severe economic downturn, and some of them withdrew from the labor market; young workers face even larger challenges than before the crisis; and there has been an increase in the share of persons who had a working contract for an unspecified period of time, but lost their job.

### 3 TRENDS AND DEVELOPMENTS 2000-2012

This section presents the main features of the Croatian labor market, as well as the developments of the relevant indicators for the period between 2000 and 2012. There is a problem with data at sectoral level, since the classification of economic activities has changed from NCEA2002 to NCEA2007 during the observed period. The consequence is that sectoral data for most of indicators are not comparable across the whole period from 2000 to 2012. For this reason, the data are presented on an aggregate level, except for data on real gross wages and employment in legal persons, which were recalculated (reclassified) backwards to 2000 by the Croatian Bureau of Statistics (CBS), according to the new classification standard NCEA2007. This has important consequences for the regression analysis in the fourth section as well, because it limits the time dimension of the available data. The pre-crisis period is defined from 2000 to 2008, while the period after 2008 is considered crisis. This corresponds to real GDP growth rates which were positive between 2000 and 2008 and negative afterwards (i.e. it equaled zero in 2011).<sup>4</sup>

#### 3.1 MAIN CHARACTERISTICS OF THE CROATIAN LABOR MARKET

As shown in table 1, over the whole observed period, the Croatian economy has been characterized by comparatively low employment and high unemployment rates. The employment rate first declined in 2001 and again in 2003 and 2005. It rose in other pre-crisis years until 2008 when it reached the peak, and started falling again in the subsequent years. Unemployment was declining continuously before 2008, since when it has been steadily increasing. It is worth noting that the long-term unemployed represent a large share of total unemployment and that employment rates are low for both men and women. Furthermore, the low employment rates, even during the years of economic growth, reveal deep structural problems in the Croatian labor market (World Bank, 2011).

**TABLE 1**

*Employment and unemployment rates, in %*

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Employment rate	42.6	41.8	43.3	43.1	43.5	43.3	43.6	44.2	44.5	43.3	41.1	39.5	38.1
Unemployment rate	16.1	15.8	14.8	14.3	13.8	12.7	11.2	9.6	8.4	9.1	11.8	13.5	15.8

*Definitions of employment and unemployment rate according to International Labor Organization (ILO): population older than 15 years of age.*

*Source: Croatian National Bank Bulletin (Economic Indicators).*

Regulation of Croatian labor market is seen by many as being overly restrictive and resulting in too strong employment protection. Laying-off workers is found to be complicated and expensive, while flexible forms of employment are limited.

<sup>4</sup>Information on real GDP growth stem from the Croatian National Bank's Bulletin (Economic Indicators).

Some researchers saw this as the primary cause of low labor market dynamics, as described by job flows (jobs turnover), i.e. comparatively low job destruction and job creation rates, thus, leading to high unemployment and low employment rates (Rutkowski, 2003a; 2003b).<sup>5</sup> The comparison of the employment protection legislation (EPL) index for Croatia with other European countries was supportive for the assessment of Croatian labor market as comparatively inflexible, especially before the Labor Act was amended in July 2003 (Matković and Biondić, 2003). This was particularly the case for the components of EPL index describing temporary employment and collective dismissals, but also for employment for an unspecified period of time, i.e. regular employment (Rutkowski, 2003b). Even after this reform, the EPL index for Croatia remained above the EU average in all its components (the higher the index value, the stronger the employment protection), as well as above the average for eight Central and Eastern European countries, except for the component of collective dismissals (Šošić, 2004).

Thus, the main features of the proposed reforms in 2003 consisted of introducing more flexibility, although the sharpness of the initially suggested reforms was mitigated in the negotiation process. As outlined by Matković and Biondić (2003), more flexibility was primarily brought about by introducing and regulating the activities of Temporary Work Agencies (which act as an intermediary in temporary employment). Critics of the 2003 Labor Act reform suggested that, although the legislation may have been quite restrictive, it was not the cause of comparatively static labor markets because legislation has been poorly enforced. Šošić (2004) analyzed this issue and concluded that there have been important differences across sectors of ownership with regard to employment dynamics, i.e. that job flow rates in the private sector (especially in new companies) have been high, but that stringent regulation slowed down the process of restructuring in the government sector (and in privatized companies). He thus expected more flexibility to contribute to the speed of restructuring in these last two segments of economy. However, according to calculations presented in Šošić (2008), in the three years after the reforms, these expectations did not materialize, as demonstrated by job flow rates by firm ownership.

Further reforms in labor regulation were contained in the new Labor Act from 2009, which entered into force in the beginning of 2010. Changes were mostly related to the adjustment of the existing legislation to that of European Union (see Pavičić, 2010). The new Labor Act was amended in 2011 (see Pavičić, 2011) and in 2013 (see Vidović, 2013). However, even after the introduction of new legislation and the aforementioned amendments, the same or similar aspects of labor

<sup>5</sup> Rutkowski (2003a) analyzed other potential explanations for unsatisfactory labor market outcomes, such as unemployment benefit system, labor taxation, the wage structure, and skill and spatial mismatches, but found that they did not significantly contribute to the poor labor market performance of the Croatian economy. In the more recent World Bank reports, however, the skills gap, design of the social security system, labor market institutions (role of the trade unions, pro-labor biased labor courts, collective agreements, especially in the public sector, etc.) are stressed as additional causes of poor labor market performance, next to high employment protection (World Bank, 2009; 2010; 2011).

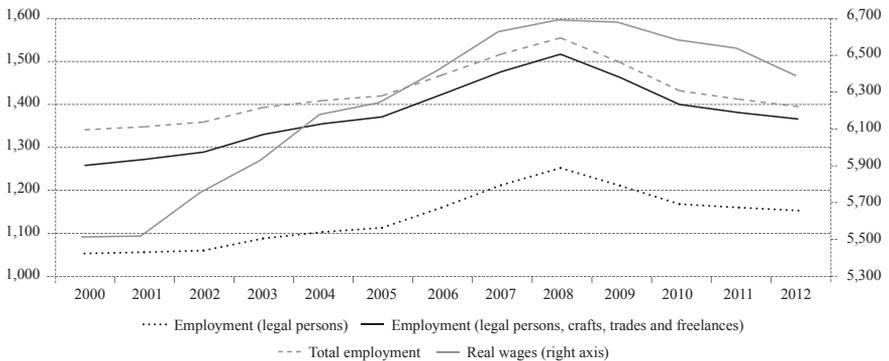
market legislation remain an important point of criticism in policy discussions and assessments. Clauwaert and Schömann (2013) review the set of labor market-related reform recommendations to the Croatian government made by the World Bank and the IMF during the crisis, showing that the primary concern is still the suggested inflexibility of the Croatian labor market. For example, conclusions by the World Bank (2011), stress that it is very difficult for employers in Croatia to adjust their labor inputs by adjusting employment or by adjusting the rigidly regulated working hours.

### 3.2 EMPLOYMENT AND WAGES: AGGREGATE TRENDS

Figure 1 shows aggregate developments in employment and real gross wages (in 2005 prices). There are three employment indicators: (1) employment in legal persons, the largest single segment of total employment; (2) employment in legal persons (first indicator) plus employment in crafts and trades and freelance occupations; and (3) total employment – employment in legal persons and crafts, trades and freelance occupations (second indicator) plus insured private farmers.<sup>6</sup>

**FIGURE 1**

*Real (gross) wages in legal persons (right axis, in HRK) and employment (left axis, in thousands)*



Source: Croatian Bureau of Statistics (CBS), real wages in 2005 prices.

All three measures of employment reached their peaks in 2008. In the period between 2000 and 2008 employment in legal persons increased by 18.9%, that was followed by decline of 7.9% during the crisis period. Employment in crafts, trades and free lances rose by 29.3% in the pre-crisis period, but the decline during the crisis was also more pronounced and it amounted to 19.6%. Unlike these two groups of employees, the number of insured private farmers has been decreasing over the whole period under observation: by 52.4% before the crisis and by an additional 23.7% by the end of 2012. The average real gross wage in legal persons was steadily rising until reaching its peak in 2008, with cumulative increase over

<sup>6</sup> See appendix for methodology and definitions.

the pre-crisis period amounting to 21.5%. The crisis brought a decline in amount of 4.6%.<sup>7</sup>

If one considers employment only in legal persons and compares it to the real wage developments, both of these variables in 2012 (1,153 thousand employees with an average real gross wage of HRK 6,395) were slightly below their respective levels in 2006 (1,160 thousand employees with an average wage in amount of HRK 6,428). Although relative employment decline in legal persons was stronger than real wage decline (as described by negative growth rates), employment increases between 2006 and 2008 were also higher than for the wages. However, the adjustment in crisis for this, the largest segment of employees, was more pronounced on the employment reduction side in the first two years of the crisis (as in other Eastern European countries, according to Cho and Newhouse, 2013), while real wages declined faster than employment in 2012 (in 2011 the intensity of adjustment was roughly the same).

### 3.3 SECTORAL DEVELOPMENTS OF REAL GROSS WAGES AND EMPLOYMENT IN LEGAL PERSONS

This part presents the data on sectoral developments of real gross wages and employment in legal persons for the period between 2000 and 2012. Table 2 shows growth in employment and real gross wages (1) from 2000 to 2008; (2) from 2008 to 2012; and (3) for the whole period from 2000 and 2012, for 19 sections of economic activity.

In the pre-crisis period, the majority of economic activities saw an increase in employment, with the highest growth amounting to 125.7% in section *L Real estate services*; 105.8% in section *N Administrative and support services*; and 75.6% in section *R Arts, entertainment and recreation*. However, there have been activities in which employment shrank during the good times before the crisis, with the strongest decline of 12.9% recorded in section *O Public administration and defense, compulsory social security*; 12.3% in section *A Agriculture, forestry and fishing*; and 7.4% in section *D Electricity, gas, steam and air conditioning supply*. Employment growth in the total economy in the pre-crisis period amounted to 18.9%. Real wages, on the other hand, grew in all economic activities before the crisis, except in section *N Administrative and support services*, where a slight decline of 3.9% was recorded. Interestingly, this is the section with the second largest employment growth. The largest increases in real wages can be observed in section *B Mining and quarrying* (a rather small section with respect to number of employees), where it amounted to 55.3%; section *M Professional, scientific and technical activities* with the growth of 50.4%; and in section *F Construction* where

<sup>7</sup> Related research uses real wage developments (instead of nominal) to describe the adjustments in the crisis – an approach followed in this study as well. It should, however, be reminded that prices in Croatia are largely determined by external shocks (see Krznar and Kunovac, 2010) so that declines in real wages (if caused by higher inflation rate) need not result in overall lower costs for producers, relative to their prices, if price increases mostly stem from the cost increases of the imported inputs.

the change over the pre-crisis period amounted to 38.5%. The growth of real gross wages before the crisis for the whole economy approximately equaled 21.5%.

**TABLE 2**  
*Sectoral developments of employment and real gross wages in legal persons, in %*

	Employment			Real wages		
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Changes in periods</b>	<b>2008/00</b>	<b>2012/08</b>	<b>2012/00</b>	<b>2008/00</b>	<b>2012/08</b>	<b>2012/00</b>
<i>Sectors (sections):</i>						
A Agriculture, forestry and fishing	-12.3	-4.1	-15.9	20.7	-3.2	16.8
B Mining and quarrying	8.1	-36.8	-31.7	55.3	-10.4	39.2
C Manufacturing	-0.3	-16.7	-16.9	27.3	-4.9	21.0
D Electricity, gas, steam and air conditioning supply	-7.4	-1.9	-9.2	26.0	0.0	26.0
E Water supply; sewerage, waste management and remediation activities	31.3	3.8	36.2	21.2	-6.7	13.1
F Construction	65.4	-27.4	20.0	38.5	-10.1	24.4
G Wholesale and retail trade; repair of motor vehicles and motorcycles	45.7	-16.6	21.5	31.9	-5.7	24.5
H Transportation and storage	2.2	-8.6	-6.6	36.3	-4.9	29.6
I Accommodation and food service activities	21.7	-1.6	19.8	28.2	-4.3	22.7
J Information and communication	19.9	4.0	24.7	15.5	0.1	15.6
K Financial and insurance activities	25.6	1.4	27.3	15.3	-1.1	14.1
L Real estate activities	125.7	20.4	171.8	12.7	-5.6	6.4
M Professional, scientific and technical activities	54.9	-2.5	51.0	50.4	-11.2	33.6
N Administrative and support service activities	105.8	13.6	133.8	-3.9	-14.0	-17.3
O Public administration and defense; compulsory social security	-12.9	-0.2	-13.1	2.7	-4.7	-2.2
P Education	21.8	7.5	30.9	14.8	-3.5	10.8
Q Human health and social work activities	13.2	6.9	21.0	8.7	-6.8	1.3
R Arts, entertainment and recreation	75.6	6.3	86.6	22.2	-8.9	11.3
S Other service activities	46.1	1.2	47.8	20.2	-4.7	14.6
Total economy	18.9	-7.9	9.5	21.5	-4.6	16.0
<i>Descriptive statistics by sections:</i>						
Minimum	-12.9	-36.8	-31.7	-3.9	-14.0	-17.3
Maximum	125.7	20.4	171.8	55.3	0.1	39.2
Mean	33.2	-2.7	31.5	23.3	-5.8	16.1
Standard deviation	38.7	13.8	51.7	14.9	3.8	13.2

Source: Author's calculations based on data from CBS.

During the crisis, employment declined in 10 out of 19 sectors of economic activities, with the largest fall of 36.8% recorded in *B Mining and quarrying*; 27.4% in *F Construction*; and 16.7% in *C Manufacturing*. Interestingly, employment in three sections with the highest pre-crisis employment growth considerably increased also during the crisis. Employment in the overall economy (in legal persons)

decreased by 7.9% during the crisis. Real wages, on the other hand, declined in 17 out of 19 activities after 2008 and the fall for the whole economy equaled 4.6%. One can observe quite large heterogeneity in sectoral developments of employment and wages, given the fact that not all activities were equally exposed to a negative economic shock and/or had a quite different adjustment patterns. For example, the sectors with the largest two employment cuts in the crisis were also characterized by the comparatively large declines in real wages (sections *B Mining and quarrying* and *F Construction*). At the same time, section *N Administrative and support service activities* recorded the second largest increase in employment and the largest drop in wages during the crisis.

### 3.4 EMPLOYMENT CHARACTERISTICS

Table 3 gives developments of a number of employment characteristics for the period from 2000 to 2012. The presentation is restricted to legal persons, as these indicators are available only for this employment segment. The first part of table 3 shows the number of workers by ownership: state, private and mixed ownership and workers in cooperatives, although this is a negligible segment as regards the number of employees. These data are not shown in shares like most of other indicators, since it is particularly interesting to see whether, especially during the crisis, the actual number of workers has been decreasing or increasing in legal entities with specific type of ownership. It is clear that private sector contributed the most to strong employment increases prior to the crisis.<sup>8</sup> Although this may partly result from the privatization process, the number of jobs in privately owned entities increased by a much larger amount than the absolute value of net job losses in other legal persons. At the same time, the number of employees in entities with mixed ownership decreased substantially, while that in the public sector (entities in state ownership) rose slightly.<sup>9</sup> However, while this slight increase in the number of public sector workers continued throughout the crisis as well, a number of jobs in the private sector were lost (number of employees dropped from 689 thousand in 2008 to 645 in 2012) and the decline in the number of employees in entities with mixed ownership continued at a faster rate.

The share of female employment decreased slightly at the beginning of the observed period, but started increasing after 2004. During the crisis, the rise in share of female employment accelerated, reaching its peak in 2012 when it amounted to nearly 47%. Thus, it seems that men workers have been hit by the crisis more than women.

<sup>8</sup>When referring to the data analyzed in this text, private sector employment is defined as the employment in entities in private ownership, while public sector workers are those employed in entities in state ownership.

<sup>9</sup>Again, privatization of state owned enterprises should have a negative partial effect on number of public sector employees. However, it may increase the number of employees in entities with private and/or mixed ownership, depending on whether a company has been fully privatized. Furthermore, there may be cases in which the state as the co-owner (mixed ownership) decides to sell its (remaining) shares, which is a (further) privatization of firms in mixed ownership. This should, *per se*, then lead to an increase in private sector employment and to a decline in the number of employees in entities with mixed ownership.



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
<i>Hours worked<sup>1</sup>, hours by employee</i>													
Total number of hours per worker	2,116	2,104	2,091	2,087	2,096	2,080	2,079	2,081	2,089	2,075	2,073	2,064	–
Hours actually worked	1,719	1,720	1,708	1,718	1,727	1,712	1,701	1,688	1,696	1,687	1,694	1,689	–
Hours not actually worked – paid within the legal entity	277	271	274	273	269	262	264	275	269	275	270	269	–
Hours not actually worked – paid out of a legal entity	97	88	79	66	69	75	80	84	91	88	88	84	–
Non-paid hours	2	1	1	1	2	2	2	1	1	1	1	1	–
Overtime hours	21	24	28	29	29	29	32	33	32	24	20	21	–

<sup>1</sup> See appendix for definitions.

Source: CBS and author's calculations based on CBS data.

As for the groups of employees by age, the shares for the three groups have been roughly constant in the pre-crisis period, but after 2008, the share of young workers (younger than 25 years of age) decreased from 7.2% in 2008 to only 4.4% in 2012, which is the lowest value during the observed period. This development after 2008 went hand in hand with a slight increase in the share of workers between 25 and 59 years of age and a more pronounced rise in the share of employees aged 60 or older.

Looking at the data on employment shares by educational attainments, one observes a clear trend of steadily decreasing share for the group of workers with comparatively lower education throughout the whole period. Exactly the opposite developments can be seen for shares of workers with secondary school and those with higher educational attainment.

The next two indicators refer to the shares of workers by type of employment (employed for an unspecified period of time, fixed period of time or as trainees), and to employees by contractual working time (full, part or short time workers).

Obviously, employees for an unspecified period of time dominate over the whole period under observation, but their share is characterized by a slowly diminishing trend before the crisis, with the lowest values in 2007 and 2008, followed by a small increase over the next two years and a slight decline in 2011 and 2012. Since the share of trainees has been rather constant (and small), data on workers employed for a fixed period of time give a mirror picture of those employed for an unspecified period, i.e. their share reached its peak of more than 13% in 2007.

The share of full time employees was rather constant in the pre-crisis period and exceeded the value of 98% in each of these years. In the crisis, however, this share declined slightly, but steadily, from 98.2% in 2008 to 97.1% in 2012. While the share of short time workers remained largely unchanged after 2002 (and rather small), the share of part time employees rose from 1.2% in 2000 to 2.7% at the end of the observed period. Thus, although the share is still very small, it has more than doubled, mostly in the years of the crisis.

The last part of table 3 shows data on hours worked. These are available only for the period until 2011 and they do not display any strong upward or downward trends, not overall, nor in the periods before and during the crisis. There is a slight decline in total number of hours and the hours actually worked in the crisis, but these numbers were declining also in part of the period before the crisis, i.e. this is not something specific for the crisis period. The only exception in this respect may be the number of overtime hours per worker which reached the highest values in the period between 2006 and 2008, after which there was a significant decline.

## 4 DEVELOPMENTS IN THE CRISIS

### 4.1 INTRODUCTORY REMARKS

This section looks into developments between 2009 and 2012 in more detail at the level of divisions of economic activity. Regression analysis is applied in order to check how various indicators changed in the crisis depending on sectoral employment growth and whether these changes have differed across different groups of employees. First, some data issues should be resolved. The analysis is performed at the level of divisions and all variables refer to employees in legal persons. However, there are a few very small divisions with extreme values on employment growth for some years, which can negatively affect the reliability of regression analysis, especially if these extreme values are the results of mismeasurement or errors in the data. For this reason, seven such areas of economic activities were excluded from the following analysis and the two have been combined in a single one (see appendix for details). Thus, the number of analyzed economic activities was reduced to 74 divisions (from the original 82). As previously noted, consistent disaggregated data for most of variables are available only from 2009. This makes a comparison with the pre-crisis data and trends impossible, restricting the set of available methodological approaches. Another issue is that disaggregated data on gross value added (GVA) is available only for the period until 2010 and for 42 sectors.<sup>10</sup> This precludes performing a reliable analysis of direct influence of (largely) deteriorated economic conditions at sectoral level on employment and employment characteristics. However, data on employment growth (*emp*) and real gross value added growth (*gva*), for 40 sectors of economic activity, from 2000 to 2010, are used to establish a statistically significant relationship between GVA and employment over a longer period, which can be described by the following equation:

$$emp_{i,t} = -1.702 + 0.016emp_{i,t-1} + 0.475gva_{i,t} + 0.196gva_{i,t-1} \quad (1)$$

(0.507) (0.126) (0.085) (0.099)

Sectors are denoted by subscripts *i*, while *t* stands for years. Robust standard errors of the estimated coefficients are in brackets. The coefficients for GVA are significant at 1% level, i.e. 5% level for the lagged GVA variable. Constant is significant at 1%, while the coefficient for lagged employment growth turns insignificant.<sup>11</sup> Given these results, it can be stated that employment growth is significantly determined by contemporaneous and last year's GVA growth. In the analysis that follows, which uses employment growth as explanatory variable, one can, thus, broadly interpret the results on the coefficients of employment growth also as the result of changed economic circumstances.

<sup>10</sup> Two of these were excluded from the analysis due to some extreme values of annual employment growth.

<sup>11</sup> Equation (1) was estimated using the dynamic panel data estimator from Arellano and Bond (1991). Different panel data unit root tests rejected the hypothesis of the unit root in the panels. GVA growth was treated endogenously, but the results hold if this approach is altered, as well as for the estimation excluding the constant term. Sargan test of overidentifying restrictions fails to reject the null hypothesis, that these restrictions are valid, while the Arellano-Bond test for zero autocorrelation in the first-differenced errors rejects the first-order autocorrelation and fails to reject the second-order autocorrelation.

Before moving to regression analysis, some descriptive statistics are discussed. Table 4 presents statistics of annual employment and real gross wages growth during the crisis on the sample of 74 divisions of economic activities. Even after excluding the activities with largest extremes in annual data, absolute values of minimum and maximum observations for the remaining sectors are still relatively high for some years, both for employment and wage growth.

**TABLE 4**  
*Employment and wages growth in crisis, in %*

	Employment growth				Real gross wages growth			
	2009	2010	2011	2012	2009	2010	2011	2012
<i>By divisions:</i>								
Mean	-2.2	-1.4	-0.4	-0.4	-1.0	-2.0	-1.2	-2.5
St. deviation	9.2	9.5	4.6	6.0	3.6	5.5	3.4	2.3
No. of obs. < 0	41	48	38	36	52	54	53	68
No. of obs. ≥ 0	33	26	36	38	22	20	21	6
Minimum	-39.5	-20.6	-10.0	-24.4	-7.0	-25.7	-15.9	-8.8
Maximum	16.5	27.4	13.1	15.9	13.6	24.0	5.6	3.1
74 divisions	-3.4	-3.5	-0.7	-0.5	-0.2	-1.5	-0.6	-2.0

*Source: CBS.*

It is interesting to note that negative employment growth in the first two years of the crisis was recorded in most economic activities, while in the last two years the number of activities experiencing negative and positive employment growth was roughly equal. Negative wage growth, on the other hand, prevailed in most sectors throughout the whole crisis and in 2012 only six activities saw a rise in real wages. The mean negative values for employment growth were smaller in absolute value than those for wage growth, in all years but 2009. Thus, for the majority of sectors, the crisis resulted in more intense adjustment on the side of wages than on the employment side. This is brought about by developments in smaller sectors since, as the comparison of means with the numbers for the aggregated 74 divisions suggests, declines in employment were more pronounced for all 74 sectors for all crisis years. In other words, relative employment declines were stronger in larger sectors. As for the declines in real wages, the situation is reversed and comparatively smaller sectors experienced stronger wage drop.

The next table shows the simple correlation coefficients between sectoral employment growth and other variables of interest, which will be used as independent variables in regressions that follow. There are comparatively high correlations between sectoral employment growth and the shares of part time employees, employees with higher education, employment of women and older workers. On the other hand, correlation of employment growth and workers with lower education turns negative and comparatively strong. There is a positive correlation between wage and employment growth.

TABLE 5

Simple correlation coefficients with sectoral employment growth

Growth of real gross wages	0.10	<i>Employment share by educational attainment</i>	
Employment share of women	0.22	Higher	0.22
Share of fixed term employees	0.09	Secondary	0.02
Share of part time employees	0.29	Lower	-0.25
<i>Employment share by ownership type</i>		<i>Employment share by age</i>	
Private	-0.05	Age < 25	-0.09
State	0.09	Age 25-59	-0.03
Mixed	-0.08	Age ≥ 60	0.16

## 4.2 REGRESSION ANALYSIS

Regression analysis is performed for a number of employment indicators, in order to check how the employment of different groups of workers and employment characteristics change in the crisis. The emphasis is on the impact of (i.e. partial correlation between) employment growth on wages, on the change in the employment share of a specific group of workers, and on the change of characteristics of employment. In the regressions, the possibility that this impact can depend on the ownership, i.e. that e.g. the state as owner may behave in a different way than a private owner, is specifically controlled for. Potential differences in response to crisis can be caused e.g. by softer budget constraints, or by higher union density and/or different collective agreements in the public sector (see Bagić, 2010:140). Furthermore, in regressions dealing with certain employment characteristics, other potentially important factors are also controlled for. The exposition in this section mostly focuses on the explanation of methodological details and presentation of results.

### 4.2.1 Real wages during the crisis

First, determinants of sectoral wage dynamics in the years of crisis (2009-2012) are analyzed, using similar econometric model specification as in Vukšić (2012). However, since data on GVA are not available, it was not possible to include the productivity variable (GVA per worker). Omitting a significant variable can cause biased estimates of coefficients of other explanatory variables, unless individual sectoral effects are allowed for in a panel analysis. Hence, the model tried to explain the determinants of real wage growth across sectors and time using the following explanatory variables: growth rate of macroeconomic real wage (denoted with *macroeconomic wage growth*, given the intersectoral dependence in wage dynamics; see Vukšić, 2012); sectoral employment growth (*employment growth*); change in share of women in employment in total sectoral employment ( $\Delta$  *women*, given the likely gender wage gap); change in share of employees with college and university education in total sectoral employment (denoted with  $\Delta$  *higher education*, since there is a likely educational premium); and the shares (and their changes) of employment by ownership (*private and state* –  $\Delta$  always denotes the

change in a variable, given the possible different behavior of state and private employers and a potential wage gap between wages in private and public sector).

**TABLE 6**  
*Determinants of sectoral wage dynamics*

Dependent variable	FE estimations			IV estimations		
	M1	M2	M3	M4	M5	M6
<b>Growth of real gross wages</b>						
Macroeconomic wage growth	0.790*** (0.225)	0.856*** (0.226)	0.791*** (0.230)	0.743*** (0.257)	0.863*** (0.285)	0.766*** (0.270)
Employment growth	0.173*** (0.046)	0.162*** (0.054)	0.176*** (0.052)	0.398*** (0.096)	0.501*** (0.142)	0.459*** (0.116)
Δ women	-0.651*** (0.200)	-0.674*** (0.226)	-0.652*** (0.203)	-0.587*** (0.222)	-0.373 (0.278)	-0.517** (0.230)
Δ higher education	1.093*** (0.166)	1.104*** (0.178)	1.094*** (0.161)	0.879*** (0.159)	0.855*** (0.178)	0.836*** (0.170)
Private	-0.127* (0.075)			-0.202*** (0.075)		
Δ private	0.034 (0.044)			0.062 (0.041)		
State		-0.012 (0.057)			-0.142* (0.082)	
Δ state		0.015 (0.045)			0.143** (0.069)	
Mixed			0.068 (0.054)			0.196*** (0.071)
Δ mixed			-0.022 (0.043)			-0.115** (0.051)
Constant	6.760 (4.788)	-0.994 (1.484)	-2.037*** (0.649)	11.787** (4.856)	2864 (2.307)	-2.941*** (0.765)
Obs.	222	222	222	222	222	222
R <sup>2</sup>	0.12	0.32	0.32	0.06	0.06	0.15

*Note: All variables are sector specific except for the growth of macroeconomic wage. Heteroskedasticity robust standard errors are in parenthesis.*

Given the possibility of significant individual sectoral effects and of the mentioned potential omitted variable bias, regressions assuming fixed and random individual effects were employed, but the Hausman test implied that the fixed effects model was more suitable. Thus, the results of regressions using a fixed-effect panel data estimator are given in the first three columns of table 6. Differences in the three models (M1-M3) refer to one-by-one inclusion of different kinds of employment by ownership variables, since they cannot be controlled for simultaneously given their relatively high mutual correlation. In the next step, all three models were estimated using the instrumental variable estimator with fixed effects, in which the employment growth variable was treated as endogenous and was instrumented by its own one year lag. Thus, these regressions, with results presented under M4-M6, account for the possibility that there is a simultaneous

relationship between wage and employment growth, which can lead to biased estimates in the first approach. A dynamic model (which includes a lagged dependent variable) was also estimated, using the Arellano-Bond estimator dynamic panel data estimator. The results of this approach largely coincide with results of the fixed effects estimations. However, when attempting to run regressions with the Arellano-Bond estimator, assuming endogeneity of the employment growth variable, no good instruments could be found and the regressions' diagnostics turned out bad, so that these results are not considered. It must, however, be emphasized that the lagged dependent variable never turned out significant, so that the estimates presented are the most confident given the data limitations.

The results show that growth rate of macroeconomic wage strongly affects sectoral wage growth, across all specifications and both methods. This is in line with the results from Vukšić (2012), who analyzed the wage dynamics for the period before the current crisis (from 1998 to 2007). Employment growth variable is also significant at 1% level, with positive coefficients, for all the approaches and with somewhat higher coefficients in instrumental variables estimations. Change in the share of women in total employment is highly significant, except for the specification M5, with a negative sign, implying that an increase in the share of women is associated with slower wage growth. This may indicate a gender wage gap. Similarly, an increase in the share of employees with higher educational attainments brings about higher wage growth rates, indicating an educational premium. As for the impact of ownership, negative coefficients for the share of private sector employees (not the change in share), imply that in the economic activities with a comparatively high share of private sector workers, wages tend to grow more slowly, or decline faster. This result is statistically significant at the 10%, i.e. 1% level. Similar results regarding the signs of coefficients, but with differences with respect to statistical significance, are obtained for the share of public sector workers. These are significant at the 10% level in the instrumental variable estimations only. Coefficients of changes in private and public sector employment shares are both positive, but insignificant, except for public sector employment, which is significant only in the estimations using instrumental variables. Finally, results for the respective variables on employment share in entities with mixed ownership have opposite signs and are significant only in the instrumental variables approach. One should note that in regressions including the employment share of private sector, the counterfactual is employment in both, state owned and entities in mixed ownership. The analog applies for other specifications.<sup>12</sup>

In addition to the model specifications presented in table 6, models were estimated that also included other employment indicators relating to shares of employees by age, by type of employment and by contractual working time (as well as the chan-

<sup>12</sup> It should be noted here that the results for variables describing the change in share of employees by ownership are confirmed also when the shares by ownership variables are excluded from regressions, or when they enter with one year lag.

ges in these variables). The results of these additional estimations are not shown, because none of the additionally included variables turned significant in any of the specifications.

#### 4.2.2 Employment by groups and other characteristics

As for the other employment indicators analyzed in the rest of this section, the empirical approach used was to test for the heteroskedasticity and serial correlation in the Ordinary Least Square (OLS) framework for each estimated model specification. Afterwards, Generalized Least Square (GLS) regressions were performed, producing heteroskedasticity robust standard errors and/or assuming an AR1 process in the error term, depending on the results from the tests. In cases in which neither heteroskedasticity nor serial correlation turned out to be a problem, standard OLS assumptions were used in the estimations.<sup>13</sup> Results are presented in tables 7-12, but before they are presented, it should be noted that for each dependent variable, model specifications include: sectoral *employment growth* variable, lagged dependent variable (capturing initial conditions), as well as ownership variables (*private* or *state*, denoting shares of employment in private or state owned entities, respectively) as explanatory variables.<sup>14</sup> Caution is required in interpreting the results of estimated coefficients of the sectoral employment growth: the impact of changing employment on dependent variable need not be linear, i.e. it need not have the same direction in times of increasing and decreasing employment. For this reason, if the estimated coefficients are not significant, one cannot make reliable conclusions about the direction of the impact of changing employment on dependent variables. Variables entering the equation with a one year lag are denoted with *lagged* in the parentheses, while  $\Delta$  always denotes the change in a variable.

The results from regressions investigating the impact of employment growth on the changes in the shares of employment by ownership are summarized in table 7 and show that the partial correlation between employment growth and change in shares of employment by ownership is positive and statistically significant for private sector, while it turns negative for the changes in share of employees in state owned enterprises and entities. This could imply more employment dynamics in the private sector, i.e. that in economic activities with positive employment growth, the share of private sector workers increases, and the other way around (other things held equal). The opposite holds for public sector employment. At the same time, coefficients of lagged values of shares in employment by ownership, denoted with *private (lagged)* and *state (lagged)*, turn negative and significant in both cases.

<sup>13</sup> Individual sectoral effects are not included because for both, random and fixed effect approaches, the appropriate tests (the F test for fixed effects and the Breusch-Pagan Lagrangian multiplier test for random effects) rejected the hypothesis of their significance.

<sup>14</sup> Given the already very large number of regression results presented below, and the comparatively lower importance of employment in entities in mixed ownership, the results of specifications including the share of employment in entities in mixed ownership are not shown, as they do not significantly contribute to the conclusions of the analysis.

TABLE 7

*Change in share of employees by ownership*

Dependent variable	$\Delta$	
	private	state
	M1	M2
Employment growth	0.048*** (0.012)	-0.109*** (0.018)
Private (lagged)	-0.011*** (0.004)	
State (lagged)		-0.014*** (0.004)
Constant	1.512*** (0.328)	0.165 (0.117)
Obs.	222	222
$\chi^2$	26.128***	50.984***

As for the employment share of women, partial coefficient of employment growth variable is insignificant, as well as the initial share of sectoral female employment (table 8). However, the results of ownership variables show that the change in the employment share of women increases (decreases) in economic activities with comparatively higher share of public (i.e. private) sector employees.

TABLE 8

*Change in share of female workers*

Dependent variable	$\Delta$ women	
	M1	M2
Employment growth	-0.009 (0.006)	-0.009 (0.006)
Women (lagged)	-0.001 (0.001)	-0.001 (0.001)
Private	-0.003*** (0.001)	
State		0.003*** (0.001)
Constant	0.151 (0.060)	-0.094 (0.054)
Obs.	222	222
$\chi^2$	17.116***	19.306***

The next table shows the results of regression analysis in which the dependent variables are the changes in shares of employment by different educational attainment levels. Three categories of educational attainment are used: share of employees with high school education, denoted with *secondary*; the group of workers with college or university degree, denoted with *higher*; and the group of employees not included in the first two groups, denoted with *lower* and including workers with basic education and skilled and unskilled workers.

Results show positive and statistically highly significant partial correlation between employment growth and the change in share of workers with higher education, negative for the change in share of employees with secondary and lower educational attainment. This implies that the highly educated workers are more strongly represented among newly employed than among existing employees in sectors with increasing employment, but also among those leaving (or being laid off) in shrinking economic activities. As shown in table 3, there is an overall positive effect on the employment share of workers with higher education. The initial situation is significant only for employees with lower education so that the change in the share of such workers is negatively correlated with their initial share. Another interesting result is the positive partial correlation between the share of employees in the public sector and the change in the employment share of workers with lower education attainments (significant at 5% level), i.e. negative and significant for private ownership. This may indicate that state ownership may be connected with higher level of protection for this group of employees.

**TABLE 9**  
*Change in share of workers by education*

Dependent variable	$\Delta$ higher		$\Delta$ secondary		$\Delta$ lower	
	M1	M2	M3	M4	M5	M6
Employment growth	0.057*** (0.017)	0.058*** (0.017)	-0.047*** (0.018)	-0.047*** (0.018)	-0.016* (0.009)	-0.016* (0.009)
Higher (lagged)	0.005 (0.007)	0.006 (0.007)				
Secondary (lagged)			-0.019 (0.012)	-0.016 (0.012)		
Lower (lagged)					-0.037*** (0.004)	-0.038*** (0.003)
Private	0.000 (0.004)		0.008* (0.005)		-0.003** (0.001)	
State		-0.002 (0.004)		-0.004 (0.005)		0.003** (0.001)
Constant	0.588 (0.364)	0.652*** (0.219)	0.780 (0.576)	1.269* (0.652)	0.047 (0.093)	-0.202** (0.101)
Obs.	222	222	222	222	222	222
$\chi^2$	12.938***	13.307***	11.958***	9.772**	120.823***	128.039***

Table 10 presents the results of the corresponding regression analysis for employment groups by age. It shows that employment growth is positively related to changes in employment shares for younger and older workers, and negatively to changes in the employment shares of workers aged between 25 and 59 (always significant at the 1% level). Initial conditions are negatively correlated and highly significant for the groups of younger employees and those between 25 and 59 years of age, and positive for older employees. Furthermore, employment share changes for the group of younger employees are significantly and positively

related to the share of sectoral employment in privately owned enterprises and negatively to that of employment in the public sector. The opposite result is obtained for older workers, with respect to coefficients of ownership variables. Thus, this employment segment may be better protected in the public sector. One needs to emphasize in the context of the results in table 10, that the change in employment shares by age over time has its own dynamics due to aging of employees, even if there is no new employment or there are no lay-offs.

TABLE 10

*Change in share of workers by age group*

Dependent variable	$\Delta$ age < 25		$\Delta$ age 25-59		$\Delta$ age $\geq$ 60	
	M1	M2	M3	M4	M5	M6
Employment growth	0.018*** (0.004)	0.021*** (0.004)	-0.044*** (0.010)	-0.039*** (0.010)	0.009*** (0.002)	0.008*** (0.003)
Age < 25 (lagged)	-0.140*** (0.010)	-0.129*** (0.010)				
Age 25-59 (lagged)			-0.166*** (0.030)	-0.146*** (0.027)		
Age $\geq$ 60 (lagged)					0.056*** (0.011)	0.052*** (0.014)
Private	0.005*** (0.001)		0.003 (0.003)		-0.001* (0.000)	
State		-0.003*** (0.001)		-0.006*** (0.002)		0.001* (0.001)
Constant	-0.127*** (0.037)	0.160** (0.066)	15.145*** (2.733)	13.688*** (2.437)	0.230*** (0.060)	0.148*** (0.028)
Obs.	222	222	222	222	222	222
$\chi^2$	269.373***	223.359***	55.892***	57.384***	95.759***	81.199***

Table 11 (in three parts) shows the results of estimations investigating the changes in the share of employees by type of contracts. The dependent variable is always the change in the share of employees with fixed term contracts (denoted with  $\Delta fix$ ). The partial correlation of the dependent variable with larger number of explanatory variables is examined in 18 model specifications. All of them have been defined above, except for the share of employees with part time employment, which is denoted with part. It is, thus, examined whether the changes in sectoral shares of fixed term employment differ depending on sectoral employment growth, gender, contractual working time, type of ownership, educational attainment, age and initial sectoral conditions, denoted with  $fix$  (lagged).

There is a positive and highly significant partial correlation between sectoral employment growth and changes in sectoral share of employees with fixed term contracts, across all specifications. This suggests that, in activities with increasing employment, such workers are represented more among newly employed than among existing employees. Conversely, in sectors with declining employment,

employees in this segment are exposed to over-proportional probability of losing their jobs (either by leaving, by being laid off or by not getting contract renewal) or becoming permanently employed (which does not seem very likely in the crisis). The aggregate data in table 3 indicate that this resulted in negative (i.e. positive) net effect on the share of fixed term employees during the first (i.e. last) two years of the crisis. There is no statistically significant correlation with any of the following factors across different specifications: employment share of women, initial share of fixed term employees, share of part time employees, or educational attainment.

**TABLE 11**

*Change in share of employees with fixed term contracts*

Dependent variable	$\Delta$ fix					
	M1	M2	M3	M4	M5	M6
Employment growth	0.066*** (0.016)	0.069*** (0.016)	0.076*** (0.015)	0.080*** (0.015)	0.067*** (0.015)	0.068*** (0.016)
Private	0.010*** (0.002)		0.011*** (0.002)		0.011*** (0.002)	
State		-0.009*** (0.002)		-0.009*** (0.002)		-0.008*** (0.002)
Women	0.003 (0.003)	0.003 (0.003)				
Fix (lagged)			-0.023 (0.014)	-0.016 (0.013)		
Part					0.023 (0.027)	0.036 (0.034)
Constant	-0.409* (0.221)	0.499*** (0.156)	-0.061 (0.142)	0.804*** (0.195)	-0.335*** (0.156)	0.542*** (0.120)
Obs.	222	222	222	222	222	222
$\chi^2$	51.321***	44.960***	51.958***	44.642***	44.163***	38.259***
	M7	M8	M9	M10	M11	M12
Employment growth	0.074*** (0.016)	0.078*** (0.015)	0.071*** (0.016)	0.073*** (0.015)	0.074*** (0.016)	0.078*** (0.016)
Private	0.009*** (0.002)		0.009*** (0.002)		0.010*** (0.002)	
State		-0.007*** (0.002)		-0.006*** (0.002)		-0.008*** (0.002)
Higher	-0.002 (0.004)	-0.004 (0.004)				
Secondary			0.005 (0.006)	0.009 (0.006)		
Lower					0.001 (0.005)	0.002 (0.005)
Constant	-0.177 (0.174)	0.658*** (0.140)	-0.449 (0.289)	0.125 (0.366)	-0.277 (0.190)	0.529*** (0.150)
Obs.	222	222	222	222	222	222
$\chi^2$	43.513***	39.010***	43.063***	38.301***	45.390***	40.006***

Dependent variable	Δ fix					
	M13	M14	M15	M16	M17	M18
Employment growth	0.068*** (0.015)	0.067*** (0.015)	0.069*** (0.015)	0.071*** (0.015)	0.071*** (0.015)	0.074*** (0.015)
Private	0.006** (0.003)		0.010*** (0.002)		0.009*** (0.003)	
State		-0.003 (0.002)		-0.008*** (0.002)		-0.006** (0.003)
Age < 25	0.081** (0.032)	0.100*** (0.031)				
Age 25-59			-0.052* (0.028)	-0.065** (0.027)		
Age ≥ 60					-0.015 (0.041)	-0.035 (0.043)
Constant	-0.349** (0.143)	-0.003 (0.194)	4.552* (2.530)	6.551*** (2.470)	-0.151 (0.279)	0.674*** (0.147)
Obs.	222	222	222	222	222	222
$\chi^2$	44.433***	43.658***	46.252***	44.509***	42.705***	37.323***

As for the employment by age, sectors with higher shares of younger workers experience stronger positive change in fixed term employment shares (other things held equal), which is also statistically significant. The coefficient for the other two age groups is negative and significant only for employees between 25 and 59 years of age. The results according to employment by ownership display a clear pattern across specifications: comparatively higher share of employees in the private sector is always positively and significantly correlated with the change in the share of fixed term employment; while the coefficients for state ownership are negative and significant in all models except for M14.

One thing should be noted here: table 11 gives results on the changes in employment shares by type of employment, using the change in the share of employees with fixed term contracts as a dependent variable. However, it is possible to perform the whole analysis with a change in share of employees for an unspecified period of time. The results are not shown because they closely mirror the presented results, with opposite signs for all the estimated coefficients except for the coefficient of the variable capturing initial conditions.

Table 12 shows the results of the analysis for contractual working time, using the change in sectoral share of part time employees as a dependent variable. Again, the estimated coefficient for the employment growth variable is significant and positive, in all specifications except for the first two which control for the employment share of women, implying that there is an over-proportionate share of the part time workers among newly employed (as compared to their existing share) in sectors with increasing employment. Vice versa, in sectors with declining employment, part time employees are exposed to over-proportional

probability of losing a job or leaving for other reasons (or else of becoming employed as full time workers).

Employment share of part time workers is positively and significantly related to the employment share of women, initial share of part time employees, share of workers with fixed term employment and those with higher educational attainment. It is negatively and significantly correlated with the share of employees with lower education. There is always a positive (i.e. negative) partial correlation coefficient between the change in part time employment and the share of private (i.e. public) sector employees, but these coefficients are only significant in some specifications, while the coefficients for employment by age variables never turn significant.

Again, it should be noted that the whole analysis by contractual working time could be performed using the change in the share of full time employees as a dependent variable. The results are not shown because they closely resemble the presented results, but with opposite signs for most of the estimated coefficients (except for the coefficient of the variables capturing initial conditions) leading to the same conclusions.

**TABLE 12**  
*Change in share of employees in part time employment*

Dependent variable	$\Delta$ part					
	M1	M2	M3	M4	M5	M6
Employment growth	0.003 (0.002)	0.003 (0.002)	0.006** (0.003)	0.006** (0.003)	0.006*** (0.002)	0.006*** (0.002)
Private	0.001 (0.000)		0.001* (0.001)		0.000 (0.000)	
State		-0.000 (0.000)		-0.001 (0.001)		-0.000 (0.000)
Women	0.003*** (0.001)	0.003*** (0.001)				
Part (lagged)			0.030* (0.017)	0.034** (0.017)		
Fix					0.007** (0.003)	0.007*** (0.003)
Constant	-0.002 (0.034)	0.045 (0.029)	0.055 (0.041)	0.134*** (0.031)	0.038 (0.029)	0.058* (0.032)
Obs.	222	222	222	222	222	222
$\chi^2$	22.087***	20.404***	19.495***	17.079***	17.968***	16.479***
	M7	M8	M9	M10	M11	M12
Employment growth	0.006*** (0.002)	0.007*** (0.002)	0.007*** (0.002)	0.007*** (0.002)	0.006** (0.002)	0.006*** (0.002)
Private	0.001*** (0.000)		0.001** (0.000)		0.001** (0.000)	

Dependent variable	$\Delta$ part					
	M7	M8	M9	M10	M11	M12
State		-0.001** (0.000)		-0.001 (0.000)		-0.001 (0.000)
Higher	0.003*** (0.001)	0.002** (0.001)				
Secondary			-0.001 (0.001)	-0.000 (0.001)		
Lower					-0.002** (0.001)	-0.001* (0.001)
Constant	-0.005 (0.041)	0.117*** (0.020)	0.118** (0.060)	0.177*** (0.065)	0.127*** (0.035)	0.196*** (0.028)
Obs.	222	222	222	222	222	222
$\chi^2$	25.524***	20.988***	13.221***	11.181**	24.518***	21.282***
	M13	M14	M15	M16	M17	M18
Employment growth	0.008*** (0.002)	0.008*** (0.002)	0.008*** (0.002)	0.008*** (0.002)	0.008*** (0.002)	0.008*** (0.002)
Private	0.001 (0.001)		0.001* (0.000)		0.001 (0.000)	
State		-0.000 (0.001)		-0.001 (0.000)		-0.000 (0.001)
Age < 25	0.005 (0.005)	0.008 (0.005)				
Age 25-59			-0.003 (0.006)	-0.005 (0.005)		
Age $\geq$ 60					-0.006 (0.007)	-0.008 (0.007)
Constant	0.076** (0.031)	0.108*** (0.034)	0.354 (0.528)	0.630 (0.485)	0.118** (0.052)	0.180*** (0.026)
Obs.	222	222	222	222	222	222
$\chi^2$	22.163***	21.312***	20.064***	18.724***	22.929***	21.945***

## 5 DISCUSSION OF RESULTS, SUMMARY OF CONCLUSIONS AND POLICY IMPLICATIONS

The goal of this research was to assess the impact of the current economic crisis on employment and employment conditions in Croatia. Based on the observed trends, descriptive statistics and regression results, certain conclusions emerge.

There has been a significant decline in aggregate employment since the beginning of the crisis, reflected in steadily increasing unemployment and decreasing employment rates. The change in trend of employment, as compared to the pre-crisis period when it was increasing, was more pronounced for the segment of employees in crafts, trades and freelance occupations than for the comparatively larger segment of employees in legal persons. Unlike these two categories of employment, decline in the segment of insured private farmers during the crisis was a continuation of the pre-crisis trend. Employment growth (in legal persons) is

shown to be significantly determined by contemporaneous and lagged changes in economic conditions, as captured by the real gross value added growth.

Especially during the first two years of the crisis, adjustment to worsening economic conditions was primarily brought about through employment cuts. This is in line with the conclusions from Matković, Arandarenko and Šošić (2010) and Cho and Newhouse (2013) for the group of Eastern European countries. However, in 2011 the intensity of decline in employment and real earnings was roughly the same, while in 2012 decline in real wages turned out stronger. One can observe some heterogeneous developments of employment and wages across sectors of economic activities. Although this is expected given that they were not equally exposed to negative economic shocks, there are also indications of different sectoral adjustment patterns. During the crisis, jobs were lost in the private sector and in entities in mixed ownership, while the number of jobs in the public sector (entities in state ownership) slightly increased. There seems to have been greater labor dynamics in the private sector segment, as the employment share of private sector workers increased (decreased) in economic activities with positive (negative) employment growth.

The growth of sectoral real wages in the crisis is positively and significantly related to the growth of the macroeconomic wage, underlining the importance of broader macroeconomic conditions for sectoral wage dynamics found in earlier research (Vukšić, 2012). There is also a positive and significant partial correlation between employment and wage growth. Results of wage dynamics analysis further indicate the existence of a gender wage gap and an educational wage premium. Wage growth in the crisis is negatively related to the sectoral share of private sector employees; and positively to share of workers in entities in mixed ownership. Results for wage growth in the public sector (entities in state ownership) are similar to those for the private sector, but the relationship is weaker and statistically less convincing.

As for the impact of the crisis on female workers, their aggregate employment share has been increasing. This is the consequence of the fact that the economic activities with comparatively larger share of women employment have experienced fewer employment cuts, or comparatively higher employment growth. Furthermore, increases in their employment share were stronger in economic activities with comparatively higher shares of public sector employment.

Aggregate data on employment by age groups show a declining share of younger workers (younger than 25) and an increasing shares of workers aged between 25 and 59, and, even more pronounced, of older workers (aged 60 or older) during the crisis. These trends of aggregate shares may result from the low number of new job openings and the fact that the existing workers naturally shifted to older age categories. The share of employees aged between 25 and 59 decreases with

increasing sectoral employment, while the opposite effect can be observed for the other two groups. In addition, change in the shares of young employees is positively (negatively) related to the share of private (public) sector workers, while the opposite holds true for older employees aged 60 or older.

Data show that employees with comparatively lower educational attainments face severe challenges in the labor market. This is a longer term trend, not specific to the crisis period, as the aggregate share of employees with basic education and of skilled and unskilled workers has been declining steadily since the year 2000. The corresponding shares for employees with secondary education and those with higher educational attainment show the opposite trend. More detailed data for the years of crisis show that sectors with higher shares of workers with higher education experienced fewer employment cuts, or higher employment growth rates. Results of regression analysis imply that employees with higher education are more strongly represented among newly employed than among existing employees in sectors with increasing employment, but also among those leaving (or being laid off) in shrinking economic activities. The opposite holds true for workers with lower and secondary education. Results also indicate that state ownership may be connected with a higher level of protection for the group of employees with lower educational attainment.

Data on workers employed for a fixed period of time show that their share has increased in the last two years of the crisis, after a slight decline in 2009 and 2010. One explanation might be that these were the first to be laid off in the beginning of the crisis, but that in later years, the relative importance of this type of employment among the newly employed increased. Regression analysis shows that, in activities with increasing employment, fixed term employees are represented among new employees proportionally more than among existing workers. Conversely, in sectors with declining employment, this segment of employees is exposed to over-proportional probability of losing a job (either by being laid off, or by not getting contract renewal), leaving for other reasons, or becoming permanently employed (which does not seem very likely in the times of crisis). Sectors with higher shares of younger workers experience stronger increases in fixed term employment shares. The results according to employment by ownership clearly show that comparatively higher share of employees in private sector is always associated with stronger increases in share of fixed term employment. This indicates that the increasing importance of this, more flexible form of employment (during the last two years of the crisis), has been stronger in the more dynamic labor market segment, i.e. private sector, during the crisis.

The share of full time employees was rather constant in the pre-crisis period and exceeded the value of 98% in each of these years. In the crisis, however, this share declined slightly but steadily. The share of part time employees rose correspondingly and although it is still very small, it has increased substantially during the

crisis. Results of regression analysis imply that there is an over-proportionate share of part time workers among newly employed in sectors with increasing employment, i.e. that in sectors with declining employment, part time employees are exposed to over-proportional probability of losing a job or leaving for other reasons (or becoming employed as full time workers). The increasing importance of this more flexible form of employment, i.e. of working part time, during the crisis, was stronger in economic activities with comparatively high shares of women employees, of workers with higher education and fixed term employees.

Data on hours worked do not display any strong upward or downward trends, not overall, nor in the periods before and during the crisis. There is a slight decline in average number of hours and the hours actually worked in the crisis, but this is not something specific to the crisis period. The only exception in this respect may be the number of overtime hours per worker with a significant decline during the crisis.

From the above discussion, the main findings of the analysis can shortly be summarized as follows:

- The primary (aggregate) mode of adjustment to the crisis was a decline in employment, although the intensity of decline in real wages exceeded that of employment reduction in the last observed year, i.e. 2012. There are, however, considerable differences in adjustment patterns across economic activities.
- During the crisis, jobs were lost in the more dynamic private sector, while the number of jobs in the public sector (entities in state ownership) slightly increased. Jobs were also lost in entities in mixed ownership during the crisis, but this is a continuation of a longer term trend.
- Economic activities with comparatively larger shares of women in employment have experienced fewer employment cuts and the aggregate employment share of women rose in the crisis. Their share increased more strongly in activities with a larger share of public sector workers.
- There is a declining share of younger workers during the crisis.
- Employees with comparatively lower educational attainments face severe challenges in the labor market, which is a longer term trend, not specific to the crisis period. There are indications that this group of employees enjoys a higher level of protection in the public sector.
- Analysis also shows a rising significance of more flexible forms of employment: the share of fixed term employees has been increasing during the last two observed years, especially in economic activities with larger shares of private sector employment and younger workers. Similarly, the share of part time workers increased during the crisis, particularly in activities with comparatively large shares of women employees, those with higher education and fixed term employees.

- Working hours do not exhibit any strong trends specific to the crisis, except for the diminishing number of overtime hours per worker.

The fact that the intensity of adjustment to crisis on the employment side has been stronger than on the side of wages (mostly during the first two years of the crisis) implies that the costs of crisis have been unevenly shared among workers in the sense that some lost all of their labor income. This puts the unemployment benefits aspect of the social system at the center of interest, i.e. policies which should mitigate the negative consequences of complete, or at least severe, labor income losses (see Khanna, Newhouse and Paci, 2010). However, instead of discussing the efficiency of possible models of compensating for income losses of the laid off workers, one might want to consider possibilities of mitigating the income losses in the first place. In the context of the concentration of social consequences to laid-off workers, Matković, Arandarenko and Šošić (2010) suggest that it increases the general level of insecurity and that the alternative to it is to have a more even distribution of risks, e.g. through a social pact on wages or measures relating to the efficient distribution of working hours. One could state more generally that labor market policies increasing the flexibility of wages or working hours may contribute to such a more even distribution of risks resulting from negative labor market trends. However, even if wages are rigid, government may use fiscal instruments to lower labor costs generally, by altering the structure of budget revenues and shifting the tax (including social contributions) burden away from labor income. This could have positive effects on labor demand and it could make it easier for employers to keep more workers in the present crisis. Unfortunately, the only policy measure in this direction (reduction of health insurance contributions paid by the employer by 2 percentage points from May 2012), turned out to be only temporary.

Results also indicate that the situation for young workers deteriorated significantly during the crisis. This in turn requires policy makers to take more active roles and come up with tailored measures facilitating employment for this age group, and/or promoting their further education. The latter should relieve the pressures on the labor supply side, and increase young people's employment chances in future as the evidence shows a clear trend of stronger demand for workers with higher educational attainments (this also presents an argument to promote more adult education and lifelong learning). A policy measure facilitating the hiring of young workers without previous work experience was adopted in May 2012,<sup>15</sup> enabling employers to hire young workers registered at the Croatian Employment Service for one year (or two in some cases) without signing a labor contract. The employer is only obliged to pay for retirement insurance contributions, while other costs are borne by the state. The measure has been criticized by some, suggesting that it can lead to misuse in private sector and reduce chances of young

<sup>15</sup> "The Law on Stimulating Employment" has been published in the Official Gazette No. 57, 2012. This act also contains provisions facilitating the employment of long-term unemployed persons.

workers getting regular employment (Clauwaert and Schömann, 2013). There are a number of other active policies and programs (see discussions in Ha et al., 2010; or in Scarpetta, Sonnet and Manfredi, 2010) which can be implemented in order to relieve young workers of their present hardships, and, thus, prevent their longer term unemployment with longer term consequences for the whole society.

## APPENDIX

### EMPLOYMENT DATA

**Persons in employment** are persons who have signed a work contract with the employer for a fixed or unspecified period of time, irrespective of their contractual working time or of the type of ownership of the business entity. Persons in paid employment include trainees, persons on maternity or paternity leave, on sick leave or absent from work for other reasons, until the cessation of employment. They also include self-employed persons who work in their own trade company, enterprise, craft or freelances.

**Owners** of craft and trade or freelance shops are persons who have established with their own means, a shop or a freelance occupation where they, in their own name and on their account, perform an activity, alone or with employees.

**Employees in crafts and trades and freelance occupations** are persons who have signed a work contract with an employer for a fixed or specified period of time.

**Insured private farmers** are employed persons performing agricultural activity as the sole occupation as landowners, tenure holders or holders of concessions to agricultural land.

**Educational (professional) attainment** is the highest level of education acquired by a person upon completing an appropriate school or course, sitting for exams or receiving recognition based on proving professional attainment in a business entity. The level acquired can be proved by the appropriate official document (diploma, certificate, degree). CBS distinguishes between ten different levels of educational attainment in its data, which are grouped for the needs of the present study in the following way: higher education (doctors, masters, others with university degree and those with non-university college education); secondary education; and basic education including skilled and unskilled workers (basic school education, highly skilled, skilled, semi-skilled and unskilled). The group of employees with basic education, including skilled and unskilled workers is referred to as the group of employees with lower educational attainment.

**Full time work** lasts 40 hours a week, if not prescribed otherwise by law, collective agreement or work contract.

**Part time work** is practiced in the case when the quantity of work is such that it does not need full working time to be completed.

**Short time work** is practiced in the case when the nature of work is such that the employee cannot be protected from harmful effects by safety measures at work.

**Hours actually worked** include effective hours of work, hours of waiting, stoppage or interruption at work which employees are not responsible for.

**Hours not actually worked** which are paid in a legal entity include hours of vacation, holidays and days off prescribed by law, professional education, sick leave covered by a legal entity, paid leave and other absent hours paid.

**Hours not actually worked which are paid out of a legal entity** include sick leave of 42 days and longer, maternity leave, hours of parent short time work, etc.

**Non-paid hours** include non-paid leave and other hours not actually worked for which no pay is received.

#### WAGES

**Gross monthly earning (gross wages)** covers everything that is included in the monthly paid net earnings (earnings of persons in paid employment in legal entities earned for work done during regular working hours, and pays for annual leave, paid leave, public holidays and free days established by the law, sickness pay for up to 42 days, absence for the continuing professional education, job stoppages caused against a person's will or no fault of his own and receipts on the basis of reimbursements, supports and awards in amounts for which contributions, taxes and surtaxes must be paid) plus participation, co-payments, contributions and taxes, as prescribed by law.

*Source of definitions: Croatian Bureau of Statistics (CBS): Statistical Yearbook of the Republic of Croatia (chapters: 6. Employment; and 7. Earnings and labor costs).*

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# Employment protection legislation in Croatia

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## Abstract

*According to business climate and competitiveness indicators published by international organisations, Croatia is a country with a rigid labour market and a high level of the legal protection of employees. Given that an Act on Amendments to the Labour Act (OG 73/13) entered into force in Croatia in June 2013, this paper examines changes in employment protection legislation in Croatia and Central and Eastern European (CEE) countries, as well as in Croatia's main trading partners during the period between 2008 and 2013. A cross-country comparison shows a strong downward trend in legal employment protection in most CEE countries during the observed period, primarily as concerns individual dismissal in the cases of regular employment contracts, while in the case of temporary employment the protection strengthened slightly. On the other hand, despite the adoption of amendments to the Labour Act (LA), Croatian labour legislation governing employment protection for regular employment contracts remains relatively inflexible compared to that in other countries.*

*Keywords: Employment Protection Legislation Index, labour market rigidity, Labour Act, regular and temporary contracts, collective dismissals, Central and Eastern Europe, Croatia*

## 1 INTRODUCTION

Changes in the labour legislation aimed at labour market flexibilisation have been among the most popular structural reforms in Europe after the outbreak of the financial and economic crisis. Croatia is no exception in this regard. The Act on the Criteria for Participation in Tripartite Bodies and Representativeness for Collective Bargaining, passed in mid-2012, repealed the possibility of an open-ended application of legal rules from expired or terminated collective agreements. In the same year, an Employment Promotion Act was passed, expanding the previous active labour market policy measures with a view to reducing both cyclical and structural unemployment through employment promotion programmes for long-term unemployed persons and a “vocational training without employment relationship” programme. A new Act on Amendments to the Labour Act (OG 73/13) was introduced in June 2013, whose main purpose was not only to harmonise the Croatian labour market regulations with those of the EU but also to increase labour market flexibility. Moreover, the second phase of the LA reform has been announced, expected to result in further flexibilisation of labour legislation. Despite initial announcements that the second part of amendments to the LA would be adopted by end 2013, this has not come true yet, neither was it clear, at the time of writing this paper, when further changes to the Act could be expected.

Many international institutions reiterate the importance of implementing structural labour market reforms in Croatia. The International Monetary Fund, for example, within its regular consultations, emphasizes the necessity for labour market

reforms<sup>1</sup>, and the European Commission, in its Recommendations (2013:19), suggests that it is the labour market reforms that should be given greater importance within the 2013 Economic Programme for Croatia. It is a common perception among professionals but also the wider public that Croatia's labour market is inflexible and burdened by heavy hiring and dismissal costs.

Taking this into consideration, the author assesses different employment protection legislation indexes for Croatia before and after the adoption of Amendments to the Labour Act in June 2013, and analyses the flexibility of Croatian labour legislation as compared to that in other countries. The paper assesses the OECD<sup>2</sup> Index of Employment Protection for regular open-ended contracts, including collective dismissals (EPRC) and Index of Employment Protection for temporary contracts (EPT), based on an analysis of the Labour Act. Moreover, the Ease of Employment Index has been estimated, based on a data base published by the World Bank.<sup>3</sup>

It has been estimated that the EPRC index for Croatia declined slightly, from 2.9 in 2008 to 2.7 in 2013, as a result of reforms in the area of collective dismissals. If only regular contracts are taken into account, this area of labour legislation has remained unchanged from 2008, which is in contrast with the reforms carried out in most other countries (Slovakia, Hungary, Czech Republic, Estonia, Italy and Slovenia), which decreased employment protection for regular contracts in the reference period. By contrast, due to a revision of Article 10 of the LA which governs fixed term contracts, the Employment Protection Index for temporary contracts dropped from 2.2 in 2008 to 2.0 in 2013, so that in 2013, Croatia's EPT was in line with the peer countries' average.

The assessment of the employment protection legislation indexes for Croatia was followed by their detailed analysis aimed at establishing which legal provisions resulted in labour market inflexibility even after the adoption of amendments to the LA. It was found that Croatia was more rigid than other countries in respect of employment protection for regular contracts, due to complicated hiring and dismissal procedures, according to which employment contract cannot be terminated before the person is retrained and reassigned to another position, and in the case of termination of an employment contract, the employer is obliged to take into account the person's age and length of service. In the case of reemployment, priority rules for redundancies apply, i.e. where an employee is dismissed on business grounds, the employer is not allowed to hire another employee for the same job for six months. Furthermore, the employer is required to notify not only the employee but also the workers' council of his/her intention to terminate an em-

<sup>1</sup> For more information, see the IMF website at: <http://www.imf.org/external/country/HRV/index.htm>; IMF Staff visit reports on Article IV Consultations, Croatia.

<sup>2</sup> For more details, see: OECD (2013) and (2013a).

<sup>3</sup> For more details, see: World Bank (2014).

ployment contract. These procedures are more rigid in Croatia than in other CEE countries.

In addition to the OECD EPRC and the EPT indexes, this article briefly analyses the World Bank's Ease of Employment Index which allows a comparison with a larger number of countries. It has been estimated that Croatia ranked 161<sup>th</sup> on the ease of employment among 189 countries at the beginning of 2013, and 146<sup>th</sup> after the adoption of Amendments to the LA in June 2013 (this estimations are based on the assumption that the labour legislation in all peer countries remained unchanged during 2013). The findings of the Ease of Employment Index analysis also show that the Croatian labour market is extremely rigid compared to peer countries, especially as concerns hiring and firing regulations.

This article complements the existing literature (Biondić et al., 2002; Matković and Biondić, 2003; Tonin, 2009; and CNB, 2013) on the (in)flexibility of labour legislation and labour market in Croatia. Biondić, Crnić and Martinis (2002), assess the flexibility of labour legislation on the basis of the Labour Act of 2001 (OG 82/01), Matković and Biondić (2003) on the basis of the LA of 2003 (OG 114/03), and Tonin (2009) on the basis of the LA of 2004 (OG 137/04), while CNB, makes the assessment on the basis of the LA of 2009 (OG 149/2009). To the knowledge of the author, this is the first research work dealing with labour market flexibility which takes into account changes resulting from the Act on Amendments to the Labour Act in 2013 (OG 73/13). Furthermore, the article provides a detailed description of the OECD EPRC and EPT indexes, as well as the World Bank's Ease of Employment Index, used as indicators of the strictness of labour legislation, which is also a novelty in the relevant domestic literature. Therefore, this article features the latest and most comprehensive assessment of the available international labour market rigidity indexes.

## 2 EMPLOYMENT PROTECTION LEGISLATION

The legal framework regulating the hiring, dismissal and other procedures related to the labour market is supposed to ensure timely adjustment of the labour market to fluctuations in the economic activity, while maintaining an adequate level of protection of employees (OECD, 2013).<sup>4</sup> Given the variety of current legal systems and individual laws governing the labour market, the OECD used to assess and publish an Employment Protection Legislation Index (EPL) which allowed a cross-country comparison of the labour legislation. The EPL index comprised a wide range of indicators that could be grouped into three main employment protection categories: regular contracts, temporary contracts and collective dismissals. The overall index was calculated as the weighted average of these indicators. The relative significance of individual indicators was determined using a detailed methodology.<sup>5</sup> The overall EPL index could have values from 0 to 6, where a low

<sup>4</sup> For more details, see OECD (2013).

<sup>5</sup> For more details, see Venn (2009:39-45) and CNB (2013).

index value indicated flexible labour legislation, and vice versa. The index was assessed at a four-year interval for the previous four-year period, and was published in the above-described form from 1985 to 2008. While the OECD published no EPL index for Croatia, its values were estimated at three occasions, suggesting extremely strict labour legislation. The EPL index for Croatia was first estimated in 2002, when it stood at 3.58 (Biondić, Crnić and Martinis, 2002), and then in 2003, after the passing of the Act on Amendments to the Labour Act (OG 114/03), when it dropped to 2.76 (Matković and Biondić, 2003), mainly due to the introduction of legislation on temporary work agencies, the activities of which have not been previously regulated by law. Tonin (2009) estimated the EPL index for Croatia using the LA of 2004, i.e. its articles relevant for the determination of the EPL index which were the same as those used in the paper by Matković and Biondić (2003). However, due to a slightly different interpretation of some articles, the obtained EPL value was slightly lower, 2.7. During 2008, the OECD modified its EPL index assessment methodology, by including three additional indicators. As a result, the index assessed on the basis of the LA (OG 149/2009) and the new methodology stood at 2.61 (CNB, 2013).

In July 2013, after a four-year break, the OECD published its updated information on employment protection legislation for the previous four-year period, based on a new approach regarding the assessment of individual indicators relevant for the evaluation of employment protection legislation. According to the new approach, the labour market legislations were primarily examined by OECD experts, while in the previous cases, data had been obtained by the competent national institutions. This change resulted in the uniform interpretation of the relevant laws and application of the OECD methodology itself, which allowed a better cross-country comparison of the labour market legislation. Due to changes in data collection and the evaluation of indicators, the already published data for 2008<sup>6</sup> have been revised. Hence, it is worthy of note that the estimates for Croatia deviate from those based on the OECD methodology, since they were not made by OECD experts. Instead of this, the values of individual indicators for Croatia are author's estimates based on the relevant provisions of the Croatian LA and her interpretation of the OECD methodology.

Besides this methodological change, another novelty, crucial for the interpretation of employment protection legislation was introduced in 2013. While the availability of underlying indicators for the assessment of the EPL index remained unchanged from 2008, the EPL value was no more available and was not published. Instead, two summary indexes were considered alternatively: the index of employment protection for regular contracts, including collective dismissals (EPRC) and index of employment protection for temporary contracts (EPT). The new me-

<sup>6</sup>For further details about methodological changes in the assessment of the Employment Protection Legislation Index, see OECD (2013:76-77).

thodology for calculating the two key summary employment protection indexes is presented in tables 1 and 2.

**TABLE 1**

*Construction of the summary Index of Employment Protection for regular contracts, including collective dismissals*

<b>Index of Employment Protection for regular contracts, including collective dismissals (EPRC)</b>	<b>Index of Employment Protection for regular contracts (EPR) (5/7)</b>	Procedural inconveniences (1/3)	Notification procedures (1/2) Delay involved before notice can start (1/2)
		Notice and severance pay for no-fault individual dismissals (1/3)	Notice period after 9 months tenure (1/7) Notice period 4 after years tenure (1/7) Notice period after 20 years tenure (1/7) Severance pay after 9 months tenure (4/21) Severance pay after 4 years tenure (4/21) Severance pay after 20 years tenure (4/21)
<b>Index of Employment Protection against collective dismissals (EPC) (2/7)</b>	<b>Index of Employment Protection against collective dismissals (EPC) (2/7)</b>	Difficulty of dismissal (1/3)	Definition of justified or unfair dismissal (1/5) Length of trial period (1/5) Compensation following unfair dismissal (1/5) Possibility of reinstatement following unfair dismissal (1/5) Maximum time to make a claim of unfair dismissal (1/5)
		Collective dismissals	Definition of collective dismissal (1/4) Additional notification requirements (1/4) Additional delays involved before notice can start (1/4) Other special costs to employers (1/4)

Source: OECD (2013a).

**TABLE 2**

*Construction of the summary Index of Employment Protection for temporary contracts*

<b>Index of Employment Protection for temporary contracts (EPT)</b>	Fixed term contracts (1/2)	Valid cases for use of fixed-term contracts (FTC) (1/2) Maximum number of successive FTC (1/4) Maximum cumulated duration of successive FTC (1/4)
	Temporary work agency employment (1/2)	Types of work for which temporary work agency (TWA) employment is legal (1/3) Restrictions on number of renewals (1/6) Maximum cumulated duration of TWA assignments (1/6) Does the set-up of a TWA require authorisation or reporting obligations (1/6) Do regulations ensure equal treatment of regular and agency workers at the user firm (1/6)

Source: OECD (2013a).

According to OECD (2013), the main reason for non publishing of the overall EPL index is the fact that all implemented reforms do not have equal effects on the labour market, neither can these effects be unambiguously quantified and measured. Therefore, introducing two alternative indexes should provide a better insight into the labour market flexibility. Thus, for example, the results of the flexibilisation of employment protection for temporary contracts will depend on the concurrent employment protection for regular contracts. Aoyagi and Ganelli (2013) demonstrate on a panel of OECD countries that a high level of employment protection for regular contracts combined with a low level of protection for temporary contracts results in labour market dualism. Literature offers many studies on adverse aspects of dual labour markets. Khan (2010), for example, shows that deregulation of temporary contracts increases the share of such contracts in total employment, yet without any major influence on the total number of employed persons. Boeri and Garibaldi (2007) came to the same conclusion, showing that the flexibilisation of the labour market “at the margin” (only for temporary forms of employment, such as fixed term contracts) initially results in higher overall employment, but this “honey moon effect” wears off eventually and regular employees are replaced by those employed on temporary contracts. Furthermore, numerous studies (Bentolila and Dolado, 1994; Blanchard, 2002) suggest that labour market dualism results in lower productivity, which, in the long run, reduces economic growth rates. Dualism also has a strong effect on wage dynamics in the labour market. Boeri (2011) demonstrates that there is a wage premium for regular employment contracts, as opposed to temporary contracts. The premium ranges from 6.5% in England to a high of 45% in Sweden.<sup>7</sup>

The substitution between temporary and regular employment can be avoided if the relative flexibility of both types of contracts is equal. Otherwise, dual markets will develop, with outstanding protection of persons employed on regular contracts and poor protection of those employed on temporary contracts, who will bear the full burden of a possible adjustment in the number of employees in times of crisis.

With all this said, in an environment of inflexible labour legislation, the flexibilisation of only the part of the legislation which governs temporary employment will have no major effect on the labour market, but it can lead to a decrease in the EPL value, which, in turn, can distort conclusions about the desirability of certain reforms for labour legislators. Therefore, the OECD has recommended that the EPL index, as an indicator of employment protection legislation be abandoned, and that the EPRC and EPT indexes be used, as they provide a parallel insight into the movements of employment protection legislation for both regular and temporary contracts.

<sup>7</sup> In contrast to the above mentioned papers, the author of this article assesses some labour market flexibility indicators, but the article does not explore the interconnection between the values of selected flexibility/rigidity indicators and labour market outcomes (employment dynamics, employment rate, unemployment rate, etc.).

Another motive for introducing the two alternative summary indexes which provide a better insight into the labour market flexibility is the fact that, during the recent crisis, many countries carried out labour legislation reforms in order to remove rigidities, improve their international scores and, consequently, become more attractive to investors. Therefore, such indexes make it easier to detect the areas of labour legislation which have been reformed.

Each of the indicators included in the assessment of summary EPRC and EPT indexes, as well as the summary indexes themselves, can take on a value between 0 and 6, where low-value indicators or indexes are assigned to countries with flexible labour legislation, and high values of indicators/summary indexes suggest inflexible legislation<sup>8</sup>.

Using the relevant versions of the LA, the summary EPRC and EPT indexes for Croatia have been estimated, and the country's position has been analysed in relation to comparable countries and the main trading partners in 2008 and 2013, i.e. immediately before and after the outbreak of the crisis. CEE countries – new EU Member States with similar transition processes, in terms of institutional and economic characteristics, were chosen as comparable countries for Croatia. Also included were Croatia's main trading partners, given that labour cost is one of the key determinants of cost competitiveness, and high level of employment protection results in high employer costs of hiring/dismissal. This implicitly increases labour cost and distorts a country's cost competitiveness relative to its trading partners.<sup>9</sup>

The 2008 data for Croatia were taken from the LA (OG 149/09) and the sources of data for 2013 were all the relevant amendments to the LA, adopted by July 2013. This made it possible to quantify the effects of reforms carried out pursuant to Amendments to the Labour Act, adopted in June 2013 (OG 73/13). Although this paper is based on the 2009 LA (OG 149/09), which became applicable as late as January 2010, as all the relevant items used for calculating the summary employment protection indexes are the same in both the LA of 2009 (OG 149/09) and LA of 2004 (OG 137/04), the results are considered valid for 2008 as well. Moreover, given that most other observed countries implemented labour legislation reforms in the specified period, with a view to increasing labour market flexibility, the analysis was focused on the relative change in Croatia's position compared to the selected countries.

<sup>8</sup> The OECD compiles and publishes 21 indicators and two aggregate indexes for the OECD members, as well as Argentina, Brazil, China, India, Indonesia, Latvia, Russia, South Africa and Saudi Arabia.

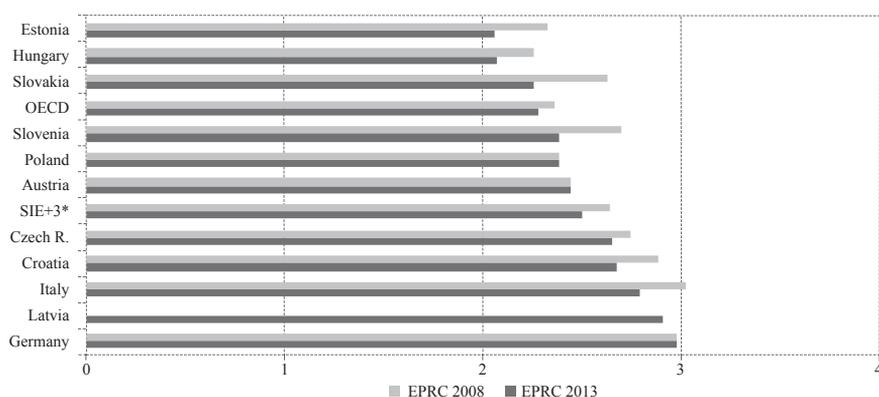
<sup>9</sup> The main trading partners have been determined on the basis of direct import and export competitiveness and export competitiveness in third markets. The OECD publishes data for Slovenia, Poland, Estonia, Czech Republic, Slovakia, Hungary and Latvia (post-communist EU Member States), as well as Italy, Austria and Germany (Croatia's main trading partners).

### 3 CHANGES IN EMPLOYMENT PROTECTION FOR REGULAR CONTRACTS, INCLUDING COLLECTIVE DISMISSALS

As shown in chart 1, in the period immediately before the crisis, Croatian employment protection legislation for regular contracts, including collective dismissals was stricter than that in other countries, with the EPRC index standing at 2.9 (the observed countries' average was 2.6 and the average for OECD countries 2.4). Accordingly, Croatia was among the most rigid countries in the observed group, along with Italy and Germany, while new EU Member States were much more flexible.

#### CHART 1

*Summary Index of Employment Protection for regular contracts, including collective dismissals for Croatia and selected countries, 2008 and 2013*



\*SIE+3 stands for a simple value average for Czech Republic, Estonia, Latvia, Hungary, Poland, Slovakia, Slovenia and Croatia (CEE countries) and Austria, Italy and Germany (Croatia's main trading partners).

The value of 4 indicates extremely strict labour legislation and the value of 0 extremely flexible legislation.

Sources: OECD (2013c) and author's estimate for Croatia.

Amendments to the Labour Act (OG 73/13) led to a change in the collective redundancy procedure, which had a direct effect on the EPRC index because of a change in the indicator measuring additional delays in the start of the notice period in the case of collective dismissals. According to the OECD methodology, where an additional delay in the notice period in the case of collective dismissals (respective to regular dismissals) is not possible, the relevant indicator takes on the value of 0. For possible delays of 25, 30, 50, 70 and 90 days, the relevant indicators take on the values of 1, 2, 3, 4 and 5 respectively. If the possible delay is longer than or equal to 90 days, the indicator takes on the value of 6. Since the public employment service was authorised to order an additional 3-month delay in the notice period in the case of collective dismissals, this indicator for Croatia took on the value of 6. Pursuant to Amendments to the LA (OG 73/13), the addi-

tional delay in the notice period, to be determined by the public employment service in exceptional cases, for all employees who are offered a redundancy programme, has been reduced from 90 to 30 days. However, besides this additional delay of notice period decided by public employment service, pursuant to Article 112, paragraph (3) of the Act, an employer may not dismiss employees who have been offered a redundancy programme before the expiry of thirty days from the delivery of the programme to the competent public employment service. Thus, it can be concluded that the total additional delay period in the case of collective dismissals is 60 days. If the total delay period in the case of collective dismissals is compared with regular delays in the start of the notice period for regular employment contracts (10 days<sup>10</sup>), the additional delay in the case of collective dismissals in 2013 was 50 days. With this delay period, the indicator reflecting additional delays in the start of the notice period for collective dismissals had the value of 3. Owing to this change, the summary EPRC index dropped from 2.9 to 2.7. Other implemented amendments to the LA had no effect on the EPRC index.

**TABLE 3**

*Subindex of employment protection for regular contracts (EPR) and subindex for employment protection against collective dismissals (EPC) for Croatia and comparable countries, 2008 and 2013*

	<b>EPR 2008</b>	<b>EPR 2013</b>	<b>EPC 2008</b>	<b>EPC 2013</b>
Austria	2.12	2.12	3.25	3.25
Czech R.	3.00	2.87	2.13	2.13
Estonia	2.56	1.74	1.75	2.88
Croatia	2.55	2.55	3.75	3.00
Italy	2.60	2.41	4.13	3.75
Latvia	–	2.57	–	3.75
Hungary	1.82	1.45	3.38	3.63
Germany	2.72	2.72	3.63	3.63
Poland	2.20	2.20	2.88	2.88
Slovakia	2.19	1.81	3.75	3.38
Slovenia	2.43	1.99	3.38	3.38
OECD	2.15	2.04	2.90	2.91
SIE+3*	2.42	2.22	3.20	3.22

\* For the explanation of SIE+3, see footnote below chart 1.

Sources: OECD (2013c) and author's estimate for Croatia.

<sup>10</sup> According to the OECD methodology, the delay in the start of the notice period for regular employment contracts is 6 days, if it is necessary to, give a written warning prior to the employee prior to the dismissal, in the case of dismissal on grounds of employee conduct. An additional delay of 3 days is granted if the notice of dismissal must be in writing. According to the LA, prior to a regular dismissal on grounds of employee conduct, the employer is obliged to warn the employee in writing of a possibility of dismissal. The notice of dismissal must be in a written form and it must include a written statement of reasons. The workers' council must be notified of the intention to dismiss an employee.

Slovakia, Hungary, Czech Republic, Estonia, Italy and Slovenia also increased the flexibility of their employment protection regulations for regular contracts, including collective dismissals in the said period, so that the average EPRC index for these countries stood at 2.5 in 2013 (2.3 for OECD countries). The relative position of Croatia with respect to the EPRC value remained the same as in 2008. The reforming economies have addressed all areas of law governing regular contracts, facilitating the dismissal procedures, reducing notice periods and severance payments, but also redefining the terminology related to unfair dismissals.

Since the EPRC index comprises the overall legal framework governing rights and obligations arising from regular contracts and those related to collective dismissals, the subindex of employment protection for regular contracts (EPR) and the subindex of employment protection against collective dismissals (EPC) can be analysed separately. This analysis shows a marked deterioration in the relative position of Croatia according to the EPR index in 2013 relative to 2008.

By separating the EPRC index into two subindexes (EPR and EPC), we find that through a recent reform, Croatia reduced the subindex of employment protection against collective dismissals from 3.75 in 2008 to 3.0 in 2013. The selected countries' average was 3.2 and was not significantly changed (see table 3). In contrast to the reforms of employment protection for regular contracts in Slovakia, Hungary, Czech Republic, Estonia, Italy and Slovenia which have made this area of labour legislation more flexible, the reforms of legislation governing collective dismissals in Czech Republic, Slovenia, Estonia and Hungary have not brought any changes in collective dismissals. Moreover, collective dismissals in Estonia and Hungary have become relatively more inflexible as compared to regular terminations of employment contracts. Besides in Croatia, collective dismissals became more flexible only in Italy and Slovakia. It is evident that collective dismissal regulations remained relative inflexible in all the countries, suggesting that there is a consensus that collective dismissals should be regulated more strictly, since mass redundancies can have extremely negative effects on community welfare (OECD, 2013:86).

The subindex of employment protection for regular contracts for Croatia stood at 2.55 in 2008 and remained at that level in 2013, given that the 2013 reform brought no changes regarding regular contracts. The labour legislation reforms in most of the selected countries were mainly targeted at this area, and consisted primarily in facilitating hiring and dismissal procedures (Estonia, Slovenia and Hungary), as well as in significant shortening of notice periods and reductions in severance pays (Slovenia, Slovakia, Estonia and Czech Republic). As a result, the subindex of employment protection for regular contracts for selected countries dropped from 2.4 in 2008 to 2.2 in early 2013, while the early-2013 average for OECD countries stood at 2.0.

TABLE 4

*Details of the calculation of EPC index for Croatia, based on the analysed amendments to the LA*

	Weights of individual indicators in total EPC index (in %)	2008			2013		
		Value pursuant to the LA (OG 149/09)	Contribution to total EPC index	Share in total EPC index (in %)	Value according to the LA (OG 73/13)	Contribution to total EPC index	Share in total EPC index (in %)
Index of Employment Protection against collective dismissals (EPC)	100		3.75	100		3.00	100
Definition of collective dismissal	25	3	0.75	20	3	0.75	25
Additional notification requirements	25	3	0.75	20	3	0.75	25
Additional delays involved before notice can start	25	6	1.50	40	3	0.75	25
Other special costs to employers	25	3	0.75	20	3	0.75	25

*Source: Author's estimates.*

Slovenia, for example, reformed its Labour Act (Zakon o delovnih razmerjih), with a view to increase flexibility. Employee dismissal procedures were streamlined, notice periods were shortened and severance pays in the case of unfair dismissal were cut. Estonia also reduced notice periods and severance pays and facilitated hiring and dismissal procedures. Moreover, Estonia made considerable changes in the "possibility of reinstatement following unfair dismissal" procedure. Consequently, the reinstatement of an employee in the case of unfair dismissal is now subject to mutual consent of both the employer and employee (before the reform, the employee's reinstatement was subject to a court ruling).

Despite the reform, Croatia's employment protection legislation on regular contracts still deviates sharply from the observed countries' average. Therefore, we will analyse in detail which indicators of the EPR index contribute to its high value.

TABLE 5

*Details of the calculation of EPR index for Croatia, based on the analysed amendments to the LA*

	Weights of individual indicators in total EPR index (in %)	2008			2013		
		Value pursuant to the LA (OG 149/09)	Contribution to total EPR index	Share in total EPR index (in %)	Value according to the LA (OG 73/13)	Contribution to total EPR index	Share in total EPR index (in %)
Index of Employment Protection for regular contracts (EPR)	100		2.55	100		2.55	100
Notification procedures	17	4	0.67	26	4	0.67	26
Delay involved before notice can start	17	1	0.17	7	1	0.17	7
Notice period after 9 months tenure	5	2	0.10	4	2	0.10	4
Notice period after 4 years tenure	5	3	0.14	6	3	0.14	6
Notice period after 20 years tenure	5	2	0.10	4	2	0.10	4
Severance pay after 9 months tenure	6	0	0.00	0	0	0.00	0
Severance pay after 4 years tenure	6	3	0.19	7	3	0.19	7
Severance pay after 20 years tenure	6	2	0.13	5	2	0.13	5
Definition of justified or unfair dismissal	7	4	0.27	10	4	0.27	10
Length of trial period	7	3	0.20	8	3	0.20	8
Compensation following unfair dismissal	7	3	0.20	8	3	0.20	8
Possibility of reinstatement following unfair dismissal	7	4	0.27	10	4	0.27	10
Maximum time to make a claim of unfair dismissal	7	2	0.13	5	2	0.13	5

*Source: Author's estimates.*

A detailed analysis of the situation in Croatia shows that the indicator measuring the notification procedures in the case of regular dismissal, accounts for 26% of the total value of EPR subindex in 2013. According to the OECD methodology,

the notification procedures where it is sufficient that the employer orally communicates his/her decision on dismissal to the employee are scored as the most flexible (the score of 0). Where the employer is required to hand to an employee a dismissal with the statement of reasons in a written form, the indicator takes on the value of 2, and where it is required that the dismissal should be notified by the employer not only to the employee but also to a third party (e.g. the workers' council), the indicator takes on the value of 4. The notification procedures where the employer must obtain permission from a third person to make the dismissal valid are rated as the most inflexible (rating 6). According to the LA (OG 73/13), the notice of dismissal must be delivered to the employee in writing (Article 112), and the intention to cancel an employment contract must be notified to the workers' council (if any). The employer is required to consult with the council about the decision (Article 118). As a result of the above mentioned legal procedures, this indicator for Croatia took on the value of 4 in 2013.

Moreover, the indicator measuring flexibility in the definition of justified or unfair dismissal accounted for 10% of the total value of EPR subindex in 2013. If an employee's competence (dismissal on personal grounds) or the cessation of the need for certain jobs (dismissal on business grounds) are sufficient reasons for the termination of a regular employment contract, the index takes on the value of 0. It takes on the value of 2 if the termination of an employment contract requires from an employer to take into account the employee's age and length of service. The indicator is scored as 4 if an employment contract cannot be terminated before the employee is retrained and reassigned to another job, and the indicator stands at 6 if the law does not provide for dismissal on grounds of an employee's (in)competence. According to Article 107 of the LA (OG 73/13), dismissals on personal and business grounds are permitted only where the employer cannot reassign the employee to another job (retrain him/her for another job). When deciding on such dismissals, the employer must take into account the length of service, age, disability and maintenance obligations of the employee. As a result of this, the indicator took on the value of 4 in 2013.

While dismissals on personal and business grounds are allowed in Croatia only in the above mentioned cases, in Czech Republic, Estonia, Poland, Slovakia and Slovenia, a dismissal is considered as unfair only if it results from the discriminatory treatment of employees (discrimination based on religion, ethnicity, trade union membership, etc.).

The indicator measuring the incidence of court rulings ordering the reinstatement of dismissed employees accounts for another 10% of the total EPR subindex value. This indicator takes on value 4, as in Biondić et al. (2002), Matković and Biondić (2003) and Tonin (2009). (The score of 0 is given to the labour legislation under which courts are not inclined to cancel a dismissal and reinstate an employee to his/her former job, and the score of 6 to the legislation where such court

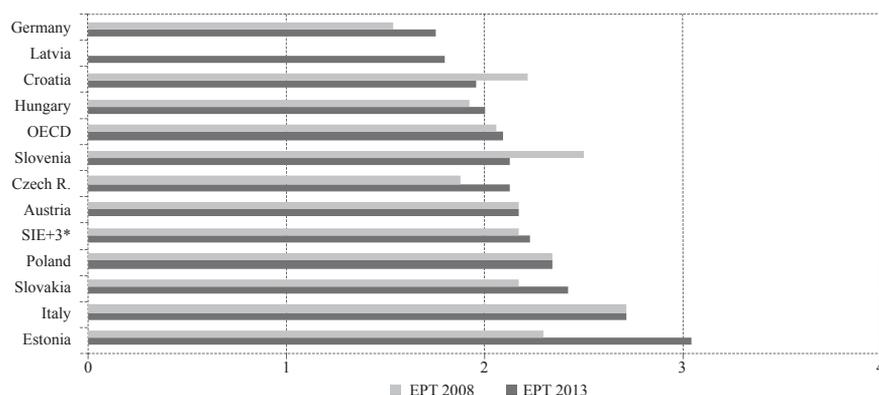
rulings are exceptionally frequent.)<sup>11</sup> The more frequent the reinstatement of dismissed employees and cancelling of dismissals by courts, the higher the value of this indicator. Nevertheless, the amendments to the LA have no direct influence on this indicator, at least unless the judicial authority to reinstate employees to their former positions is abolished. In Estonia, for example, the reinstatement of an employee is subject to a mutual agreement between the employee and employer, but this is the only country among analyzed countries providing for such an option. In all other countries, the competent court may adjudicate that an employee should be reinstated in the case of unfair dismissal. The above mentioned three indicators together account for one third of the EPR subindex value, which leads to the conclusion that complex dismissal procedures and a broad interpretation of unfair dismissals are the sources of inflexibility of regular employment legislation in Croatia compared to other countries.

#### 4 CHANGES IN EMPLOYMENT PROTECTION FOR TEMPORARY CONTRACTS

In 2008, employment protection for temporary contracts in Croatia was around the average for comparable countries. The EPT index for Croatia and comparable countries was 2.2 (2.1 for OECD countries).

##### CHART 2

*Summary Index of Employment Protection for temporary contracts for Croatia and comparable countries, 2008 and 2013*



\* For the explanation of SIE+3, see footnote below chart 1.

Sources: OECD (2013c) and author's estimate for Croatia.

<sup>11</sup> Biondić, Crnić and Martinis (2002) indicate that the score assigned to Croatia is in line with the transition countries' average. A new assessment of this indicator is currently impossible, due to unavailability of public data on court judgements in labour disputes. As an approximate indicator, annual reports on the work of the State Attorney's Office of the Republic of Croatia (DORH) in the period from 2006 to 2012 have been analysed, showing that labour disputes decided in favour of employees account for 2/3 of total labour disputes involving the DORH, which is in line with the score assigned to Croatia. This analysis is incomplete, because it leaves out judgements in private sector disputes, and because it relates to all labour disputes, regardless of their types, but, due to a lack of other data, it is the only one possible.

The indicator measuring validity of the use of fixed term contracts accounts for the bulk of the value of this summary index for Croatia (45%). According to the LA (OG 149/09), an employment contract could be concluded for a definite period of time only in exceptional cases, when the end of employment relationship has been pre-determined for objective reasons, such as the meeting of a specific deadline, completion of a task or occurrence of a specific event (Article 10). According to the OECD methodology, fixed term contracts that are valid only if used for “objective reasons” are scored as the most inflexible (the score of 6). Where such contracts additionally involve exceptions on the part of either the employer or the employee which are allowed for concluding a fixed term contract, then the relevant indicator is assigned the score of 4, and where exceptions are allowed simultaneously for both the employer and employee, the score is 2. Where there are no legal constraints on the conclusion of fixed term contracts, the indicator takes on the value of 0. Given that the Croatian LA provided for conclusion of fixed term contracts where this was justified by objective reasons, with an explicit exception for employees (first employment, employment of a probationer or trainee), regulated by Article 37, paragraph (3) of the LA, this indicator for Croatia was assigned the score of 4.<sup>12</sup>

As a result of amendments to the LA from July 2013 (OG 73/13) relating to fixed term contracts, EPT index dropped from 2.2 in 2008 to 2.0 in 2013. This change was due to a reform of Article 10 on fixed-term employment. The first use of fixed term contracts was no more subject to time limits. However, in order to protect employees’ rights, in the case of successive fixed term contracts, the maximum duration of contracts remained limited to three years. Moreover, restrictions with respect to reasons for the conclusion of the first fixed term contract were lifted, whereas the possibility of concluding successive fixed term contracts was only allowed if the employer had objective reasons for that which he had to clearly state in writing. Austria and Hungary also have no restrictions as to the objectivity of reasons for the first use of fixed term contracts (although this restriction does exist for each subsequent fixed term contract). Therefore, according to OECD re-

<sup>12</sup> It is noteworthy that this indicator for Croatia is scored as 6 in Tonin (2009), but it is assigned the score of 4 in Matković and Biondić (2003). Moreover, during consultations with legal experts, opposing opinions were expressed, so that the value of this indicator, according to some interpretations, might be higher than 4. The effective assessment regarding fixed term contracts should be interpreted with caution, because, according to the OECD methodology, the weight assigned to this indicator is the highest, i.e. its value is the most significant for the assessment of the total EPT index (the weight makes up 25% of the index). Equally ambiguous is the interpretation of the question regarding the maximum duration of employment via temporary work agencies. Specifically, an assessment is made of the allowed maximum cumulative duration of employment through temporary work agencies. According to the LA, there is no limit in this respect, but there is a one-year limit on the allowed maximum cumulative duration of successive contracts. However, the term successive is not specified in the OECD methodology. In earlier studies by Matković and Biondić (2003) and Tonin (2009), this indicator was assigned the score of 4, although Tonin (2009) notes that the required period of break after one year of employment through an agency (one month) can be considered as a relatively non-rigid limit imposed by legislators. Given that the weight assigned to this indicator is 8%, this question is not crucial for the assessment of the EPT index.

commendations, after the amendments to the LA, this indicator was assigned the score of 1.<sup>13</sup>

**TABLE 6**

*Details of the calculation of EPT index for Croatia, based on the analysed amendments to the LA*

	Weights of individual indicators in total EPR index (in %)	2008			2013		
		Value pursuant to the LA (OG 149/09)	Contribution to total EPT index	Share in total EPT index (in %)	Value according to the LA (OG 73/13)	Contribution to total EPT index	Share in total EPT index (in %)
Index of Employment Protection for temporary contracts (EPT)	100		2.21	100	1.96	100	
<i>Fixed term contracts</i>							
Valid cases for use of fixed-term contracts (FTC)	25	4	1.00	45	1	0.25	13
Maximum number of successive FTC	13	0	0.00	0	4	0.50	26
Maximum cumulated duration of successive FTC	13	1	0.13	6	1	0.13	6
<i>Temporary work agencies</i>							
Types of work for which temporary work agency (TWA) employment is legal	17	1.5	0.25	11	1.5	0.25	13
Restrictions on number of renewals	8	2	0.17	8	2	0.17	9
Maximum cumulated duration of TWA assignments	8	0	0.00	0	0	0.00	0
Does the set-up of a TWA require authorisation or reporting obligations?	8	2	0.17	8	2	0.17	9
Do regulations ensure equal treatment of regular and agency workers at the user firm?	8	6	0.50	23	6	0.50	26

*Source: Author's estimates.*

<sup>13</sup>For more details on the regulation of fixed term contracts in Austria and Hungary, see OECD (2013b).

In 2013, the indicator measuring the maximum number of successive fixed term contracts took on the value of 4 (0 before the reform). To be more specific, although the Croatian legislation does not envisage any maximum number of successive fixed term contracts, according to the amended Article 10, an extension of the first temporary contract is only allowed if there are objective reasons for that. In addition, where the first employment contract is concluded for a period of more than 3 years, the employer cannot conclude the next consecutive fixed term contract with the same employee (Article 10, paragraphs (2) and (4)). Based on a comparison with Austria and Hungary which apply similar solutions in the case of successive fixed term contracts, this indicator is assigned the score of 4.

Thanks to the reform of Article 10, this issue was brought into line with the EU practice, where the use of fixed term contracts is not conditioned by objective reasons, which makes it easier for employers to hire employees. However, in order to protect the rights of employees, such contracts are restricted by the maximum duration or maximum number of successive contracts.

In contrast to Croatia and Slovenia which reported falls in their EPT indexes, the value of the index increased in Estonia, Hungary, Slovakia, Czech Republic and Germany, so that the average for selected countries stood at 2.2 in 2013. The growth in this index was primarily due to the harmonisation of the temporary work agencies' regulations with the applicable EU directives. However, through the flexibilisation of the first use of fixed term contracts, Croatian legislation became more convergent with that of Austria, Czech Republic, Germany, Hungary, Poland and Slovakia which impose no "objective reasons" constraints on the use of fixed term contracts.

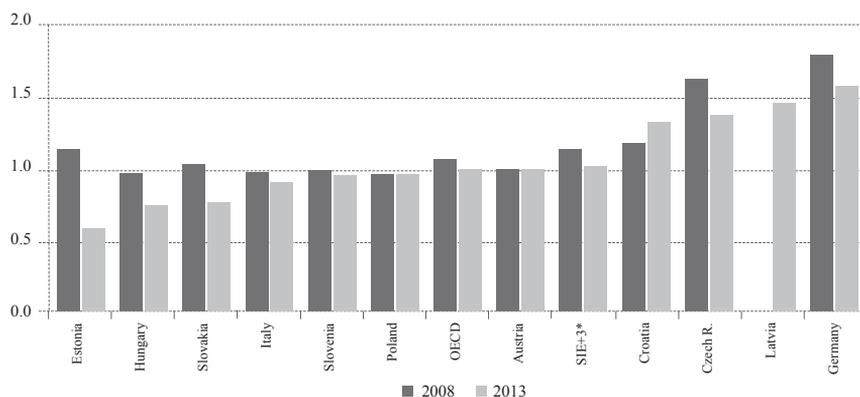
Another indicator having a significant influence on the value of the summary EPT index for Croatia in 2013 was the one relating to the regulation of temporary work agencies. This indicator measures equality of pay and other work conditions between persons employed through temporary work agencies and other workers performing the same jobs. According to the OECD methodology, where there is no legal obligation to give the temporary work agency employees the same treatment as that given to other employees the indicator takes on the value of 0. Where the law prescribes equality with respect to pay or other work conditions, the indicator is scored as 3. Where it prescribes equality of pay and other work conditions, the score is 6. According to the LA (OG 73/13), the contracted salary and other work conditions for assigned workers in Croatia may not be lower or less favourable, than the pay and other work conditions for workers employed with the user at the same jobs (Article 26). However, as shown by a cross-country comparison, similar regulations were in force in most of the CEE countries, as well as in most OECD member countries. Hence, this indicator had the maximum value for as many as 23 countries in 2013. This is not surprising, given that all the

EU Member States should define their respective temporary work agency legislation by applying the EU Temporary Agency Work Directive.<sup>14</sup>

A detailed analysis of employment protection legislation for regular and temporary contracts (on the basis of EPR and EPT indexes) shows that inequality of protection between the two types of employment became even more pronounced after the adoption of amendments to the Croatian LA. The 2013 EPR index remained unchanged from 2008 (2.55), while the EPT index declined, from 2.2 in 2008 to 2.0 in 2013.

### CHART 3

*Ratio between EPR and EPT indexes for Croatia and selected countries, 2008 and 2013*



\* For the explanation of SIE+3, see footnote below chart 1.

Sources: OECD (2013c) and author's estimate for Croatia.

In all other reforming countries, the difference in employment protection between the two types of contract has been reduced (chart 3), mainly through flexibilisation of regular (permanent) contracts. Consequently, increasing the flexibility of regular employment and reducing inequalities in employment protection between different types of employment remain as challenges for the second phase of the LA reform, announced for 2014.

At this point, it should be noted that a comparison between the EPRC and OECD EPT indexes makes it possible to analyse formal rigidity of the labour market, but not the effective one, which may depend on many factors, some of which are not determined by law. Thus, for example, regardless of the labour legislation, labour market rigidity largely depends on how this legislation is implemented by the competent institutions, since the rigidity of implementation may vary considera-

<sup>14</sup> European Commission Directive (104/2008/EC).

bly from country to country. Moreover, many aspects of the labour market regulation remain outside the scope of the analysed indexes, e.g. the regulation of working hours which influences the flexibility of working time organisation, or the manner of conclusion and implementation of collective agreements, representing the main determinant of labour market rigidity in the peripheral countries of the eurozone. In this respect, the LA reform in 2013 led to reduction of minimum uninterrupted daily rest period from ten to eight hours, in order to better organise the work in agriculture, tourism and catering which, require split shift working time due to their specific nature. This change increased the flexibility of operation of enterprises, but is not reflected in the OECD indexes. Also, as a result of the Act on Amendments to the Act on Mediation in Employment and Rights during Unemployment (OG 153/13) passed in December 2013 the rights during unemployment of persons employed in crafts, trades and free lancers, and private farmers became equal to those of employees with legal entities, which is again not shown in the OECD indexes. Hence, it is important to note that, due to their format, the OECD indexes provide only a general picture of labour market flexibility which also has some drawbacks. In addition, even those labour legislation aspects that are included in the index are not fully comparable. In Croatia, for example, the determinants of flexibility in the definition of unfair dismissal (priority rules for redundancies and the obligation to retrain or reassign an employee to another job) apply only if the employer has more than 20 employees. The structure of the OECD index is inappropriate to distinguish between the uses of these rules depending on the size of an enterprise. However, the effects on the labour market will not be the same if enterprises with 5, 10, 20, 50 or 200 employees are excluded. Therefore, absolute and uncritical interpretations of the EPRC and EPT indexes should be avoided.

### 5 EASE OF EMPLOYMENT INDEX

Another labour market flexibility indicator which is much wider in scope than the EPL index, and, given the availability of the data, can be estimated for most countries in the world, is the World Bank's Ease of Employment Index. Unlike the OECD indexes, this one measures strictness of a country's legislation related to working hours, but it does not analyse collective dismissals or the operation of temporary work agencies. Furthermore, the World Bank methodology assumes that an "average worker" representing a country earns an average wage, that his/her religion and race are the average religion and race in the analysed country, that he/she works in the largest city in the country, in a manufacturing company with 60 employees which is exclusively in domestic ownership, and that he/she is not a member of any trade union.<sup>15</sup> In view of all this, as well as the fact that manufacturing in Croatia accounted for 15.6% of gross value added in 2013, it is evident that these assumptions undermine the representativeness of employees in the economy. Hence, despite being based on a considerably larger sample of countries,

<sup>15</sup> For more details, see World Bank (2012).

which makes it more valuable than the OECD indexes, this index gives only a partial picture of labour market flexibility.

The Ease of Employment Index has been originally intended for measuring employer costs arising from labour legislation, whereas the utility of an employee arising from the employment protection legislation was neglected. Due to widespread criticism of this approach, the World Bank set up a working group to include a minimum level of workers' rights in the calculation of the index, in line with ILO standards. After the inclusion of a minimum level of workers' rights, if a country's labour legislation is too flexible to the detriment of workers, the country will be assigned unfavorable score. For example, a country's score will be lower if its labour legislation provides for an annual leave of less than 15 days, while countries the legislation of which does not provide for at least 1 day of weekly rest will be scored unfavourably for such over-flexibility. If a country's legislation does not provide for a minimum wage, the country cannot be assigned the best score on the indicator measuring the ratio of the minimum wage to the value added per employee, etc.<sup>16</sup>

Despite the efforts to improve the index, the World Bank has not published the Employment Protection Legislation Index on its Internet site since 2011, but has published the data base pertaining to it, so that the index can be estimated. However, all the results obtained by the estimation of this index must be taken with extreme caution.<sup>17</sup> Having in mind the above mentioned shortcomings of this index, but also the extreme popularity of all the Doing Business indexes, below follows a brief analysis of the Ease of Employment Index.<sup>18</sup> The data are taken from the World Bank and there is no detailed analysis of individual legal provisions, but only a commentary on the final results.

The Ease of Employment Index is calculated on the basis of two main indicators: the Rigidity of Employment Index and Firing Costs Index, where the Employment Rigidity Index is the average of three subindexes: the Difficulty of Hiring Index, Rigidity of Hours Index and Difficulty of Redundancy Index. Each of the subindexes contains several components which are scored in accordance with the World Bank methodology, regardless of the characteristics of a given labour legislation. The components of the World Bank's Ease of Employment Index are presented in table 7.

<sup>16</sup> For further information, see the World Bank Group (2013).

<sup>17</sup> Moreover, in view of the previously mentioned non-publishing of the EPL index, another criticism of the Ease of Employment Index may be that its aggregate form does not allow to distinguish between the labour legislation providing only marginal flexibility from that where employment protection is equal for both regular and temporary forms of employment.

<sup>18</sup> World Bank (2013).

TABLE 7

## Components of the World Bank's Ease of Employment Index

Ease of Employment Index	1.1 Difficulty of hiring	a) Fixed-term contracts prohibited for permanent tasks
		b) Maximum length of fixed-term contracts, including renewals (months)
		c) Ratio of minimum wage to value added per worker <sup>a</sup>
	1.2 Rigidity of hours	a) Are there restrictions on night work?
		b) Are there restrictions on weekly holiday work?
		c) Can the workweek consist of 5.5 days or can it consist of more than 6 days?
		d) Can the workweek extend to 50 or more hours (including overtime)?
		e) Is the average paid annual leave for a worker with 1 year of tenure, a worker with 5 years and a worker with 10 years more than 26 working days or fewer than 15 working days?
	1. Rigidity of Employment Index	a) Is redundancy allowed as a basis for terminating workers?
		b) Should an employer notify a third party (such as a government agency) to terminate one redundant employee?
	1.3 Difficulty of redundancy	c) Does an employer need approval from a third party to terminate 1 redundant employee?
		d) Should an employer notify a third party to terminate 9 redundant employees?
		e) Does an employer need approval from a third party to terminate 9 redundant employees?
f) Does the law require the employer to reassign or retrain an employee before making the employee redundant?		
g) Do priority rules apply for redundancies? <sup>b</sup>		
h) Do priority rules apply for reemployment?		
2. Firing costs	The cost of the notice period, severance pay and penalties due when terminating a redundant employee, expressed in weeks of salary	

<sup>a</sup> The average value added per employee is the ratio of an economy's gross national income (GNI) per capita to the working-age population as a percentage of the total population. The idea is to highlight the labour costs borne by employers.

<sup>b</sup> For example, employees with the longest tenure will be the last dismissed.

Sources: World Bank (2014). The assessment methodology for individual indicators can be found in World Bank (2012).

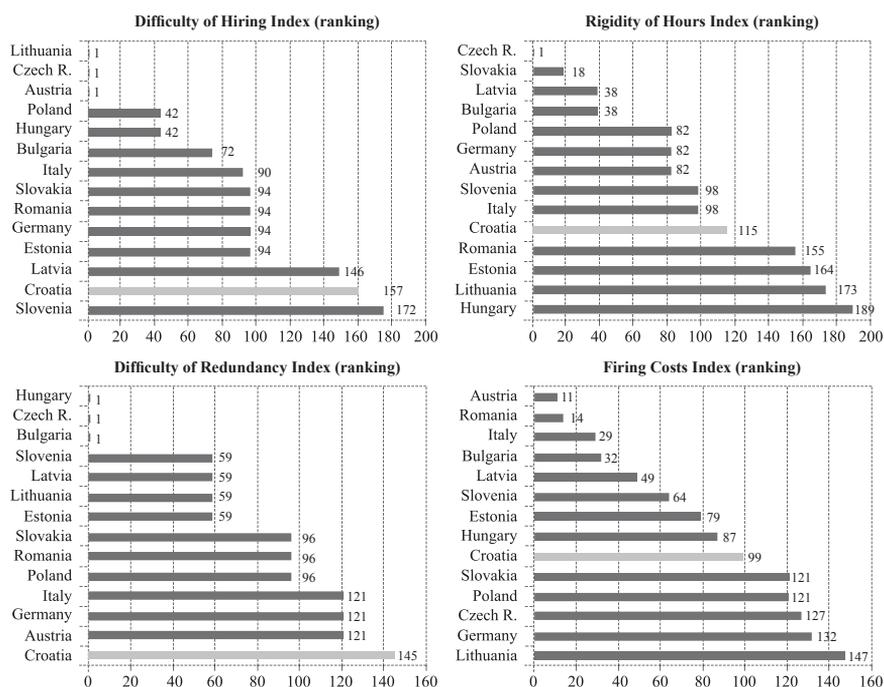
The World Bank data suggest that Croatia's labour market is rigid in comparison with the markets of other countries included in the analysis. It has been estimated that Croatia is rated the worst compared to peer countries and main trading partners (chart 4) holding the 161<sup>st</sup> position among 189 observed countries.

Compared with peer countries, Croatia ranks the worst according to the Difficulty of Redundancy Index (dismissing one or more workers). This is due to the fact that Croatia has the largest number of restrictions on redundancy dismissals. Thus,

for example, a third party (workers' council) must be notified of the intended dismissal of a redundant employee, the employer is required to reassign to or retrain a worker for another job before making the worker redundant, and priority rules for redundancies apply (depending on the worker's length of service, age, disability and maintenance obligations), and for reemployment (in the case of a dismissal on business grounds, the employer is obliged to offer the dismissed employee a new employment contract where a need for reemployment at the same job occurs in the next six months from the dismissal).

#### CHART 4

##### *Components of the Ease of Employment Index (ranking), early 2013*



A country's ranking is obtained by calculating the averages of indicators relevant to a particular index (see table 7) which are then used to assess the position of each country in the group of countries as a percentage of the total value for the group. Then a list of countries by rankings (from 0 to 189) is compiled. The ranking of 0 represents extremely flexible and the ranking of 189 extremely rigid labour legislation. The World Bank data for Croatia are shown in annex, table A2. The assessment methodology for individual indicators is presented in World Bank (2012).

Source: World Bank (2014).

Croatia holds the second-last position among the observed countries in terms of the Difficulty of Hiring Index. Specifically, at the beginning of 2013, only in Croatia, Slovenia, Romania, Estonia and Latvia fixed-term employees were prohibited from performing permanent tasks. The maximum cumulative duration of fixed-term contracts was shorter than in Romania, Czech Republic, Hungary, Au-

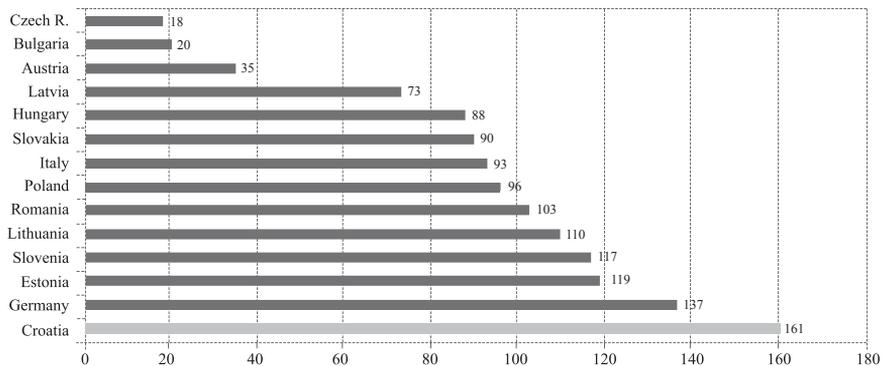
stria, Italy, Poland, Lithuania and Estonia, and the ratio of the minimum wage to the average value added per employee was higher than in all the observed countries except Slovenia and Italy. Although not significantly higher, this ratio ranks Croatia among lower-rated countries.

Redundancy costs (average notice period and severance pays for workers with 1.5, 5 and 10 years of tenure) are lower in Croatia (15 average week salaries) than in Slovakia, Poland, Czech Republic, Germany and Lithuania, but considerably higher than the averages for Austria and Romania (2 and 4 week salaries respectively).

The relative rigidity of Croatian labour legislation in comparison with peer countries is also reflected in the Rigidity of Hours Index: according to the World Bank, there are restrictions on night and weekly holiday work (in the case of continuous work) in Croatia. Among the observed countries, only Estonia, Hungary, Lithuania and Romania rank worse than Croatia on this indicator.

### CHART 5

#### *Ease of Employment Index (ranking), early 2013*



*See explanation below chart 4.*

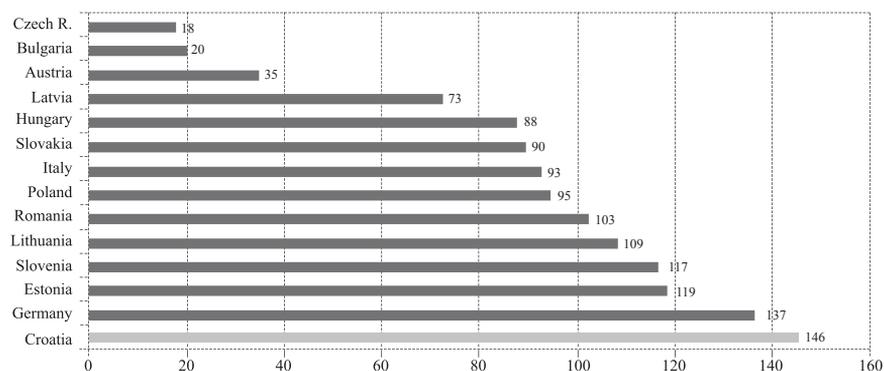
*Source: World Bank (2014).*

Given that the World Bank's database has been created in early 2013, it does not take account of the previously mentioned amendments to the LA. In the following, we therefore examine how these amendments were reflected in the Ease of Employment Index. In view of the design of implemented reforms and the construction of the World Bank indexes, only the flexibilisation of the use of fixed-term contracts, as the consequence of the LA amendments, affected the World Bank's Ease of Employment Index. Other changes in the LA related to areas not relevant to this index (such as the regulation of collective agreements).

Comparing the data for Croatia with Austria and Hungary, regarding the question: Are fixed-term employees prohibited from performing permanent tasks? showed that recorded answer in World Bank data set is “no”, even though such persons are allowed to perform permanent tasks but only under the first contract, as is the case in Croatia after the adoption of Amendments to the LA. We therefore analyse the extent of change in the Ease of Employment Index as a result of this legislative change. However, we only make a direct assessment without including some indirect effects. Thus, for example, an improvement in the index, resulting from a potentially more flexible application of fixed-term contracts may be partly offset, if their share in total employment increases due to the flexibility of this type of contracts, which may lead to a decline in productivity in the economy and, consequently, to a rise in the Difficulty of Hiring and Ease of Employment Indexes. Taking into account only the direct effects, we estimate that, after the amendments to the LA, Croatia moved to the 146<sup>th</sup> position in terms of the Ease of Employment Index. It should be borne in mind, of course, that the new ranking for Croatia assumed that no labour legislation reforms took place in other countries in 2013. If some other countries also flexibilised their labour legislation, the relative improvement in Croatia’s ranking would be smaller. Other changes in the LA, implemented in the first phase of the reform had no effect on the Ease of Employment Index, because this index, unlike the OECD indexes, does not cover collective dismissals.

## CHART 6

### *Ease of Employment Index after Amendments to the Labour Act (OG 73/13)*



*The ranking of 0 represents extremely flexible and the ranking of 189 extremely rigid labour legislation.*

*Sources: World Bank (2014) and author’s estimate for Croatia related to the indicator measuring “Whether fixed-term employees are prohibited from performing permanent tasks”.*

However, even after the adoption of Amendments to the Labour Act, ranking according to the Ease of Employment Index for Croatia remained relatively high (146). The continuously poor performance of the index is even more obvious if

compared with countries in the region. In early 2013, Macedonia, Montenegro, Serbia and Bosnia and Herzegovina ranked 31<sup>st</sup>, 61<sup>st</sup>, 71<sup>st</sup> and 81<sup>st</sup> on the list respectively.<sup>19</sup> Before the LA reform, only Serbia had a lower ranking in terms of the Difficulty of Hiring Index (172) than Croatia (157). After the reform, Croatia's ranking was upgraded to 90 (assuming the absence of reforms in the rest of the countries during the same period), and the country currently ranks more favourably than both Bosnia and Herzegovina (151<sup>th</sup>) and Montenegro (125<sup>th</sup>); while Macedonia ranks 1<sup>st</sup>. As concerns other subindexes, Croatia lags noticeably behind countries in the region. Thus, it ranks 115<sup>th</sup> on the Rigidity of Hours Index, while Macedonia ranks the worst (98<sup>th</sup>) among other countries in the region. According to the Difficulty of Redundancy Index, Croatia again ranks the worst among countries in the region (145<sup>th</sup>), followed by Bosnia and Herzegovina (96<sup>th</sup>). Croatia's ranking on the Cost of Redundancies Index is also the most unfavourable (99), slightly more unfavourable than that of Macedonia (81). Interestingly, Macedonia belongs to the world's most flexible countries in terms of difficulty of hiring and redundancy. In 2010, this country reformed these procedures and in addition it increased the possibility of using fixed-term contracts. However, it is difficult to assess the labour market effects of these radical reforms in an economy with a pre-crisis unemployment rate amounting to 35%. Nevertheless, the unemployment rate did not go up further and stood at 31% at end-2012. For details of the Ease of Employment Index for all the EU member States and countries in the region, see table A3.

## 6 CONCLUSIONS

After the implementation of amendments to the LA, Croatia's employment protection legislation converged with that in peer countries and trading partners. As there was no significant further relaxation of employment protection for fixed-term contracts in the analyzed countries, the flexibilisation of Croatia's LA through expanding the valid use of fixed-term contracts has put the country closer to the already existing practices in the analyzed countries. On the other hand, the flexibilisation of employment protection legislation for regular contracts, including collective dismissals took place in almost all the observed countries. In Croatia, however, except for the flexibilisation of employment protection legislation for collective dismissals, nothing was done to adjust the employment protection legislation for regular contracts. Therefore, some of the hiring and dismissal procedures remain more complex in this country than in the observed countries. Moreover, as the reform failed to increase the flexibility of employment protection for regular contracts, it deepened the inequality of protection between different types of employment in Croatia.

<sup>19</sup> In contrast to the OECD which analyses labour market rigidity only for the selected countries, the World Bank compiles the Ease of Employment Indexes for 189 countries, which allows a comparison with countries in the region.

Additional changes, to be introduced during 2014, are likely to bring further liberalisation of the Croatian labour market and, consequently, more flexible employment protection legislation for regular contracts. As this article only deals with formal measures of labour market flexibility, it is worthy of note that the final labour market outcomes may be markedly different, especially in countries with high levels of grey economy and in times of economic crisis. Therefore, the effects of inflexible labour legislation on labour market outcomes remain a challenge for future research.

TABLE A1

*EPRC and EPT indexes as sources for assessing employment protection legislation pursuant to the Labour Act*

**Index of Employment Protection for regular contracts, including collective dismissals (EPRC)**

**Index of Employment Protection for regular contracts (EPR)**

Notification procedures	Articles 112 and 118
Delay involved before notice can start	Articles 111, 112 and 118
Notice period after 9 months tenure	Article 114, paragraph (1)
Notice period after 4 years tenure	Article 114, paragraph (5)
Notice period after 20 years tenure	Article 114, paragraph (6)
Severance pay after 9 months tenure	Article 119
Severance pay after 4 years tenure	Article 119
Severance pay after 20 years tenure	Article 119
Definition of justified or unfair dismissal	Article 107, paragraphs (2), (3), (4) and (7)
Length of trial period	Article 35
Compensation following unfair dismissal	Article 117, paragraph (1)
Possibility of reinstatement following unfair dismissal	Article 116, estimates from Biondić et al. (2002), Matković and Biondić (2003) and Tonin (2009)
Maximum time to make a claim of unfair dismissal	Article 129, paragraphs (1) and (2)

**Index of Employment Protection against collective dismissals (EPC)**

Definition of collective dismissal	Article 120, paragraph (1)
Additional notification requirements	Article 120, paragraph (2); Article 122, paragraph (1)
Additional delays involved before notice can start	Article 122, paragraphs (3) and (5) of the LA (OG 149/09); Article 122, paragraphs (3) and (5) of the LA (OG 73/13); delays in the start of the notice period for regular termination of employment contracts according to Article 111, Article 112 and Article 118, and according to the OECD methodology are assessed at 10 days
Other special costs to employers	Article 121

**Index of Employment Protection for temporary contracts (EPT)**

*Fixed term contracts*

Valid cases for use of fixed-term contracts (FTC)	Article 10 of the LA (OG 149/09); Article 10 of the LA (OG 73/13)
Maximum number of successive FTC	None for LA (OG, 149/09); Article 10, paragraphs (2) and (4) of the LA (OG 73/13)
Maximum cumulated duration of successive FTC	Article 10, paragraph (3) of the LA (OG 149/09); Article 10, paragraph (3) of the LA (OG 73/13)

*Temporary Work Agency*

Types of work for which temporary work agency (TWA) employment is legal	Article 24; Article 25, paragraph (4)
Restrictions on number of renewals	None
Maximum cumulated duration of TWA assignments	Article 28, paragraphs (1) and (2)
Does the set-up of a TWA require authorisation or reporting obligations	Article 24, paragraphs (2) and (3); and Article 32
Do regulations ensure equal treatment of regular and agency workers at the user firm?	Article 26, paragraph (5)

Source: Labour Acts (OG 149/09 and OG 73/13). The articles of the LA with no references to the specific LA are those which remained unchanged after the Amendments to the LA in June 2013.

**TABLE A2**  
*World Bank data for Croatia*

1.1 Difficulty of hiring	a) Fixed-term contracts prohibited for permanent tasks	YES – WB data, NO – simulated change in the LA (OG 73/13)
	b) Maximum length of a single fixed-term contract (months)	36 months
	c) The ratio of the minimum wage of a trainee or first-time employee to the average value added per employee	0.31
1.2 Rigidity of hours	a) Are there restrictions on night work?	YES
	b) Are there restrictions on weekly holiday work?	YES
	c) Can the workweek consist of 5.5 days or can it consist of more than 6 days?	6 days
	d) Can the work week extend to 50 or more hours (including overtime)?	YES
	e) Is the average paid annual leave for a worker with 1 year of tenure, a worker with 5 years and a worker with 10 years more than 26 working days or fewer than 15 working days?	20 days
1.3 Difficulty of redundancy	a) Is redundancy allowed as a basis for terminating workers?	YES
	b) Should an employer notify a third party (such as a government agency) to terminate one redundant employee?	YES
	c) Does an employer need approval from a third party to terminate 1 redundant employee?	NO
	d) Should an employer notify a third party to terminate 9 redundant employees?	YES
	e) Does an employer need approval from a third party to terminate 9 redundant employees?	NO
	f) Does the law require the employer to reassign or retrain an employee before making the employee redundant?	YES
	g) Do priority rules apply for redundancies?	YES
	h) Do priority rules apply for reemployment?	YES
The cost of the notice period, severance pay and penalties due when terminating a redundant employee, expressed in weeks of salary		7.9 weeks (notice period)
		7.2 weeks (severance pay)

Source: World Bank (2014).

TABLE A3

*Components of the Ease of Employment Index (rankings) for EU and countries in the region*

	Difficulty of Hiring (ranking)	Rigidity of Hours (ranking)	Difficulty of Redundancy (ranking)	Redundancy costs (ranking)	Ease of Employment Index (ranking)
Austria	1	82	121	11	35
Belgium	42	38	1	30	10
Bosnia and Herzegovina	151	16	96	46	81
Bulgaria	72	38	1	32	20
Croatia	90	115	145	99	146
Cyprus	94	1	121	24	48
Czech R.	1	1	1	127	18
Denmark	1	18	1	1	1
Estonia	94	164	59	79	119
Finland	125	115	145	54	141
France	160	177	121	72	167
Germany	94	82	121	132	137
Greece	94	175	96	106	151
Hungary	42	189	1	87	88
Ireland	42	1	50	74	27
Italy	90	98	121	29	93
Kosovo	1	75	96	69	50
Latvia	146	38	59	49	73
Lithuania	1	173	59	147	110
Luxembourg	172	164	96	133	178
Macedonia	1	98	1	81	31
Malta	90	82	59	31	58
Montenegro	125	16	59	67	61
Netherlands	72	115	174	37	121
Poland	42	82	96	121	96
Portugal	157	111	121	143	168
Romania	94	155	96	14	103
Serbia	172	26	59	33	71
Slovakia	94	18	96	121	90
Slovenia	172	98	59	64	117
Spain	172	82	59	118	139
Sweden	95	82	121	93	115
UK	42	38	1	36	12

*The ranking of 0 represents extremely flexible and the ranking of 189 extremely rigid labour legislation.*

*Sources: World Bank (2014) and author's estimate for Croatia related to the indicator measuring "Whether fixed-term employees are prohibited from performing permanent tasks".*

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# The power of fiscal multipliers in Croatia

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## Abstract

*This paper investigates fiscal multipliers in Croatia in the period 1996Q1-2011Q4. For this purpose, a Blanchard Perotti three variable baseline SVAR is employed as a no regime-switch model, along with a four variable baseline STVAR as a regime-switch model. Results show that during recessions fiscal multipliers in Croatia tend to be much larger and move in line with Keynesian assumptions, i.e. a positive government spending shock increases output, private consumption and private investment, while oppositely a positive tax shock worsens the same macroeconomic variables. Moreover, during recession times government spending for purchases of goods and services seems to be the most effective fiscal instrument for boosting economic activity.*

*Keywords: fiscal multiplier; spending shock; tax shock; SVAR; STVAR; Croatia*

*“Our area of ignorance even on basic signs of fiscal policy multipliers is too great.”*

*Perotti (2000:24)*

## 1 INTRODUCTION

The recent global financial crisis refocused the attention of policy makers and economists onto fiscal policy as a potentially strong tool in stimulating economic growth. Although for decades there has been a global tendency for fiscal stabilization to be performed mainly by the work of automatic stabilizers rather than discretionary fiscal policy, governments as well as institutions traditionally seen as symbols of fiscal austerity (such as the International Monetary Fund or European Commission) opted for large fiscal stimuli during the latest economic downturn.

Still, the eventual effects of a stimulus package are uncertain and empirical research shows no absolute consensus on the effects of fiscal policy on macroeconomics. Most studies prove a positive multiplier for an exogenous government spending shock and a negative multiplier for an exogenous government tax shock. Nevertheless, the size (and sign) of a fiscal multiplier is country-, time-, estimation method- and regime-dependent. A revealing example of how differences in size of a fiscal multiplier affect potential fiscal stimuli effectiveness was recently provided by Barro (2009). In an article for the Wall Street Journal Barro discusses the recovery program proposed by Cristina Romer, Chair of President Obama’s Council of Economic Advisers. Namely, when estimating the overall job gains for the proposed 787 billion USD stimulus package, Cristina Romer used 1.5 as the size of the government spending multiplier. Barro’s opinion was that the size of this multiplier was essentially zero and therefore, as pointed by Ilzetzki, Mendoza and Vegh (2010:2) “the difference between Romer’s and Barro’s views of the world amounts to a staggering 3.7 million jobs by the end of 2010”.

Diverging predictions of the effectiveness of fiscal stimuli can be found in theoretical literature as well. Real Business Cycle (RBC) models assume that an increase in government consumption will be completely neutralized by the reduction of private consumption (Baxter and King, 1993 or Fatás and Mihov, 2001). Keynesian models argue that a government consumption increase leads to an increase in private consumption and output (Blanchard, 2003)<sup>1</sup>. However, Pappa (2003:2) indicates that differences in predicting fiscal policy effects arise because fiscal shocks are difficult to identify in practice due to “endogeneity of fiscal variables, interactions between fiscal and monetary policy variables, delays between planning, approval and implementation of fiscal policies and scarceness of reasonable zero-identifying restrictions”.

This paper studies fiscal multipliers in Croatia using two different frameworks for estimation. On one hand a linear structural vector autoregression (SVAR) model as proposed by Blanchard and Perotti (2002) is used to estimate the overall sign and size of a government spending and tax shock on output, private consumption and private investment. The novelty of the SVAR model in this paper with respect to other works published in the field of fiscal policy on the Croatian case (i.e. Ravnik and Žilić, 2011; Šimović and Deskar-Škrbić, 2013) are the following: (1) the data set is based on a longer time span (1996Q1-2011Q4), (2) estimated multipliers involve not only the effect of total government spending and taxes but government spending components as well, (3) fiscal policy effects are investigated not only with respect to output, but also with respect to private consumption and private investment, and (4) multipliers are converted into monetary values (in kuna), which is much more *friendly* for readers and gives a real *feeling* of the effect.

On the other hand a smooth transition vector autoregression (STVAR) model is used to investigate whether the size of a fiscal multiplier is different in *good* and *bad* times. This analysis as well embraces the effects (multipliers) of different government spending components on output, private consumption and investment.

The main results are in line with Keynesian theory. A spending shock positively affects output, private consumption and private investment and the response is significant within a year. Moreover, when investigating the effect of government consumption versus government investment, the positive effect of the first with respect to output and private consumption is persistent and significant throughout the whole time horizon. A tax shock leads to a drop in output, private consumption and private investment. If the regime-switching models are considered, the results are conclusive in the fact that fiscal multipliers tend to be larger in times of economic downturn in Croatia than in times of expansion when they are mostly insigni-

<sup>1</sup> The disagreement about fiscal policy effects on private consumption is part of a broader topic whether consumers are set as Ricardian or non-Ricardian. In the standard neoclassical model an increase in government spending tends to crowd out private consumption due to the negative wealth effect on consumer induced by expectations of higher tax payments in future.

ficant. Such results are in line with similar research conducted in the case of other (developed and developing) countries.

This paper is structured as follows: section two gives some insight into the theoretical and empirical background about fiscal multipliers. The third section is devoted to a brief explanation of the methodologies and data used in the analysis. Section four presents the results, while the last, fifth, section is reserved for concluding remarks.

## 2 THEORETICAL AND EMPIRICAL BACKGROUND

In general, a fiscal multiplier refers to a change in output  $\Delta Y$  occurring after an exogenous one-unit change in a fiscal policy instrument  $\Delta FI$  (the fiscal instrument  $FI$  can be represented by total government spending  $G$ , total taxes  $T$  or their sub-component – transfers  $G^t$  or direct taxes  $T^d$  for instance). For example, in the case in which a one-kuna increase in government spending in Croatia causes a 50 lipa increase in GDP, then the government spending multiplier is said to be 0.5. Such a multiplicative effect varies across the time horizon, so it is important to stress the following definitions:

The **impact multiplier** measures the ratio of a contemporaneous change in output to an exogenous change in fiscal policy instrument at time of impact (occurrence of shock), i.e. time  $t_0$ :

$$\frac{\Delta Y_{t_0}}{\Delta FI_{t_0}} \quad (1)$$

The **multiplier in a future period  $n$**  is the ratio of change in output in time  $t_0+n$  to an exogenous change in the fiscal policy instrument at time of impact  $t_0$ :

$$\frac{\Delta Y_{t_0+n}}{\Delta FI_{t_0}} \quad (2)$$

The **cumulative multiplier** is defined as the cumulative change in output over the cumulative change in fiscal policy instrument at some time horizon  $n$ :

$$\frac{\sum_{i=1}^n \Delta Y_{t_0+i}}{\sum_{i=1}^n \Delta FI_{t_0+i}} \quad \text{where } i=1,2,\dots,n \quad (3)$$

The **peak multiplier** represents the largest change in output after a change in fiscal policy instrument over any time horizon  $n$ :

$$\max_n \frac{\Delta Y_{t_0+n}}{\Delta FI_{t_0}} \quad (4)$$

Empirical and theoretical studies show that fiscal multipliers vary in sign and size, being also country-, time-, methodology- and economic conditions-specific. In fact, there is no absolute consensus on the effects of fiscal policy on macroeconomics,

and empirical results agree on one fact only, i.e. *that a positive government spending shock has a positive (and significant) effect on output*<sup>2</sup>.

Additionally, Spilimbergo, Symansky and Schindler (2009:2) point out that the size of the multiplier is larger if (1) “leakages” are few (i.e. only a small part of the stimulus is saved or spent on imports), (2) monetary conditions are accommodative (i.e. the interest rate does not increase as a consequence of fiscal expansion), and (3) a country’s fiscal position after the stimulus is sustainable. Moreover, these authors signal that the degree of financial market development and intermediation, as well as institutional features and the general macroeconomic and financial conditions in the domestic economy and externally, also have influence on the size and sign of a fiscal multiplier<sup>3</sup>.

Although there was a predominant view that fiscal policy should mainly operate through the work of automatic stabilizers, the latest economic crisis showed that a growing number of governments opted for *discretionarism* to boost economic activity<sup>4</sup>. Therefore, fiscal policy is at the focus of academic and policy makers’ debates concerning the question: *what is the transmission of fiscal policy shocks?* Especially in the case of an economic downturn, policymakers should be able to predict how a discretionary change in a fiscal instrument (or a set of instruments) will affect economic activity, in order to be as efficient and effective as possible in smoothing business cycles.

As already mentioned, among others, the answer is conditioned by the methodology used in identifying fiscal shocks and by the employed identification restrictions. Still, much of the empirical research in this area is based on two methodologies: (1) linear structural vector autoregression (SVAR) models and (2) linearized dynamic stochastic general equilibrium (DSGE) models<sup>5,6</sup>. Although frequently applied, both methodologies have two main shortcomings pinpointed by Parker (2011:6): first, the government spending multiplier is time-invariant and inde-

<sup>2</sup>It is important to point out that the agreement about the government spending effect on output is mainly due to the fact that much of the literature and research investigates fiscal policy on the basis of US data. Fiscal policy transmission mechanism is known to be country-specific (since there are no two identical tax and/or fiscal systems on the world) and therefore there are works based on the same country case that do not find such unambiguous results as in case of the US. For example, investigation into the case of Germany is not as conclusive as in the US case with respect to the size and statistical significance of the effect of government spending on output (Höppner, 2001; Perotti, 2005; Marcellino, 2002 and Heppke-Falk et al., 2006).

<sup>3</sup>For a detailed explanation of the mentioned determinants see Spilimbergo et al. (2009).

<sup>4</sup>Spilimbergo, Symansky and Schindler (2009) point out that countries turned to fiscal policy as their primary stabilization tool either because of changes in their monetary regime (such as currency board or participation in a monetary union) or because financial conditions deteriorated to the point at which monetary policy became ineffective.

<sup>5</sup>Moreover, the study of fiscal policy effects on economic activity proposes three additional schemes for identifying fiscal policy shocks: (1) the recursive approach introduced by Sims (1980), (2) the sign-restrictions approach developed by Mountford and Uhlig (2005), and (3) the event-study (narrative or Dummy approach) proposed by Ramey and Saphiro (1998) for studying the isolated effects of unexpected increases in government spending for defense purposes.

<sup>6</sup>Broad surveys of the literature estimating fiscal multipliers are provided in Parker (2011) and Ramey (2011).

pendent of the state of the economy, and second, a linear model forces a multiplier to be independent of the size of the stimulus.

The SVAR approach to investigating fiscal multipliers was introduced by Blanchard and Perotti (2002) in research on quarterly data about government spending, taxes and output in the US. Subsequently, much of the empirical research, including this, when investigating fiscal multipliers has relied on the Blanchard and Perotti (2002) SVAR method<sup>7</sup>. Table 1 summarizes selected main findings about spending and tax multipliers in developed and developing countries using such a methodological framework.

**TABLE 1**  
*SVAR based government spending and net taxes multipliers in selected studies*

Study	Sample	Spending multiplier		Tax multiplier	
		Short-term	Medium-term	Short-term	Medium-term
<b>Developed countries</b>					
Blanchard and Perotti (2002)	US 1947Q1–1997Q4	0.5	0.5	(-0.7,-1.3)	(-0.4,-1.3)
Biau and Girard (2007)	France 1978Q1–2003Q4	1.9	1.5	-0.5	-0.8
IMF (2005)	Portugal 1995Q3–2004Q4	1.32	1.07	–	–
Perotti (2004)	US 1960Q1–1979Q4	1.29	1.4	-1.41	-23.87
	US 1980Q1–2001Q4	0.36	0.28	0.7	1.55
	Germany 1960Q1–1974Q4	0.36	0.28	0.29	-0.05
	UK 1963Q1–1979Q4	0.48	0.27	-0.23	-0.21
	UK 1980Q1–2001Q2	-0.27	-0.6	0.43	0.7
Heppke-Falk et al. (2006)	Germany 1974Q1–2004Q4	0.62	1.27	no effect	no effect
Giordano et al. (2007)	Italy 1982Q1–2004Q4	1.2	1.7	0.16	–
De Castro and de Cos (2008)	Spain 1980Q1–2004Q4	1.3	1	positive	negative
Burriel et al. (2010)	Euro area 1981Q1–2007Q4	0.87	0.85	-0.63	-0.49
Baum and Koester (2011)	Germany 1976Q1–2009Q4	0.62	1.27	-0.66	-0.53
De Castro and Fernandez (2011)	Spain 1981Q1–2008Q4	0.94	0.55		
<b>Developing countries</b>					
Lonzano and Rodriguez (2009)	Colombia 1980Q1–2007Q4	1.12	1.20	positive	–
Mirdala (2009)	Czech R. 2000Q1–2008Q4	positive	–	no effect	–
	Slovak R. 2000Q1–2008Q4	positive	–	positive	–
	Hungary 2000Q1–2008Q4	positive	–	negative	–
	Bulgaria 2000Q1–2008Q4	positive	–	positive	–
	Romania 2000Q1–2008Q4	positive	–	positive	–
	Poland 2000Q1–2008Q4	positive	–	no effect	–

<sup>7</sup>Hebous for instance shows that in investigations of government spending effects, in a total of 42 country cases, 22 of them employ the Blanchard and Perotti SVAR, 9 the sign restriction approach, 5 the recursive framework while the narrative and expectation augmented setups are presented in 4 and 2 cases respectively (2009:13-15).

Study	Sample	Spending multiplier		Tax multiplier	
		Short-term	Medium-term	Short-term	Medium-term
<b>Developing countries</b>					
Crespo Cuaresma et al. (2011)	Czech R. 1995Q1–2009Q4	no effect	-0.04	no effect	0.03
	Hungary 1995Q1–2009Q4	0.01	0.01	no effect	-0.01
	Poland 1995Q1–2009Q4	no effect	-0.02	no effect	0.02
	Slovak R. 1996Q1–2009Q4	-0.01	0.00	-0.02	-0.1
	Slovenia 1996Q1–2009Q4	-0.01	-0.01	0.01	0.02
Jemec, Strojjan Kastelec and Delakorda (2011)	Slovenia 1995Q1–2010Q4	1.61	no effect	-0.38	no effect
Mancellari (2011)	Albania 1998Q1–2009Q4	0.36	–	1.4	–
Ravnik and Žilić (2011)	Croatia 2001M1–2009M12	negative	–	positive	–
Šimović and Deskar-Škrbić (2013)*	Croatia 2004Q1–2012Q4	2.18	1.91	-1.32	-0.81

*Notes: Short-term multiplier ranges from time of impact to one year span; medium-term multiplier refers to the time span going from one to two years, except in case of Crespo Cuaresma et al. (2011) and Mancellari (2011) when it goes to two years, i.e. maximum reported. Tax multipliers in Blanchard and Perotti (2002) are shown as range/interval.*

*\*In the case of Šimović and Deskar-Škrbić (2013) the results shown refer to multipliers at the consolidated general government level.*

*Source: Author's systematization.*

It is possible to observe from table 1 that fiscal multipliers are highly debatable. In developed countries spending multipliers are positive in all cases no matter of the time horizon under investigation, except in Perotti (2004) in the case of the United Kingdom. Same multipliers in developing countries are mostly positive in the short run and above unity in Slovenia (Jemec, Strojjan Kastelec and Delakorda, 2011) and Croatia (Šimović and Deskar-Škrbić, 2013). On the other hand tax multipliers do not exercise a certain effect on output. It is noticeable that not in all cases does an increase in taxes lead to a decrease in output, and moreover the magnitude of the effect is quite different in the studied cases.

Recent theoretical and empirical studies emphasize that one of the reasons why there is no conclusive evidence of fiscal policy effects may be found in the fact that government spending (and tax) multipliers may change over the business cycle, i.e. be larger in recessions than in expansions (Christiano, Eichenbaum and Rebelo, 2009; Woodford, 2010; Auerbach and Gorodnichenko, 2010a, 2010b, among others)<sup>8</sup>. These findings appear to be in line with Keynesian arguments in favor of using discretionary government spending in downturn periods to stimulate aggregate demand. Table 2 summarizes the spending and tax multipliers during recessions and expansions in selected studies. Among all it is worth noting

<sup>8</sup> It is important to point out that works in the field of fiscal policy when investigating state-dependent multipliers employ non-linear approaches, mainly STVAR and TVAR (threshold vector autoregressive) models. The main difference is that in a TVAR setup the economy discretely changes from one state to the other, i.e. it jumps from regime to regime, while a STVAR model allows such a switch to occur smoothly. Moreover, within a STVAR approach all observations are used for the estimation of parameters under both regimes.

that the highest negative short-term effect on output after a positive tax shock was recorded in France, being 1.6 in *bad* times and 0.7 in *good* times (Baum, Poplawski-Ribeiro and Weber, 2012), while a positive government spending shock in *bad* times mostly increases output in the short term in the euro area and the US (Batini, Callegari and Melina, 2012) with a multiplier of 2.6 and 2.2, respectively.

**TABLE 2**

*Government spending and net taxes multipliers in non-linear approaches in selected studies*

Study	Sample	Spending multiplier		Tax multiplier	
		Short-term	Medium-term	Short-term	Medium-term
<b>Developed countries</b>					
Baum, Poplawski-Ribeiro and Weber (2012)	Canada 1966Q1–2011Q2	R: -2.7 E: -0.8	R: -3.3 E: -1.1	R: -0.2 E: 0.2	R: -0.2 E: 0.2
	France 1970Q4–2010Q4	R: -0.7 E: 1.7	R: -1.1 E: 2.1	R: -1.6 E: -0.7	R: -2.2 E: -0.9
	Germany 1975Q3–2009Q4	R: 1.0 E: 0.4	R: 1.3 E: 0.4	R: -0.5 E: -0.6	R: -0.6 E: -0.8
	Japan 1970Q1–2011Q2	R: 1.6 E: 0.9	R: 1.8 E: 1.3	R: 0.2 E: 0.6	R: -0.2 E: 0.4
	UK 1970Q1–2011Q2	R: -0.1 E: 0.1	R: -0.1 E: 0.1	R: 0.1 E: 0.0	R: 0.1 E: -0.1
	US 1965Q2–2011Q2	R: 1.9 E: 1.6	R: 2.4 E: 2.4	R: -0.2 E: -0.4	R: -0.3 E: -0.5
Batini, Callegari and Melina (2012)	US 1975Q1–2010Q2	R: 2.2 E: 0.3	R: 2.2 E: -0.5	R: 0.2 E: 0.2	R: 0.7 E: 0.7
	Japan 1981Q1–2009Q4	R: 2.0 E: 1.4	R: 2.0 E: 1.1	R: -0.2 E: -0.3	R: 0.2 E: -0.1
	France 1970Q1–2010Q4	R: 2.1 E: 1.6	R: 1.8 E: 1.9	R: 0.0 E: -0.1	R: -0.3 E: -0.2
	Italy 1981Q1–2007Q4	R: 1.6 E: 0.4	R: 1.8 E: 0.5	R: 0.2 E: 0.1	R: 0.2 E: 0.1
	Euro area 1985Q1–2009Q4	R: 2.6 E: 0.4	R: 2.5 E: 0.1	R: 0.4 E: -0.2	R: 0.4 E: -0.1
Auerbach and Gorodnichenko (2010a)	US 1947Q1–2008Q4	R: 1.4 E: 0.0	R: 1.8 E: -0.1	–	–
Auerbach and Gorodnichenko (2010b)	OECD 1985–2010*	R: 0.5 E: -0.3	R: 0.4 E: -0.3	–	–

*Notes: Short-term multiplier ranges from time of impact to one-year span; medium-term multiplier refers to a time span of from one to two years. R stands for recession, while E for expansion. \*In case of Auerbach and Gorodnichenko (2010b) the dataset is based on semiannual data with a time span from 1985 to 2010 for "old" OECD members and from 1990 to 2010 for the "newer" OECD members.*

*Source: Author's systematization.*

Moreover, Romer and Bernstein (2009) estimate that a spending multiplier during the latest global financial crisis in US is at least 3. Similarly, Christiano, Eichenbaum and Rebelo (2009), Auerbach and Gorodnichenko (2010a, 2010b) and Bachmann and Sims (2012) find that spending multipliers on output and private consumption in US tend to rise during periods of economic downturns (up to the size of 3) while they are around zero during expansions. Empirical studies show that output multipliers of government consumption are larger in recessions, but they are even larger when monetary policy is highly accommodative, as in the case of the recent financial crisis when the monetary policy rate of most central banks was at its lower bound level. Christiano, Eichenbaum and Rebelo (2009) and Woodford (2010) show that when interest rates are at their effective low level, fiscal shocks tend to have amplified effects because government spending does not crowd out private spending, with multipliers as large as 10.

Most papers that investigate fiscal multipliers in *special* times focus on the case of developed countries (mainly the US), while there is almost no evidence that the same conclusion holds in the case of developing/emerging countries. In the latter fiscal policy often tends to be overwhelmingly procyclical, partly because of political incentives for governments to spend more generously and thus run large deficits in *good* times (for example, Kaminsky, Reinhart and Vegh, 2004; and Alesina, Campante and Tabellini, 2008). If this is the case then fiscal actions should be less effective irrespective of whether the economic times are *good* or *bad*.

### 3 DATA AND METHODOLOGY

The empirical analysis of fiscal multipliers in this paper is based on two methodologies. On one hand the Blanchard and Perotti (2002) SVAR setup is chosen from the set of linear approaches, while on the other hand, in order to investigate whether fiscal multipliers differ in Croatia in *good* and *bad* times, the smooth transition vector autoregression (STVAR) is applied, as in Auerbach and Gorodnichenko (2010b).

#### 3.1 THE SVAR SPECIFICATION

The baseline specification includes three variables: the log of real government spending  $g_t$ , the log of real output  $y_t$  and the log of real government revenue  $r_t$  (“net taxes” or “taxes” for short). Denoting the vector of endogenous variables by  $X_t$  and the vector of reduced form innovations by  $U_t$ , the reduced form VAR model can be written as:

$$X_t = C(L)X_{t-1} + U_t, \quad (5)$$

where  $X_t = [g_t \quad y_t \quad r_t]^T$ ,  $C(L)$  is a  $n \times n$  autoregressive lag polynomial matrix and

$$U_t = [u_t^g \quad u_t^y \quad u_t^r]^T.$$

<sup>9</sup> Reduced form residuals  $U_t$  represent a linear combination of different structural innovations and therefore have no economic interpretation.

The reduced form residuals  $u_t^g$  and  $u_t^r$  can be thought of as a linear combination of three components (Perotti, 2004:3): (1) the *automatic response* of taxes and government spending to innovations in output, (2) the *systematic discretionary response* of policymakers to output, and (3) the *random discretionary shocks* to fiscal policy. The latter encompasses the structural fiscal shocks, which unlike the reduced form residuals are uncorrelated among each other.

Defining the vector of spending, output and tax structural shocks as  $V_t = [v_t^g \ v_t^y \ v_t^r]^T$ ,  $U_t$  can be written as a linear combination of structural shocks  $V_t$  in the following way

$$AU_t = BV_t, \quad (6)$$

where  $A$  and  $B$  are  $n \times n$  matrices describing immediate relations between the reduced form residuals and the structural shocks<sup>10</sup>. Therefore, the structural VAR can be obtained by multiplying (5) by matrix  $A$  and using (6), which leads to the following:

$$AX_t = AC(L)X_{t-1} + BV_t \quad (7)$$

The matrix representation of the latter is:

$$\begin{bmatrix} 1 & -\alpha_y^g & -\alpha_r^g \\ -\alpha_g^y & 1 & -\alpha_r^y \\ -\alpha_g^r & -\alpha_y^r & 1 \end{bmatrix} \begin{bmatrix} u_t^g \\ u_t^y \\ u_t^r \end{bmatrix} = \begin{bmatrix} \beta_g^g & 0 & \beta_r^g \\ 0 & \beta_y^y & 0 \\ \beta_g^r & 0 & \beta_r^r \end{bmatrix} \begin{bmatrix} v_t^g \\ v_t^y \\ v_t^r \end{bmatrix} \quad (8)$$

Blanchard and Perotti (2002) argue that governments cannot react within the same quarter to changes of the macroeconomic setting mainly because fiscal policy decisions involve many agents (parliament, government and society) and therefore need a long period of time for implementation. Hence the *systematic discretionary response* is absent in quarterly data. Therefore the reduced-form fiscal shocks capture only the *automatic response* of fiscal variables to economic activity (meaning that  $\alpha_r^g = \alpha_r^y = \alpha_r^r = 0$ ).

Without loss of generality, one can write:

$$u_t^g = \alpha_y^g u_t^y + \beta_r^g v_t^r + \beta_g^g v_t^g, \quad (9)$$

$$u_t^y = \alpha_g^y u_t^g + \alpha_r^y u_t^r + \beta_y^y v_t^y, \text{ and} \quad (10)$$

$$u_t^r = \alpha_y^r u_t^y + \beta_g^r v_t^g + \beta_r^r v_t^r, \quad (11)$$

<sup>10</sup>In such a set up  $A$  and  $B$  are  $n \times n$  parameter matrices that require identifying restrictions to be imposed on  $A$  and  $B$  to obtain an unique relation, because reduced form residuals have no economic interpretation and different structural forms can give the same reduced form VAR model (see for instance Gottshalk, 2001).

where the  $\alpha^j$ 's capture the other two components and  $v_t^g$  and  $v_t^r$  are the *structural fiscal shocks*.

When this is the case, Blanchard and Perotti (2002) use available exogenous information on the elasticity of spending and taxes with respect to GDP to compute the appropriate value of the coefficients  $\alpha^j$ . These elasticities allow fiscal shocks to be constructed in cyclically adjusted terms as follows:

$$u_t^{g,CA} = u_t^g - \alpha_y^g u_t^y, \text{ and} \quad (12)$$

$$u_t^{r,CA} = u_t^r - \alpha_y^r u_t^y. \quad (13)$$

As mentioned earlier, this study assumes that expenditure does not respond to output within a quarter because it is predetermined in a budgetary plan and therefore not elastic in the short run. Thus,  $\alpha_y^g$  is set to zero according to the assumption that government spending is solely under the control of the fiscal authority. However, worth noting is that some recent studies challenge this assumption. Among others, Rodden and Wibbles (2010) find evidence of spending elasticity of 0.17 with respect to output at the state and local level in the US. However, this work (like others in this field) is based on annual data, so it is reasonable to assume that such a procyclicality vanishes in quarterly frequencies.

In line with Blanchard and Perotti (2002) the coefficient  $\alpha_y^r$  is estimated as the weighted average of different revenue components' output elasticity. The output elasticity of net taxes is 0.92 in the Croatian case (see appendix B for a detailed view about the estimations of exogenous elasticities), meaning that a 1% increase in output (GDP) generates a 0.92% increase in taxes. This estimation is in line with results obtained by studies covering other countries. It matches the tax elasticity with respect to output in the German case shown in Perotti (2002) but is lower than that in the US or Canada for example. If it is compared to the tax elasticity obtained in the Croatian case by Ravnik and Žilić (2011) it is 0.03 percentage point lower and not significantly different.

The recovered cyclically adjusted reduced form fiscal shocks represent a linear combination of the two structural fiscal policy shocks, i.e.

$$u_t^{g,CA} = \beta_r^g v_t^r + \beta_g^g v_t^g, \text{ and} \quad (14)$$

$$u_t^{r,CA} = \beta_g^r v_t^g + \beta_r^r v_t^r. \quad (15)$$

Assuming that a government tends to decide on expenditure first means that  $\beta_r^g = 0$ , and therefore:

$$u_t^{g,CA} = \beta_g^g v_t^g, \text{ while} \quad (16)$$

$$u_t^{r,CA} = \beta_g^r v_t^g + \beta_r^r v_t^r, \tag{17}$$

where  $\beta_g^r$  is estimated by OLS to retrieve the structural shocks to the fiscal variables.

The two estimated structural shocks are orthogonal to the structural shock of output and therefore can be used as instruments when estimating equation (10) using the instrumental variables approach.

So the just-identified three variable baseline SVAR model is the following<sup>11</sup>:

$$\begin{bmatrix} 1 & 0 & 0 \\ -\alpha_g^y & 1 & -\alpha_r^y \\ 0 & -0.92 & 1 \end{bmatrix} \begin{bmatrix} u_t^g \\ u_t^y \\ u_t^r \end{bmatrix} = \begin{bmatrix} \beta_g^g & 0 & 0 \\ 0 & \beta_y^r & 0 \\ \beta_g^r & 0 & \beta_r^r \end{bmatrix} \begin{bmatrix} v_t^g \\ v_t^y \\ v_t^r \end{bmatrix} \tag{18}$$

where OLS is adopted in estimating  $\beta_g^r$  and IV in estimating  $\alpha_g^y$  and  $\alpha_r^y$ . The estimates are presented in the following table.

**TABLE 3**  
*Estimated contemporaneous coefficients in the baseline SVAR model*

	$\beta_g^r$	$\alpha_g^y$	$\alpha_r^y$
	OLS	IV	IV
Coefficient	-0.079	0.018	-0.3537
(Standard errors)	(-1.277)	(0.048)	(0.125)
[P-value]	[0.207]	[0.698]	[0.005]

Source: Author's estimation.

The signs of the contemporaneous effects of spending and taxes on output are, as expected, positive and negative respectively. Moreover, the correlation between cyclically adjusted fiscal shocks results to be very low (-0.14) yielding very low estimates of  $\beta_g^r$ <sup>12</sup>.

Important to notice is that in alternative specifications the baseline model is extended for a GDP component (private consumption or private investment) to a four variable SVAR, where private consumption or investment in turn is ordered third<sup>13</sup>. Moreover, when investigating the effects of particular government spen-

<sup>11</sup> The system needs  $2n^2 - \left(\frac{n^2 - n}{2} + n\right)$  restrictions, where  $n$  is the number of endogenous variables.

<sup>12</sup> The correlation between cyclically adjusted fiscal shocks is very low also in the case when taxes are ordered first. Therefore, small values of  $\beta_g^r$  and  $\beta_r^g$  imply that the choice between ordering spending or taxes first does not influence impulse responses and proves the robustness of the results.

<sup>13</sup> This order follows the suggestion by Caldara and Kamps (2008), as in the case of the baseline model. For a detailed discussion on the assumptions behind such ordering, refer to their work. To recall, placing private consumption or private investment in the third place means it does not react contemporaneously to taxes, but is contemporaneously affected by government spending and output shocks.

ding component variable  $g_t$  is replaced by the component in question in the extended four variable VAR<sup>14,15</sup>.

### 3.2. THE STVAR SPECIFICATION

Auerbach and Gorodnichenko (2010a) extend the Blanchard and Perotti (2002) setup by allowing for responses differentiated across recessions and expansions in a regime switching vector autoregression framework, where transitions across states occur smoothly. The main advantage of the STVAR over the SVAR is that it effectively utilizes more information by exploiting variations in the degree to which the economy is in a particular regime (i.e. recession or expansion) so that estimation and inference for each regime is based on a larger set of observations (Auerbach and Gorodnichenko, 2010a:4). Estimating a SVAR for each regime separately may seriously limit the amount of observations in a regime, which makes estimates unstable and imprecise.

According to Auerbach and Gorodnichenko (2010a) the baseline smooth transition vector autoregression (STVAR) specification is:

$$X_t = (1 - F(z_{t-1}))\Pi_E(L)X_{t-1} + F(z_{t-1})\Pi_R(L)X_{t-1} + u_t, \quad (19)$$

$$\text{where } u_t \sim N(0, \Omega) \quad (20)$$

$$\Omega_t = \Omega_E(1 - F(z_{t-1})) + \Omega_R F(z_{t-1}) \quad (21)$$

$$F(z_t) = \frac{\exp(-\lambda z_t)}{1 + \exp(-\lambda z_t)} \text{ with } \lambda > 0, \quad (22)$$

$$\text{var}(z_t) = 1, E(z_t) = 0 \quad (23)$$

where  $X_t$  is the vector of endogenous variables, ordered again by taking into account the assumed contemporaneous effects amid variables,  $u_t$  a normal error term, and  $z_t$  is the indicator of the state of an economy, i.e. an index of the business cycle, normalized to have unit variance so that  $\lambda$  remains scalar invariant. A positive  $z$  indicates an expansionary phase, while oppositely a negative  $z$  indicates a contractionary phase of the business cycle. The matrices  $\Pi_i$  and  $\Omega_i$  (where  $i=R$  in recession and  $i=E$  in expansion) represent the coefficients and variance-covariance matrix of disturbances in two regimes that are the system in a sufficiently deep recession (when  $F(z_t) \approx 1$ ) and in a sufficiently strong expansion (when  $1 - F(z_t) \approx 1$ ). The weights assigned to each regime (expansion and recession) for a given weighting function  $F(\cdot)$  vary between 0 and 1 according to the contemporaneous state of the economy  $z_t$ <sup>16</sup>.

<sup>14</sup> Specific budget component elasticities to output and/or GDP components are reported in appendix B.

<sup>15</sup> Additional details about alternative models are given in appendix C.

<sup>16</sup> Auerbach and Gorodnichenko set  $z$  equal to a four- (2010a) and seven- (2010b) quarter moving average of the real output growth rate.

Following Auerbach and Gorodnichenko (2010a), this study employs the four quarter moving average of output growth rates as indicator of the state of the economy, and lambda is calibrated on the level of 1.5, making the economy spend 20 percent of the time in recessionary regimes<sup>17</sup>.

Such a model allows two ways for differences to occur in the propagation of structural shocks (Auerbach and Gorodnichenko, 2010a:5): (1) contemporaneous via differences in covariance matrices for disturbances  $\Omega_E$  and  $\Omega_R$ , and (2) dynamic via differences in lag polynomials  $\Pi_E(L)$  and  $\Pi_R(L)$ .

In their original work (2010a), Auerbach and Gorodnichenko implement a STVAR approach on a US dataset available in high frequencies, and thus are able to carry out highly nonlinear estimation for a large number of parameters<sup>18</sup>. Thus, in their following work (2010b, p. 3) such an approach for OECD countries would be very challenging due to the short time series with lower frequencies<sup>19</sup>.

Given the importance of expectations in identifying fiscal shocks, Auerbach and Gorodnichenko (2010b) extend the model and control for expectations by using real time forecasts and thus augmenting the equations for the unanticipated component of government spending and/or revenue ( $FE_t^{FI}$ , with  $FI$  being the fiscal instrument under examination). This unanticipated component was not accounted for in the SVAR approach; it is newly introduced and measured by the ratio between actual spending (or actual revenue) and its forecasted value in one period earlier (spending  $t$  in time  $t-1$ , or revenue  $t$  in time  $t-1$ )<sup>20</sup>. Therefore, the first step is to estimate the SVAR for  $X_t = [FE_t^g \quad g_t \quad y_t \quad r_t]^T$ <sup>21</sup>.

Since this is the case, Auerbach and Gorodnichenko (2010b) modify the aforesaid original approach and follow an approach previously advocated by Jorda (2005) and Stock and Watson (2007), among others, i.e. rather than estimating the entire system of equations in the STVAR and using these to estimate the impulse response functions, they estimate the impulse responses directly by projecting a variable of interest on its own lags and lags of other variables entering the VAR. As pinpointed by Auerbach and Gorodnichenko (2010b:4), this **direct projection**

<sup>17</sup> See appendix D for a plot of the transition function between regimes of expansions and recessions in the Croatian case. Moreover, it is important to stress that the growth rate data span used in estimating the weighting function is longer than the observation period in the models, i.e. it ranges from 1995Q1 to 2013Q1. In that way there is no loss of the first observations due to the four-quarter moving average representation.

<sup>18</sup> To inspect in detail the nonlinear estimation approach, see the appendix in Auerbach and Gorodnichenko (2010a).

<sup>19</sup> Although the time span of observations in the Croatian case used in this analysis goes back in history as much as possible, it can be considered relatively short, not only with respect to the available statistics in the case of the US, but also with respect to (older and newer) OECD member states.

<sup>20</sup> To obtain values of the unanticipated component Auerbach and Gorodnichenko (2010b:3) rely on several sources, such as surveys prepared by professional forecasters, projections prepared by governmental or international agencies, or other credible sources. In the Croatian case the sources and calculation of unanticipated components is presented in appendix A.

<sup>21</sup> For simplicity of notation the unanticipated component of government spending in the equations is denoted by  $FE_t^g$ , which corresponds to the variable defined in appendix A as  $FE_{t,spend}$ .

**approach** provides a flexible estimation method, which does not impose dynamic restrictions implicitly embedded in VARs and which can conveniently accommodate nonlinearities in the response function.

For example, if the interest is in determining the response of output  $y_t$  at horizon  $h$  after a government spending shock, bearing in mind the vector  $X_t = [FE_t^g \quad g_t \quad y_t \quad r_t]^T$ , then the estimation equation is:

$$\begin{aligned} y_{t+h} = & (1 - F(z_t))\Theta_{E,h}FE_t^g + F(z_t)\Theta_{R,h}FE_t^g \\ & + (1 - F(z_t))\Phi_{E,h}(L)g_{t-1} + F(z_t)\Phi_{R,h}(L)g_{t-1} \\ & + (1 - F(z_t))\Psi_{E,h}(L)y_{t-1} + F(z_t)\Psi_{R,h}(L)y_{t-1} \\ & + (1 - F(z_t))\Gamma_{E,h}(L)r_{t-1} + F(z_t)\Gamma_{R,h}(L)r_{t-1} + u_t \end{aligned} \quad (24)$$

with  $F(z_t)$  as defined in equation (22) and  $h=0, 1, \dots, H$ . The unanticipated component of government spending ( $FE_t^g$ ) represents the forecast error, i.e. the difference between forecasted and actual government spending in time  $t-1$  for period  $t$ . Thus  $FE_t^g$  can be interpreted as the “surprise government spending shock” (Auerbach and Gorodnichenko, 2010b:4).

The lag polynomials ( $\Phi_{E,h}(L), \Phi_{R,h}(L), \Psi_{E,h}(L), \Psi_{R,h}(L), \Gamma_{E,h}(L), \Gamma_{R,h}(L)$ ) in equation (24) are used to control for the history of shocks rather than to compute the dynamics, while the coefficients in  $\Theta_{E,h}$  and  $\Theta_{R,h}$  can be interpreted as multipliers that show the response of output to a structural shock in government spending in expansions and recessions respectively.

A linear equivalent of equation (24) is the following:

$$y_{t+h} = \Theta_{lin,h}FE_t^g + \Phi_{lin,h}(L)g_{t-1} + \Psi_{lin,h}(L)y_{t-1} + \Gamma_{lin,h}(L)r_{t-1} + u_t, \quad (25)$$

where the response of  $Y$  is constrained to be the same for all  $z_t$ 's<sup>22</sup>.

The estimation method as set in equation (20) has the following main advantages (Auerbach and Gorodnichenko, 2010b:6): (1) it involves only linear estimation if the parameter  $\lambda$  is fixed, (2) it allows just the equation related to the variable of interest (output, for example) to be estimated, and (3) it does not constrain the shape of the impulse response functions, rather than imposing the pattern generated by the SVAR.

### 3.3 THE DATA

As already mentioned, the baseline dataset includes a quarterly dataset from 1996Q1 to 2011Q4 for output ( $Y_t$ ), government spending ( $G_t$ ) and government revenue ( $R_t$  – also referred to as taxes or net taxes in the rest of the paper). Impor-

<sup>22</sup>Such a constraint implies that  $\Theta_{lin,h} = \Theta_{E,h} = \Theta_{R,h}$ ,  $\Phi_{lin,h}(L) = \Phi_{E,h}(L) = \Phi_{R,h}(L)$ ,  $\Psi_{lin,h}(L) = \Psi_{E,h}(L) = \Psi_{R,h}(L)$  and  $\Gamma_{lin,h}(L) = \Gamma_{E,h}(L) = \Gamma_{R,h}$  for all  $L$  and  $h$ .

tant to stress is that fiscal variables are defined as in Blanchard and Perotti (2002), i.e. both net of transfers, and at the consolidated central government level<sup>23</sup>. All variables are in logarithms, real terms (CPI deflated 2000=100) and seasonally adjusted using the ARIMA X12 algorithm.

According to the Augmented Dickey Fuller (ADF) test results, all variables present unit roots in levels and are stationary in first differences (table 4).

**TABLE 4**  
*Augmented Dickey Fuller test values*

H0: The variable has a unit root.

Variable	Deterministic component	test statistics	Variable	Deterministic component	test statistics
LY	c,t	-1.8110	$\Delta$ LY	c,t	-9.4757***
	c	-1.8825		c	-9.2081***
LG	c,t	-0.3815	$\Delta$ LG	c,t	-8.7127***
	c	-1.3053		c	-8.4404***
LR	c,t	-1.1244	$\Delta$ LR	c,t	-7.9141***
	c	-1.8792		c	-7.7397***

*Note: Variables' definition and symbols explained in appendix A; L is used to denote logarithms, while  $\Delta$  refers to first differences; variables are seasonally adjusted; constant included; maximum number of lags used is 12.*

*\* Null hypothesis rejected on 10% level of significance; test statistics' critical values according Davidson and MacKinnon (1993); \*\* null hypothesis rejected on 5% level of significance; \*\*\* null hypothesis rejected on 1% level of significance.*

*Source: Author's calculation.*

Moreover, results show the presence of co-integrating relations and hence a possible specification of a vector error correction model. But as noted by Heppke-Falk, Tenhofen and Wolff (2006:12), when estimating models that have many disaggregated time series it is difficult to find economically interpretable cointegration vectors. Moreover, Blanchard and Perotti (2002) find no significant differen-

<sup>23</sup> See appendix A for details about all variables used throughout the analysis. Moreover, it is important to point out that generally it is common empirical practice to analyze fiscal policy effects using consolidated general government data. Still, this paper (as well as others that investigate fiscal policy in Croatia – Benazić, 2006; Rukelj, 2009; Ravnik and Žilić, 2011, among others) bases the empirical part on consolidated central government data. It is important to stress that quarterly fiscal data for Croatia at the consolidated general government level are not available for the periods prior to the year 2004. Nevertheless, such a limitation should not pose significant differences, principally for two reasons: (1) discretionary decisions are carried by the central government, and (2) the share of local governments' budgets in the consolidated general budget is on average less than 10% and only 53 Croatian local units (out of a total of 576 – regions, cities and counties) are concerned. Moreover, Šimović and Deskar-Škrbić (2013) show that fiscal multipliers in Croatia differ across different government levels, but this is mainly true for the short-run, while the cumulative multiplier of government spending across 8 quarters turns out to be 1.80 and 1.91 at the consolidated central and general government respectively. The same authors also report that the peak government spending multiplier has the size of 1.20 and 1.39 at the consolidated central and the general government, respectively, while the lowest spending multiplier is 0.19 irrespective of the consolidation level.

ces between results obtained with and without taking the cointegrating relation into account<sup>24</sup>.

Although the system is stationary in first differences, the analysis is done using variables in levels, because the focus of the analysis is on the dynamics (i.e. impulse responses), not the coefficient estimation<sup>25</sup>. To choose the appropriate lag length the judgment is based on information criteria results, the length of the sample and economic sense. To be as parsimonious as possible the VAR lag selection tests included a maximum of four lags. The Akaike criterion (AIC) and final prediction suggest two lags, while the Schwarz Bayesian (SC) and Hannan-Quinn (HQC) criteria indicate one lag as optimal. This analysis will allow for dynamic interaction up to one lags as suggested by the Schwarz and Hannan-Quinn criteria. Such a choice is based on two assumptions: on one hand a lower lag reduces the probability of over fitting the model (because every additional parameter added substantially decreases the power of estimation), and on the other hand Lütkepohl (2005:326) shows that the Akaike criterion asymptotically overestimates the true order with some positive probability.

#### 4 RESULTS

According to the level specification, structural shocks represent as one percentage point increase in the policy variables, while impulse responses represent the percent change of the responding variable. Still, all fiscal multipliers shown are expressed in kuna<sup>26</sup>. To do so, the estimated multiplier value is multiplied by the ratio of the mean of the response variable (in kuna) to the mean of the respective impulse variable (in kuna)<sup>27</sup>. Reported fiscal multipliers for the SVAR approach include the impact multiplier, two cumulative multipliers (at the horizon of 12 quarters and one at 20 quarters) and the peak multiplier, which additionally in

<sup>24</sup> Krusec (2003) employs a SVEC (structural vector error correction) model to account for the cointegrating relation(s) and to differentiate between permanent and transitory shocks, when investigating the effects of fiscal policy on output in case of four EMU (Austria, Finland, Germany and Italy) and four non-EMU (US, Great Britain, Australia and Canada) countries. Still, results show that a government spending shock positively affects output, while a tax shock leads to a decrease in output, and the size (magnitude) of the effect is very similar to those obtained by other works using a SVAR setup.

<sup>25</sup> This is common empirical practice. Studies that estimate a SVAR in levels no matter of the stationarity in first differences are for instance Perotti (2002), Heppke-Falk, Tenhofen and Wolff (2006), de Castro and de Cos (2006), Jemec, Strojjan-Kastelec and Delakorda (2011), Ravnik and Žilić (2011). In addition, as demonstrated by Sims, Stock and Watson (1990) even if the system includes non-stationary variables, the OLS estimators are still consistent when the model is estimated in levels.

<sup>26</sup> As mentioned, this Section reports multipliers monetarized in kuna, while the impulse response functions are presented in appendix E.

<sup>27</sup> For example: say that the estimated impact multiplier of government spending on output is 0.15 and the ratio of the mean of GDP to the mean of government spending is 2.5, then at impact a one kuna increase in government spending leads to an increase in output of 38 lipa ( $=0.15 \times 2.5$ ). It is important to point that Ramey and Zubairy (2013) discuss on the US case how such a procedure in converting percentage changes into dollar changes is not precise and leads to higher values of fiscal multipliers. The authors stress that the ratio of the mean of output to the mean of government spending on the US case depends upon the time span of the sample, varying from 2 to 24 in the 1889-2009 sample or from 4-7 in the post WWII sample. Therefore, Ramey and Zubairy (2013:9-10) suggest an *ex ante* conversion of output and government spending to the same units using the value of G/Y in each point of time and not averaging. However, such a conversion can be omitted in the Croatian case, since the already limited time-span in case of shortening does not lead to significantly different ratios of the mean of GDP to the mean of government spending.

parenthesis shows the quarter in which the peak occurs. For the STVAR, i.e. regime switching and no-regime switching model, average multipliers are reported over three horizons (eight, twelve and twenty quarters)<sup>28,29</sup>. Important to notice is that, not only due to different methodological approaches, presented fiscal multipliers may not be directly comparable, but this reporting strategy better highlights the differences between obtained regime- and no-regime switching models, which is the main point of this paper. The main point of the STVAR is estimating multipliers in the expansionary and recessionary phases of the business cycle. Moreover, in all STVAR specifications a linear representation of the corresponding model has been estimated as in equation (25), but these results are not reported since there is no case where they significantly differ from those obtained using the SVAR.

#### 4.1 BASELINE MODEL RESULTS

Table 5 shows the multiplier effect of government spending and net taxes on output in Croatia using the Blanchard and Perotti estimation approach.

No matter the methodological framework, a positive spending shock positively affects output, while a positive tax shock negatively affects output in Croatia. These findings are in line with those shown in Grdović Gnip (2013) when a five variable SVAR Blanchard and Perotti approach is used<sup>30</sup>. Next, it is possible to observe that macroeconomics reacts according to the Keynesian assumption of higher multiplier effect in downturn times, the average multiplier being above 2 and significant, meaning that a one kuna increase in government spending would lead to an increase in output of more than 2 kuna in the medium and long term.

In the SVAR approach output reacts negatively to a tax shock only at impact, while in the STVAR setting the reaction follows the same pattern in recession times, while in expansion times it results to be negative irrespective of the time horizon but also insignificant. Moreover, all multipliers in expansion times are insignificant.

<sup>28</sup> The average multiplier in recession and expansion is calculated as  $\frac{1}{1+H} \sum_{h=0}^H \Theta_{R,h}$  and  $\frac{1}{1+H} \sum_{h=0}^H \Theta_{E,h}$  respectively.

<sup>29</sup> Important to point out is that Ramey and Zubairy (2013) as well as Owyang, Ramey and Zubairy (2013) provide a detailed discussion about pitfalls in reporting fiscal multipliers in normal and recessionary times. In doing so, they focus on the Auerbach and Gorodnichenko (2010b) direct projection method as the most widely implemented during the last years. Owyang, Ramey and Zubairy (2013) point out that Auerbach and Gorodnichenko's multipliers are overestimated due to their fundamental assumption how a positive shock to government spending during a low-growth state does not help the economy escape that state. Moreover, they add that the Auerbach and Gorodnichenko assumption about the recession lasting 20 quarters is unrealistic since the data provide information about shorter recessionary periods in the US. Above that, the authors conclude that spending multipliers calculated as in Auerbach and Gorodnichenko (2010a, 2010b) show the response of output after a government spending shock without being rescaled for the effects the same shock exercises on the development in government spending. In line with Auerbach and Gorodnichenko this work also reports the average multiplier across 8, 12 and 20 periods (quarters), being these the average response of output in time  $t+h$  (where  $h$  equals to 8, 12 or 20) after the initial shock in government spending.

<sup>30</sup> The five-variable SVAR includes prices and interest rates in addition to government spending, output and taxes.

TABLE 5

Fiscal multipliers in the baseline SVAR and STVAR models

	Government spending multiplier (G)	Tax multiplier (R)
<b>SVAR Blanchard and Perotti</b>		
Impact multiplier	0.33	-0.03
Cumulative multiplier (h=12)	1.84	0.34
Cumulative multiplier (h=20)	2.66	0.65
Peak multiplier (q)	0.33 (0)	0.04 (8)
<b>STVAR – regime switch: recession</b>		
Average multiplier (h=8)	2.12	-0.02
Average multiplier (h=12)	2.18	0.02
Average multiplier (h=20)	2.21	0.40
<b>STVAR – regime switch: expansion</b>		
Average multiplier (h=8)	<i>0.40</i>	<i>-0.02</i>
Average multiplier (h=12)	<i>1.00</i>	<i>-0.02</i>
Average multiplier (h=20)	<i>0.58</i>	<i>-0.03</i>

Note: Numbers in italic mean that the estimate is not significant at the 95% confidence level.

Source: Author's estimation.

Robustness of the baseline models was checked by means of several alternatives. In the case of the SVAR approach the estimation was redone by (i) assuming that taxes come first and (ii) using different output elasticity of taxes, i.e. those obtained by Ravnik and Žilić (2011). In the case of the STVAR approach the robustness was checked by (i) replacing the transition variable output growth rates with output gap<sup>31</sup> and (ii) trying a different calibration of lambda, i.e. 0.8, as calibrated by Auerbach and Gorodnichenko (2010a) for the US, plus 3 and 5 to make the transition between regimes even smoother or more abrupt.

## 4.2 ALTERNATIVE MODELS

As mentioned earlier alternative models are extended by one variable, i.e. private consumption and private investment in turn, ordered after output and before the government revenue (tax) variable. When the effects of different spending components are analyzed, then the component under investigation replaces the government spending variable in the extended model. Similarly, when direct and indirect tax effects are studied, the net taxes variable is replaced<sup>32</sup>.

### 4.2.1 Effects on private consumption and private investment

Government spending, as well as a tax shock, exercises a Keynesian effect on private consumption. As shown in table 6 a positive government spending shock

<sup>31</sup> HP filtered output gap with  $\lambda=1600$  and  $\lambda=480$  (the first is standard for quarterly data, while for the latter refer to Bouthevillain et al., 2001).

<sup>32</sup> It is important to point out that in the case of an extended SVAR model the equation regarding net taxes needs to be adjusted for additional exogenous elasticities, presented in appendix B.

increases private consumption, while a positive tax shock decreases the same macroeconomic variable.

**TABLE 6**

*Private consumption multipliers to fiscal shocks in the alternative SVAR and STVAR models*

	Government spending multiplier (G)	Tax multiplier (R)
<b>SVAR Blanchard and Perotti</b>		
Impact multiplier	0.04	-0.02
Cumulative multiplier (h=12)	0.73	-0.29
Cumulative multiplier (h=20)	1.22	-0.46
Peak multiplier (q)	0.06 (8)	-0.02 (0)
<b>STVAR – recession</b>		
Average multiplier (h=8)	1.07	-0.08
Average multiplier (h=12)	1.09	<i>0.05</i>
Average multiplier (h=20)	1.02	<i>0.13</i>
<b>STVAR – expansion</b>		
Average multiplier (h=8)	0.77	<i>0.04</i>
Average multiplier (h=12)	0.58	<i>0.07</i>
Average multiplier (h=20)	0.35	<i>0.03</i>

*Note: Numbers in italic mean that the estimate is not significant at the 95% confidence level.*

*Source: Author's estimation.*

Moreover, it is possible to observe that the multiplier is much higher (and significant) in recession, while fiscal multipliers in expansion times seem to be mostly insignificant. According to the SVAR approach a one kuna government spending increase will on impact raise private consumption by four lipa, but in the long term the effect will reach 1.22 kuna. In contrast, a one kuna increase in taxes will on impact decrease private consumption by just two lipa, but in the long term the decrement is about 46 lipa.

If the regime-switch model is considered then in downturn times the effect of the multiplier is much stronger and has a stronger effect on boosting the economy. That is, if during recessions an increase in government spending of one kuna occurs, private consumption will rise by 1.07 kuna on average per quarter during the first two years. On the other hand the effect on private investment is meager and insignificant (table 7).

It is possible to notice that effects of fiscal policy on private investment are mostly significant at impact when a positive spending shock raises private investment and a positive tax shock leads to a negative effect on private investment. The multiplier effect is thus stronger in recessions than in expansions, the average tax multiplier not being significant in the medium- and long-term.

TABLE 7

Private investment multipliers to fiscal shocks in the alternative SVAR and STVAR models

	Government spending multiplier (G)	Tax multiplier (R)
<b>SVAR Blanchard and Perotti</b>		
Impact multiplier	0.05	-0.03
Cumulative multiplier (h=12)	0.35	-0.11
Cumulative multiplier (h=20)	<i>0.47</i>	<i>-0.15</i>
Peak multiplier (q)	0.05 (0)	<i>0.0 (10)</i>
<b>STVAR – recession</b>		
Average multiplier (h=8)	0.56	-0.19
Average multiplier (h=12)	0.39	<i>-0.14</i>
Average multiplier (h=20)	0.30	<i>-0.03</i>
<b>STVAR – expansion</b>		
Average multiplier (h=8)	0.39	<i>0.15</i>
Average multiplier (h=12)	0.30	<i>0.13</i>
Average multiplier (h=20)	<i>0.20</i>	<i>0.12</i>

Note: Numbers in italic mean that the estimate is not significant at the 95% confidence level.

Source: Author's estimation.

#### 4.2.2 Effect of different spending components

As mentioned in the introductory section a number of countries implemented fiscal stimuli packages during the latest financial crisis. In order to investigate what spending category would be at most effective in the Croatian case this section presents fiscal multipliers with respect to output, private consumption and private investment for three main government spending categories, i.e. spending for purchases of goods and services, spending for wages and capital spending.

Table 8 presents multipliers of spending for purchases of goods and services and it is noticeable that in the case of a regime-switching model the multipliers are higher than in the case of the linear approach. If considering the latter a one kuna increase in spending for purchases of goods and services at impact decreases output and private consumption by three and one lipa respectively, the effect being much larger in three years, i.e. there is increase of 33 and 24 lipa respectively.

On the other hand during recessions the average multiplier is higher in the first eight quarters, meaning that a one kuna increase in this spending component will raise output, private consumption and private investment by 3.89, 2.16 and 0.61 kuna respectively. In all these cases the effect is significant. It is interesting that the impact of a spending shock in expansionary times is shown to be high but statistically insignificant.

TABLE 8

*Government expenditure for purchases of goods and services multipliers in the alternative SVAR and STVAR models*

	Output	Private consumption	Private investment
<b>SVAR Blanchard and Perotti</b>			
Impact multiplier	-0.03	-0.01	0.01
Cumulative multiplier (h=12)	0.33	0.24	<i>0.06</i>
Cumulative multiplier (h=20)	<i>0.67</i>	<i>0.44</i>	<i>0.09</i>
Peak multiplier (q)	0.04 (10)	0.02 (11)	0.01 (4)
<b>STVAR – recession</b>			
Average multiplier (h=8)	3.89	2.16	0.61
Average multiplier (h=12)	3.04	1.73	0.35
Average multiplier (h=20)	2.21	1.27	<i>0.24</i>
<b>STVAR – expansion</b>			
Average multiplier (h=8)	4.42	2.65	<i>1.07</i>
Average multiplier (h=12)	<i>3.31</i>	<i>1.89</i>	<i>0.77</i>
Average multiplier (h=20)	2.26	<i>1.16</i>	<i>0.45</i>

*Note: Numbers in italic mean that the estimate is not significant at the 95% confidence level.*

*Source: Author's estimation.*

Spending for wages does not exercise as large an effect on macroeconomic variables as spending for purchases of goods and services. Table 9 presents the results and it is shown that the effect is not significant in most of the cases, for both output cumulative multipliers are insignificant, as are one or two average multipliers in recession times and all multipliers in expansionary times. Nevertheless, in a linear setting, on impact a one kuna increase in spending for wages raises output, private consumption and private investment on impact by four, two and nine lipa respectively. In recessionary times the same impact is 4.04, 2.22 and 0.58 kuna respectively on average for the first eight quarters.

A one-kuna increase in capital spending will increase output and private consumption on impact by 47 and 12 lipa respectively. In the medium term the effect on output will be more prominent because according to the SVAR approach output will increase 1.20 kuna in three years (table 10).

As in the case of other spending components, the effect of a capital spending shock is much higher during economic downturns than in expansions when in addition it is seen to be insignificant. Although it is expected that a government investment will increase private investment, the SVAR approach is not conclusive regard this fact, while the multiplier in the case of a recession in the regime-switch model is lower than one.

TABLE 9

Government expenditure for wages multipliers in the alternative SVAR and STVAR models

	Output	Private consumption	Private investment
<b>SVAR Blanchard and Perotti</b>			
Impact multiplier	0.04	0.02	0.09
Cumulative multiplier (h=12)	<i>0.01</i>	<i>0.01</i>	<i>0.31</i>
Cumulative multiplier (h=20)	<i>-0.06</i>	<i>-0.05</i>	<i>0.31</i>
Peak multiplier (q)	0.04 (0)	0.02 (0)	0.09 (0)
<b>STVAR – recession</b>			
Average multiplier (h=8)	4.04	2.22	0.58
Average multiplier (h=12)	3.29	<i>1.71</i>	0.37
Average multiplier (h=20)	2.26	<i>1.20</i>	<i>0.17</i>
<b>STVAR – expansion</b>			
Average multiplier (h=8)	<i>1.68</i>	<i>0.94</i>	<i>0.47</i>
Average multiplier (h=12)	<i>1.26</i>	<i>0.70</i>	<i>0.35</i>
Average multiplier (h=20)	<i>0.78</i>	<i>0.40</i>	<i>0.20</i>

Note: Numbers in italic mean that the estimate is not significant at the 95% confidence level.

Source: Author's estimation.

TABLE 10

Government capital expenditure multipliers in the alternative SVAR and STVAR model

	Output	Private consumption	Private investment
<b>SVAR Blanchard and Perotti</b>			
Impact multiplier	0.47	0.12	<i>-0.01</i>
Cumulative multiplier (h=12)	<i>1.20</i>	<i>0.04</i>	<i>-0.02</i>
Cumulative multiplier (h=20)	<i>0.95</i>	<i>0.41</i>	<i>-0.03</i>
Peak multiplier (q)	0.47 (0)	0.12 (0)	<i>0.00 (3)</i>
<b>STVAR – recession</b>			
Average multiplier (h=8)	2.50	1.40	0.61
Average multiplier (h=12)	2.23	1.26	0.42
Average multiplier (h=20)	1.83	1.03	0.20
<b>STVAR – expansion</b>			
Average multiplier (h=8)	<i>0.58</i>	<i>0.33</i>	<i>0.19</i>
Average multiplier (h=12)	<i>0.35</i>	<i>0.22</i>	<i>0.17</i>
Average multiplier (h=20)	<i>0.20</i>	<i>0.06</i>	<i>0.10</i>

Note: Numbers in italic mean that the estimate is not significant at the 95% confidence level.

Source: Author's estimation.

The results are similar and in line with the significance time horizon to those of Grdović Gnip (2013), where spending components were disaggregated into current and capital in a five-variable Blanchard and Perotti SVAR approach.

## 5 CONCLUDING REMARKS

During the latest financial crisis a large number of countries and respective economic authorities opted for fiscal policy measures to boost economic activity. This paper investigates the effectiveness of fiscal multipliers on the Croatian case and shows that an expansionary fiscal policy during recessions could be a powerful stabilization tool. It is shown that in a regime-switch model the multipliers are much larger than in a no-regime switch approach.

A one-kuna increase in government spending would lead to an increase in output of more than 2 kuna in the medium and long term in economic downturns. According to the SVAR approach a government spending of one kuna will on impact raise private consumption by four lipa, but in the long term the effect will be 1.22 kuna. In contrast, an increase in taxes of one kuna will on impact decrease private consumption by just two lipa, but in the long term the decrement is about 46 lipa. If during recessions an increase in government spending of one kuna occurs, private consumption will rise by 1.07 kuna on average per quarter during the first two years.

When investigating the possible trilemma concerning spending for purchases of goods and services, wages or capital goods, there are actually no doubts in times of recessions. That is, the effect of the shock in the purchase of goods and services is significant throughout the whole time horizon and a one kuna increase in this component will raise output, private consumption and private investment by 3.89, 2.16 and 0.61 kuna respectively.

Nevertheless, these results can be considered as indicative since there is a need to extend the research in two main directions. On the one hand the effects of different taxes (direct and indirect) in a regime-switching model should be investigated. The Croatian government made a number of discretionary changes (mainly with respect to taxes and not spending) during the latest recession (starting with the crisis tax, the VAT rate increment and so on), which according to the literature could not be considered as counter-cyclical. Since this research has shown that the effects of taxes (as well as spending) are larger and more significant in recessionary times such government decisions may have deepened the recession (keeping in mind that nothing particularly “strong” has been done on the expenditure side of the budget to offset the effects of the tax measures). This may be one of the key issues why Croatia has experienced one of the longest recession periods amid EU countries.

On the other hand, no research in the field of fiscal multipliers based on the Croatian case has so far provided information about the possible driving forces of fiscal multipliers such as indebtedness or openness to trade, either in linear or in non-linear models. This extension would show the effect of particular economic factors on fiscal multipliers and would exhibit whether the magnitude of the multipliers would change and in which direction.

On top of that, it is important to point out that this paper uses consolidated central government data because consolidated general government data for Croatia are available only from 2004 onward. Using the latter data set would imply a short time-span, which could affect the power of test, and not only in the SVAR setup, but especially in the STVAR setup where the baseline already includes additional variables. Furthermore, encompassing just the period 2004-2012 would mean having two additional limitations: (1) the data would embrace only one recession period and this could also affect the results, since it is better to have as many “jumps” between different states of the economy as possible, plus (2) the “only recession period” would be represented by the latest crisis, which comes at the end of the observation period meaning that there is (still) no registered switch (and or data set) to a following subsequent recovering/expansionary phase.

Therefore, when the potential period under investigation involves a longer time series (and therefore a higher number of observations) not necessitating particular assumptions that restrict the tests by possibly doing harm to the degrees of freedom, a non-linear approach at the general government level should be considered. This could make the results of fiscal policy effects more precise. Moreover, an extended observation sample would permit an “extended” baseline STVAR (or another regime switching) model by incorporating more endogenous or exogenous variables, resulting in even more accurate estimations.

Symbol	Name and description
<b>Y</b>	<b>Output</b>
	Definition: Gross domestic product in real terms. The series spans from 1995Q1–2011Q4.
	Units: HRK, 2,000 reference prices
	Source: For the period 1994-1997 Mikulić and Lovrinčević (2000); for the period 1998-2011 Croatian Bureau of Statistics' Press Releases available at the Croatian Bureau of Statistics Official Web Page.
<b>C</b>	<b>Private consumption</b>
	Definition: Private consumption in real terms. The series spans from 1995Q1–2011Q4.
	Units: HRK, 2,000 reference prices
	Source: For the period 1994-1997 Mikulić and Lovrinčević (2000); for the period 1998-2011 Croatian Bureau of Statistics' Press Releases available at the Croatian Bureau of Statistics Official Web Page.
<b>I</b>	<b>Investment</b>
	Definition: Investment in real terms. The series spans from 1995Q1–2011Q4.
	Units: HRK, 2,000 reference prices
	Source: For the period 1994-1997 Mikulić and Lovrinčević (2000); for the period 1998-2011 Croatian Bureau of Statistics' Press Releases available at the Croatian Bureau of Statistics Official Web Page.
<b>G</b>	<b>Net government expenditure</b>
	Government expenditure as in Blanchard and Perotti (2002), i.e. total purchases of goods and services plus capital spending at the central government level in real terms. As in the referred work, this variable expresses expenditure net of transfers. <i>Note: GFS 1986 was the official Croatian government finance statistics methodology until 2004, when the new IMF methodology, i.e. the GFS 2001, was adopted. Since that would pose a structural break in the data, aggregated fiscal data for the period 2004-2011 were reclassified according to the GFS 1986 methodology (for details see Grdović Gnip, 2011:48, 67 and its references).</i>
	Definition: The series spans from 1996Q1–2011Q4.
	Units: HRK, 2000 reference prices.
	Source: Statistical Reports of the Ministry of Finance, Republic of Croatia available at the Ministry of Finance Official Web Page. Author's estimation.
<b>R</b>	<b>Net taxes</b>
	Net taxes in the sense of Blanchard and Perotti (2002), i.e. personal income tax plus corporate income tax plus indirect taxes plus social security contributions minus transfers to persons and minus interest payments, in real terms. Still, transfers to persons are proxied by the unemployment related expenditure only due to the unavailability of the data for the period prior to year 2004.
	Definition: <i>Note: GFS 1986 was the official Croatian government finance statistics methodology until 2004, when the new IMF's methodology, i.e. the GFS 2001 was adopted. Since that would pose a structural break in the data, aggregated fiscal data for the period 2004-2011 were reclassified according to the GFS 1986 methodology (for details see Grdović Gnip, 2011:48, 67 and its references).</i>
	The series spans from 1996Q1–2011Q4.

<b>Symbol</b>	<b>Name and description</b>
	Units: HRK, 2,000 reference prices
	Source: Statistical Reports of the Ministry of Finance, Republic of Croatia available at the Ministry of Finance Official Web Page, and Ministry of Finance. Author's estimation.
<b>Ecur_r</b>	<b>Current expenditure</b>
	Definition: Central government budget current expenditure in real terms. The series spans the period from 1996Q1–2011Q4.
	Units: HRK, 2,000 reference prices
	Source: Statistical Reports of the Ministry of Finance, Republic of Croatia available at the Ministry of Finance Official Web Page.
<b>Ecap_r</b>	<b>Capital expenditure</b>
	Central government budget capital expenditure in real terms. It is used as a proxy for public investment as well. <i>Note: Data for all expenditure subcategories, therefore capital expenditure as well, for the period from June 2003 to October 2003 are not available in the Statistical Reports of the Ministry of Finance on a monthly basis. Still, data of the sum between capital and current expenditures are available, so capital expenditure is obtained by subtracting current from total expenditure.</i> The series spans the period from 1996Q1–2011Q4.
	Units: HRK, 2,000 reference prices
	Source: Statistical Reports of the Ministry of Finance, Republic of Croatia available at the Ministry of Finance Official Web Page.
<b>Ewages_r</b>	<b>Expenditure for wages</b>
	Current expenditure for gross wages and social contributions from the central government budget in real terms. It is used as proxy for public employment. <i>Note: Data for all expenditure subcategories, therefore expenditure for employees as well, for the period from June 2003 to October 2003 are not available in the Statistical Reports of the Ministry of Finance on a monthly basis. Still, data of the cumulative sum of this expenditure for the period January-November 2003 are available. Available data from January to June were subtracted from the available cumulative sum, and then the missing data are obtained by interpolating the residue sum between the missing months using as a pattern the monthly growth rates of current expenditure.</i> The series spans the period from 1997Q4–2011Q4.
	Units: HRK, 2,000 reference prices
	Source: Statistical Reports of the Ministry of Finance, Republic of Croatia available at the Ministry of Finance Official Web Page.
<b>Epur_r</b>	<b>Expenditure for purchases of goods and services</b>
	Current expenditure for purchases of goods and services from the central government budget in real terms. It is used as proxy for public consumption. <i>Note: Data for all expenditure subcategories, therefore expenditure for purchases of goods and services as well, for the period from June 2003 to October 2003 are not available in the Statistical Reports of the Ministry of Finance on a monthly basis. Still, data of the cumulative sum of this expenditure for the period January-November 2003 are available. Available data from January to June were subtracted from the available cumulative sum, and then the missing data are obtained by interpolating the residue sum between the missing months using as a pattern the monthly growth rates of current expenditure.</i> The series spans the period from 1997Q4–2011Q4.

Symbol	Name and description
	Units: HRK, 2,000 reference prices
	Source: Statistical Reports of the Ministry of Finance, Republic of Croatia available at the Ministry of Finance Official Web Page.
<b>FEgspend</b>	<b>Unanticipated component in net government spending (Ebr)</b>
	Ratio between the outturn (realization) of net government spending and the one-quarter-ahead forecast (plan). <i>Note: Planned values of net government spending are usually presented in the Croatian Official Gazette in December of year t for year t+1 (or exceptionally in January of year t+1 for year t+1) for the central budget level. Since forecast values of government spending are available on an annual basis only, interpolation is used to get a quarterly series and the procedure is based on quarterly growth rates of government spending outturn. The series spans the period from 1995Q2–2011Q4.</i>
	Definition:
	Units: Ratio
	Source: Statistical Reports of the Ministry of Finance, Republic of Croatia available at the Ministry of Finance Official Web Page, and Ministry of Finance. Official gazette's following numbers: NN 98/1994, 9/1996, 111/1996, 141/1997, 167/1998, 33/2000, 130/2000, 116/2001, 154/2002, 31/2004, 171/2004, 148/2005, 137/2006, 28/2008, 149/2008, 151/2010 and 140/2011. Author's estimation.
<b>FEtaxes</b>	<b>Unanticipated component in net taxes (Rbr)</b>
	Ratio between the outturn (realization) of net taxes and the one-quarter-ahead forecast (plan). <i>Note: Planned values of taxes are usually presented in the Croatian Official gazette in December of year t for year t+1 (or exceptionally in January of year t+1 for year t+1) for the central budget level. Since forecast values of taxes are available on an annual basis only, interpolation is used to get a quarterly series and the procedure is based on quarterly growth rates of total taxes outturn. The series spans the period from 1995Q2–2011Q4.</i>
	Definition:
	Units: Ratio
	Source: Statistical Reports of the Ministry of Finance, Republic of Croatia available at the Ministry of Finance Official Web Page, and Ministry of Finance. Official Gazette, the following numbers: NN 98/1994, 9/1996, 111/1996, 141/1997, 167/1998, 33/2000, 130/2000, 116/2001, 154/2002, 31/2004, 171/2004, 148/2005, 137/2006, 28/2008, 149/2008, 151/2010 and 140/2011. Author's estimation.
<b>FEcurE</b>	<b>Unanticipated component in current government spending (Ecur)</b>
	Ratio between the outturn (realization) of current government spending and the one-quarter-ahead forecast (plan). <i>Note: Planned values of current government spending are usually presented in the Croatian Official gazette in December of year t for year t+1 (or exceptionally in January of year t+1 for year t+1) for the central budget level. Since forecast values of current government spending are available on an annual basis only, interpolation is used to get a quarterly series and the procedure is based on quarterly growth rates of current government spending outturn. The series spans the period from 1995Q2–2011Q4.</i>
	Definition:
	Units: Ratio

Symbol	Name and description
	<p>Statistical Reports of the Ministry of Finance, Republic of Croatia available at the Ministry of Finance Official Web Page, and Ministry of Finance.</p> <p>Source: Official Gazette, the following numbers: NN 98/1994, 9/1996, 111/1996, 141/1997, 167/1998, 33/2000, 130/2000, 116/2001, 154/2002, 31/2004, 171/2004, 148/2005, 137/2006, 28/2008, 149/2008, 151/2010 and 140/2011. Author's estimation.</p>
<b>FEpurE</b>	<b>Unanticipated component in government spending for purchases of goods and services (Epur)</b>
	<p>Ratio between the outturn (realization) of expenditure for purchases of goods and services and the one-quarter-ahead forecast (plan).</p> <p><i>Note: Planned values of government spending for purchases of goods and services are usually presented in the Croatian Official gazette in December of year t for year t+1 (or exceptionally in January of year t+1 for year t+1) for the central budget level. Since forecast values are available on an annual basis only, interpolation is used to get a quarterly series and the procedure is based on quarterly growth rates of government spending for purchases of goods and services outturn.</i></p> <p>The series spans the period from 1997Q4–2011Q4.</p>
	<p>Definition:</p>
	<p>Units: Ratio</p>
	<p>Source: Statistical Reports of the Ministry of Finance, Republic of Croatia available at the Ministry of Finance Official Web Page, and Ministry of Finance. Official Gazette, the following numbers: NN 98/1994, 9/1996, 111/1996, 141/1997, 167/1998, 33/2000, 130/2000, 116/2001, 154/2002, 31/2004, 171/2004, 148/2005, 137/2006, 28/2008, 149/2008, 151/2010 and 140/2011. Author's estimation.</p>
<b>FEwagesE</b>	<b>Unanticipated component in government spending for wages (Ewages)</b>
	<p>Ratio between the outturn (realization) of expenditure for wages and the one-quarter-ahead forecast (plan).</p> <p><i>Note: Planned values of government spending for wages are usually presented in the Croatian Official gazette in December of year t for year t+1 (or exceptionally in January of year t+1 for year t+1) for the central budget level. Since forecast values are available on an annual basis only, interpolation is used to get a quarterly series and the procedure is based on quarterly growth rates of government spending for wages outturn.</i></p> <p>The series spans the period from 1997Q4–2011Q4.</p>
	<p>Definition:</p>
	<p>Units: Ratio</p>
	<p>Source: Statistical Reports of the Ministry of Finance, Republic of Croatia available at the Ministry of Finance Official Web Page, and Ministry of Finance. Official Gazette, the following numbers: NN 98/1994, 9/1996, 111/1996, 141/1997, 167/1998, 33/2000, 130/2000, 116/2001, 154/2002, 31/2004, 171/2004, 148/2005, 137/2006, 28/2008, 149/2008, 151/2010 and 140/2011. Author's estimation.</p>
<b>FEcapE</b>	<b>Unanticipated component in capital government spending (Ecap)</b>
	<p>Ratio between the outturn (realization) of capital expenditure and the one-quarter-ahead forecast (plan).</p> <p><i>Note: Planned values of capital government spending are usually presented in the Croatian Official gazette in December of year t for year t+1 (or exceptionally in January of year t+1 for year t+1) for the central budget level. Since forecast values are available on an annual basis only, interpolation is used to get a quarterly series and the procedure is based on quarterly growth rates of capital government spending outturn.</i></p> <p>The series spans the period from 1995Q2–2011Q4.</p>
	<p>Definition:</p>
	<p>Units: Ratio</p>

Symbol	Name and description
	Statistical Reports of the Ministry of Finance, Republic of Croatia available at the Ministry of Finance Official Web Page, and Ministry of Finance. Official gazette's following numbers: NN 98/1994, 9/1996, 111/1996, 141/1997, 167/1998, 33/2000, 130/2000, 116/2001, 154/2002, 31/2004, 171/2004, 148/2005, 137/2006, 28/2008, 149/2008, 151/2010 and 140/2011. Author's estimation.

The exogenous elasticities of a budgetary item with respect to output are obtained as product of the elasticity of the budgetary item to its macroeconomic base and the elasticity of this base with respect to output. If the elasticity of a budgetary item is constructed as an average value of two or more sub-components' elasticities, then their respective shares in the budgetary item's volume are used as weights. To sum up, the tax elasticity to output is:

$$\alpha_y^r = \sum_{i=1}^n \alpha_{B_i}^{\tau_i} \cdot \alpha_y^{B_i} \cdot \frac{T_i}{T}. \tag{B1}$$

Table B1 shows the elasticities of different tax components to their respective macrobase as well as the elasticity of the latter to output, plus the shares of tax components in total tax revenues. Similarly, table B2 reports the sub-elasticities used to estimate the overall elasticity of taxes with respect to private consumption and private investment.

**TABLE B1**  
*Exogenous sub-elasticities with respect to real GDP and share of tax item in total taxes (baseline model)*

Budgetary item	Elasticity of budgetary item to "macrobase"	Elasticity of "macrobase" to real GDP	Elasticity of budgetary item w.r.t. real GDP	Share in total taxes
	$\alpha_{B_i}^{\tau_i}$	$\alpha_y^{B_i}$	$\alpha_{B_i}^{\tau_i} \cdot \alpha_y^{B_i}$	$T_i / T$
Personal income tax	1.77	0.49	0.87	0.126
Corporate income tax	3.62	0.33	1.19	0.048
Social security contributions	0.68	0.49	0.33	0.357
Indirect taxes	1.53	0.89	1.36	0.468

*Note: For details on the respective "macrobase" (macroeconomic base) see for instance Bouthevillain et al. (2001).*

*Source: Author's calculation.*

TABLE B2

*Exogenous sub-elasticities with respect to private consumption and investment*

Budgetary item	Elasticity of “macrobase” to private consumption	Elasticity of “macrobase” to investment	Elasticity of budgetary item w.r.t. private consumption	Elasticity of budgetary item w.r.t. investment
	$a_C^{B_i}$	$a_I^{B_i}$	$\alpha_{B_i}^{\tau_i} \cdot a_C^{B_i}$	$\alpha_{B_i}^{\tau_i} \cdot a_I^{B_i}$
Personal income tax	0.21	0.27	0.37	0.48
Corporate income tax	0.14	0.19	0.51	0.69
Social security contributions	0.21	0.27	0.14	0.18
Indirect taxes	–	0.46	1.53	0.70

Note: For details on respective “macrobase” (macroeconomic base) see for instance Bouthevillain et al. (2001). All coefficients are significant at least at the 5% level.

Source: Author’s calculation.

The overall elasticities are presented in table B3. It is important to note that the overall total tax elasticity is 0.93, but since the fiscal variable regarding government revenues used in the analysis is constructed following the assumptions of Blanchard and Perotti (2002), i.e. net of transfers, it is corrected by the elasticity of unemployment related expenditures to output weighted by the share of this expenditure in total government expenditure<sup>33</sup>.

TABLE B3

*Exogenous elasticities with respect to output*

Budgetary item	w.r.t. real output	w.r.t. private consumption	w.r.t. private investment
	$\alpha_y^r$	$\alpha_c^r$	$\alpha_I^r$
Net taxes	0.92	0.84	0.49
Direct taxes	0.53	0.23	0.29
Indirect taxes	1.36	1.53	0.70
Government spending	0	0	0
Government spending for purchases	0	0	0
Government spending for wages	0	0	0
Government capital spending	0	0	0

Source: Author’s calculation regarding taxes and its components, and Perotti (2002) regarding spending and its components.

<sup>33</sup> Following Grdović Gnip (2011) the output elasticity of unemployment-related expenditures is -0.58, and these expenditures amount to 0.85% of total central government expenditures, which allows for a -0.01 correction of the total tax elasticity, to obtain the output elasticity of net taxes.

SVAR APPROACH

Alternative SVAR models represent a four-variable VAR model extended for an output component  $y_t^i$ , i.e. private investment or private consumption, placed third in the system<sup>34</sup>. Having four endogenous variables in the system means 22 restrictions in order to have the just-identified SVAR model:

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ -\alpha_g^y & 1 & 0 & -\alpha_r^y \\ -\alpha_g^{y^i} & -\alpha_y^{y^i} & 1 & -\alpha_r^{y^i} \\ 0 & -0.92 & -\alpha_{y^i}^r & 1 \end{bmatrix} \begin{bmatrix} u_t^g \\ u_t^y \\ u_t^{y^i} \\ u_t^r \end{bmatrix} = \begin{bmatrix} \beta_g^g & 0 & 0 & \beta_r^g \\ 0 & \beta_y^y & 0 & 0 \\ 0 & 0 & \beta_{y^i}^{y^i} & 0 \\ \beta_g^r & 0 & 0 & \beta_r^r \end{bmatrix} \begin{bmatrix} v_t^g \\ v_t^y \\ v_t^{y^i} \\ v_t^r \end{bmatrix} \tag{C1}$$

Equation (C1) shows the matrix representation of an alternative SVAR model with 20 restrictions out of the total needed 22. One more restriction comes out from the tax shock equation, since, in order to be able to formulate cyclically adjusted taxes, there is need for another exogenous elasticity, i.e. the elasticity of taxes with respect to the GDP component in question ( $\alpha_{y^i}^r$ ). These elasticities are shown in table B3,  $\alpha_c^i$  being the elasticity with respect to private consumption and  $\alpha_r^i$  the elasticity with respect to private investment.

The last restriction again comes out of the assumption whether government decides first on taxes or spending. Since the results proved to be robust in the baseline model under the assumption that spending comes first in the Croatian case, all alternative models are in line with that choice and therefore again  $\beta_r^g = 0$ .

For example, the just-identified SVAR model extended for private consumption would be the following:

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ -\alpha_g^y & 1 & 0 & -\alpha_r^y \\ -\alpha_g^{y^i} & -\alpha_y^{y^i} & 1 & -\alpha_r^{y^i} \\ 0 & -0.92 & -0.84 & 1 \end{bmatrix} \begin{bmatrix} u_t^g \\ u_t^y \\ u_t^{y^i} \\ u_t^r \end{bmatrix} = \begin{bmatrix} \beta_g^g & 0 & 0 & 0 \\ 0 & \beta_y^y & 0 & 0 \\ 0 & 0 & \beta_{y^i}^{y^i} & 0 \\ \beta_g^r & 0 & 0 & \beta_r^r \end{bmatrix} \begin{bmatrix} v_t^g \\ v_t^y \\ v_t^{y^i} \\ v_t^r \end{bmatrix} \tag{C2}$$

In the case when the effects of a particular sending component, like government expenditure for wages for instance, are under investigation, then the latter replaces the (total) government spending in the model ordered first.

<sup>34</sup> Recall Caldara and Kamps (2008) for a detailed insight into assumptions behind such ordering.

## STVAR APPROACH

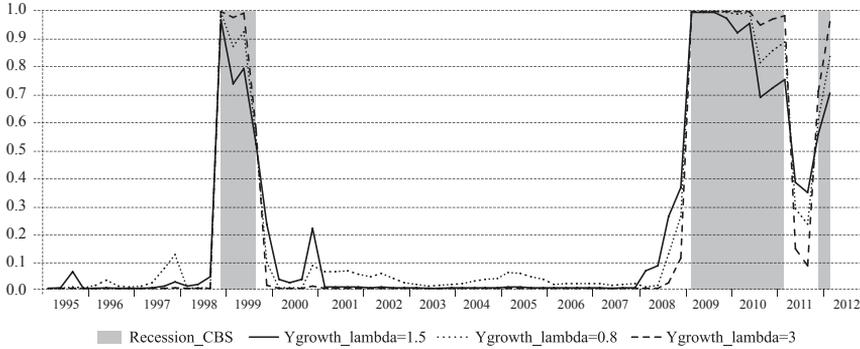
Alternative STVAR models represent a five-variable model (since in the baseline specification in comparison with SVAR models there is already an extra variable, i.e. the unanticipated component of the fiscal instrument) extended again for an output component  $y_t^i$ . If we again consider the example of the extended model for private consumption, then the response of the latter after a government spending shock would be an extension of equation (24) in the following way:

$$\begin{aligned}
 c_{t+h} = & (1 - F(z_t))\Theta_{E,h}FE_t^g + F(z_t)\Theta_{R,h}FE_t^g \\
 & + (1 - F(z_t))\Phi_{E,h}(L)g_{t-1} + F(z_t)\Phi_{R,h}(L)g_{t-1} \\
 & + (1 - F(z_t))\Psi_{E,h}(L)y_{t-1} + F(z_t)\Psi_{R,h}(L)y_{t-1} \\
 & + (1 - F(z_t))\Sigma_{E,h}(L)c_{t-1} + F(z_t)\Sigma_{R,h}(L)c_{t-1} \\
 & + (1 - F(z_t))\Gamma_{E,h}(L)r_{t-1} + F(z_t)\Gamma_{R,h}(L)r_{t-1} + u_t
 \end{aligned} \tag{C3}$$

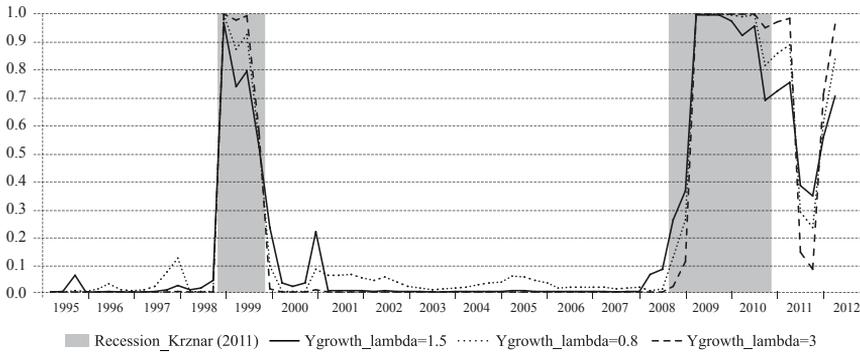
FIGURE D1

Smooth transition function  $F(z_t)$  with different values for  $\lambda$

(a) Recession periods according to CBS



(b) Recession periods according to Krznar (2011)

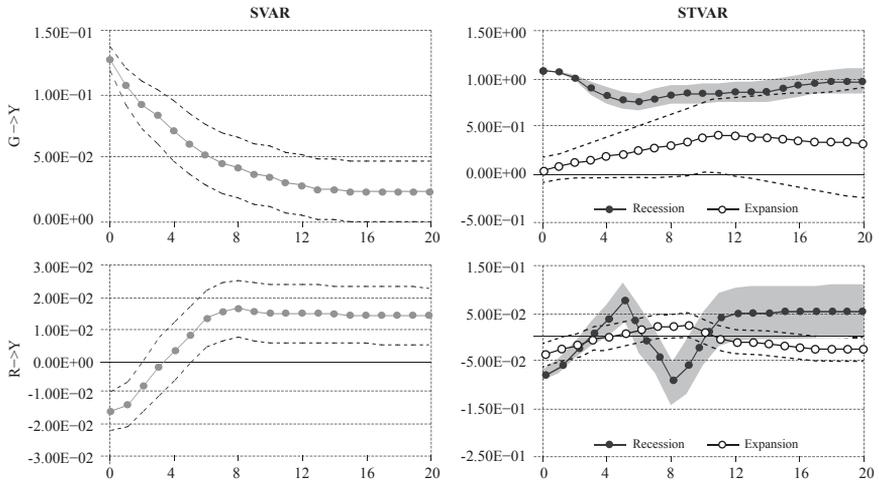


Notes: On both figures the grey surface corresponds to recession periods. However, in panel (a) these periods correspond to the occurrence of two or more consecutive periods (quarters) of negative real GDP, while panel (b) shows recession periods as identified in Krznar (2011). It is important to point out that in the latter case the last observation used in the estimation was 2010Q4.

Source: Author's estimation.

FIGURE E1

Impulse responses of output after a spending and tax shock

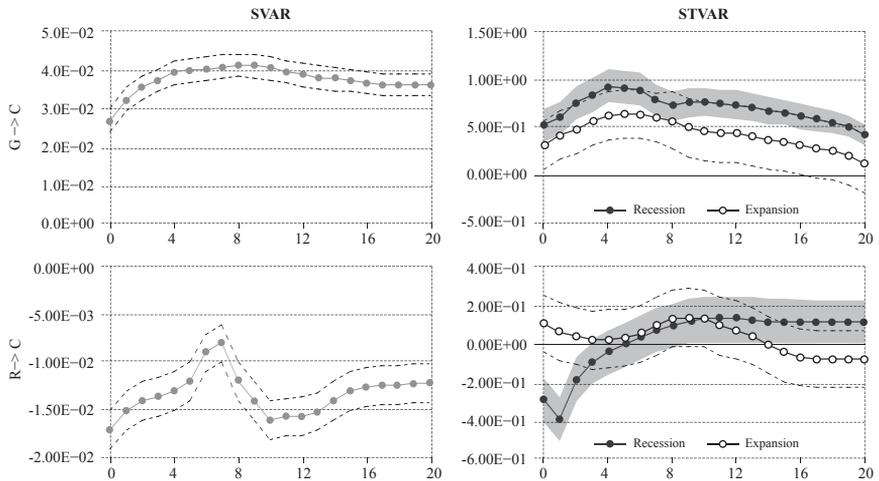


Note: SVAR panels – dashed lines show 95% confidence intervals. STVAR panels – grey shadow area shows 95% confidence intervals in case of recession IRF, while dashed lines the same in case of expansion IRF.

Source: Author's estimation.

FIGURE E2

Impulse responses of private consumption after a spending and tax shock

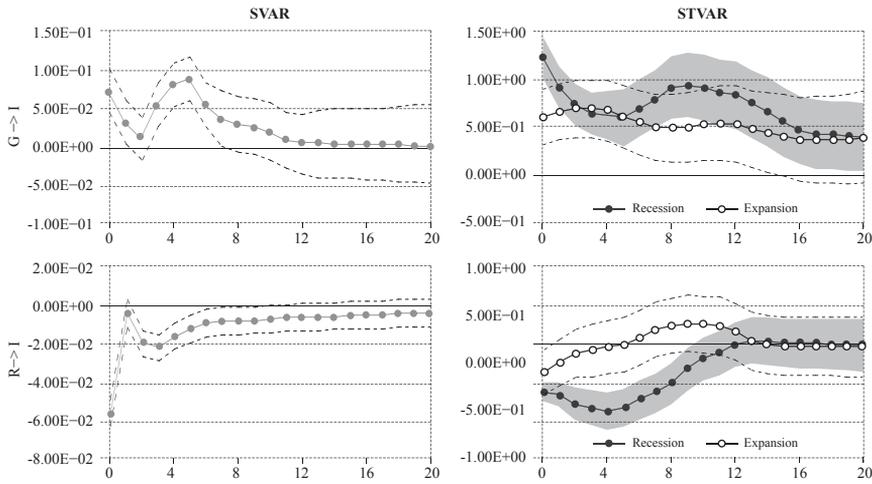


Note: SVAR panels – dashed lines show 95% confidence intervals. STVAR panels – grey shadow area shows 95% confidence intervals in case of recession IRF, while dashed lines the same in case of expansion IRF.

Source: Author's estimation.

**FIGURE E3**

*Impulse responses of private investment after a spending and tax shock*

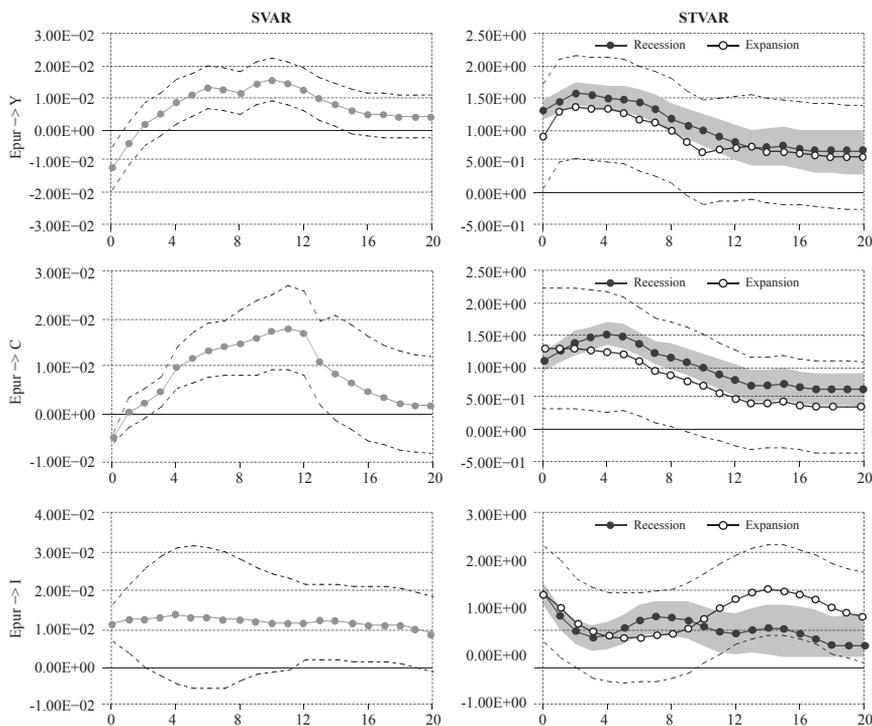


*Note: SVAR panels – dashed lines show 95% confidence intervals. STVAR panels – grey shadow area shows 95% confidence intervals in case of recession IRF, while dashed lines the same in case of expansion IRF.*

*Source: Author's estimation.*

FIGURE E4

Impulse responses of output, private consumption and private investment, after a shock in government spending for purchases of goods and services

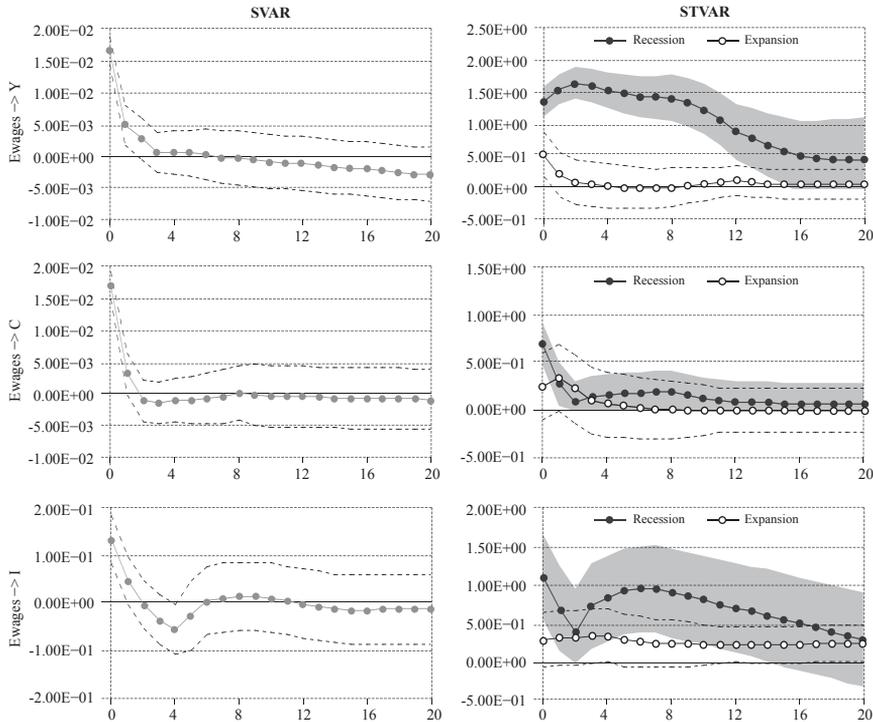


Note: SVAR panels – dashed lines show 95% confidence intervals. STVAR panels – grey shadow area shows 95% confidence intervals in case of recession IRF, while dashed lines the same in case of expansion IRF.

Source: Author's estimation.

**FIGURE E5**

*Impulse responses of output, private consumption and private investment, after a shock in government spending for wages*

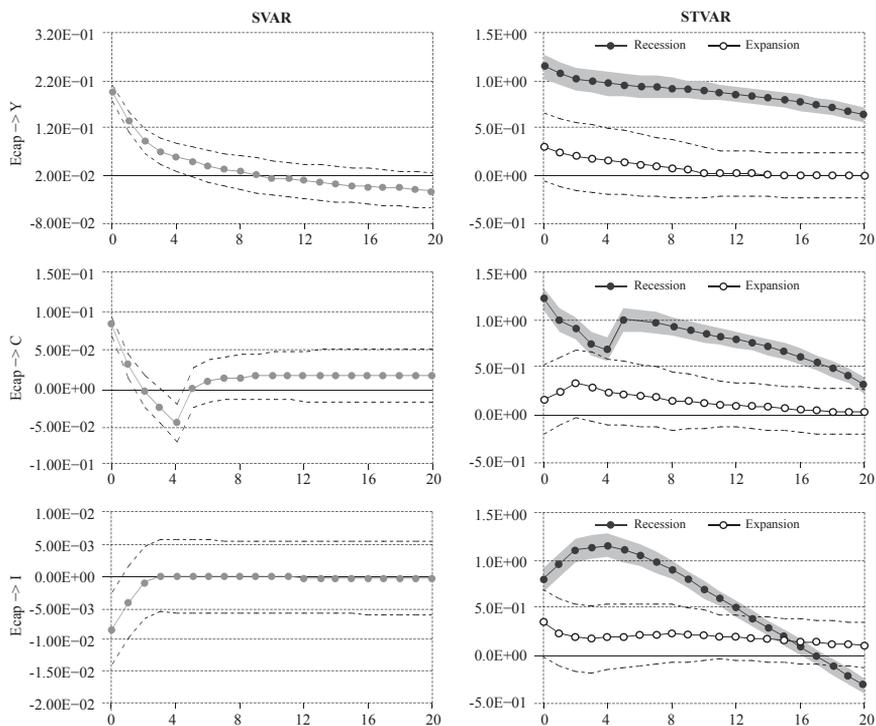


*Note: SVAR panels – dashed lines show 95% confidence intervals. STVAR panels – grey shadow area shows 95% confidence intervals in case of recession IRF, while dashed lines the same in case of expansion IRF.*

*Source: Author's estimation.*

FIGURE E6

Impulse responses of output, private consumption and private investment, after a shock in capital government spending



Note: SVAR panels – dashed lines show 95% confidence intervals. STVAR panels – grey shadow area shows 95% confidence intervals in case of recession IRF, while dashed lines the same in case of expansion IRF.

Source: Author's estimation.

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# The history of double tax conventions in Croatia

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## Abstract

*After a short introduction, the authors briefly describe the national experience in handling the problems of international double taxation through double tax conventions. This chapter is divided according to stages in the history of double tax conventions identified. The authors analyse the goals of tax treaty policies in differentiated stages with a survey of the economic implications. Special focus is placed on inter-country influences and the impact on and of international institutions and organisations through an examination of the influence of bilateral tax treaties on model tax conventions and vice versa. The fifth chapter presents concluding observations.*

*Key words: double tax conventions, history, Croatia, model tax convention*

## 1 INTRODUCTION

Entrepreneurial cross-border operations often give rise to the incurrance of double taxation. Therefore, more than a century ago some governments resorted to signing bilateral conventions in an attempt to eliminate this obstacle for doing business abroad. In 1889, the first international conventions on avoiding of double taxation (double taxation convention(s), hereinafter: DTC, DTCs) were concluded “in what is now Germany, as treaties between certain component states of Prussia. The first bilateral DTA<sup>1</sup> was entered into by Prussia and Austria in 1899. A DTA was concluded between Hungary and Austria in 1909. However, few DTAs were entered into from then until the 1920s, when after World War I Germany embarked upon forming a number of DTAs with its neighbours. Also, at that time the League of Nations began investigating the problems of juridical double taxation, in response to an appeal by the 1920 Brussels International Financial Conference. In 1923 a Report on Double Taxation, prepared by an eminent group of fiscal economists at that time, was submitted to a League’s Economic and Financial Committee. That report formed the bases of the first draft model DTA, published in 1928” (Holmes, 2007:56). It is possible to define a few stages in the history of the first tax treaties: from the very beginning until World War I, treaties between World War I and World War II (treaties in the League of Nations days), and treaty practice from the establishment of the OECD until 1963.<sup>2</sup> After that, the modern period in the history of the tax treaties follows, marked by developments within the OECD.

This paper is based on the national report intended to provide an insight into the history of the Croatian DTA system at the conference “The History of Double Tax Conventions”, held from 3 to 5 July, 2008, in Rust, Austria. The aim of the paper is to present Croatia’s double tax treaty policy through the analysis of its changes from the foundation of the new state to the present time, with some remarks and observations considering that policy in the former Yugoslavia. The paper consists

<sup>1</sup>The quoted author uses the term “double taxation agreement”, abbreviated as “DTA”.

<sup>2</sup>See more in: Freiherr von Roenne (2011:17).

of five parts, the first and fifth being Introduction and Conclusion. The second part, entitled National experience, is the longest. It comprises three subparts. The first extensively explores the periods and goals of Croatian tax treaty policy, the second explains briefly the economic implications of the said policy, and the third deals with a double taxation specific, important for its juridical and economic consequences, issue – unilateral measures for the avoidance of double taxation. The third part examines influences that other countries have had on Croatia's double tax treaty policy, and the fourth part analyses, through three subparts, the impact on and of international institutions and organisations. That impact is visible through the influence of the model conventions, most notably of the OECD Model Convention.

The subject of double tax treaties, even when limited to only one country, is still very broad one. An analysis of Croatia's double tax treaties network alone would require a book; therefore, those topics exceed the limits of the task the authors defined for their research in this paper. We consider it a good starting point, a sort of introduction for a more extensive future research.

## 2 NATIONAL EXPERIENCE

### 2.1 PERIODS AND GOALS OF TAX TREATY POLICIES

Broadly speaking, one can make the following categorisation of DTCs and the history of DTCs in Croatia. In chronological sequence, the first category comprises those international treaties that were concluded by the former Yugoslavian Republic (hereinafter: the former SFRY)<sup>3</sup> and which remain in force in the Republic of Croatia on the basis of the state's succession. A second category of DTCs consists of a group of international treaties ratified or acceded to by the Republic of Croatia following its declaration of independence in 1991.

Taking the content of the DTCs into account, it is possible to differentiate between two developmental stages which in fact fully fit the division into the two periods, the DTCs concluded by the former SFRY and the DTCs concluded by Croatia after 1991. Here the essential difference is in the choice of method for the elimination of double taxation. In the majority of new agreements one finds the ordinary credit method, whereas in the old agreements concluded by the former SFRY the most used method is the exemption system with progression.<sup>4</sup> Stagnation is obvious in the early 1990s but this was due to the war and thus requires no specific analysis or treatment for the purposes of this report.

#### 2.1.1 Period until 1991

After gaining independence, the Republic of Croatia assumed their obligation to apply all international agreements concluded by the former SFRY provided that

<sup>3</sup> The acronym SFRY stands for: the Socialist Federative Republic of Yugoslavia, which was the official name of the country (in English).

<sup>4</sup> See more *infra* chapter 3.

they do not conflict with the fundamental principles of the new state system. On the basis that there are currently only four such DTCs which were in force in Croatia, including:

- The convention between The Republic of Finland and The Socialist Federal Republic of Yugoslavia for the Avoidance of Double Taxation with Respect to Taxes on Income and on Capital;
- The convention between the Kingdom of Norway and the Socialist Federal Republic of Yugoslavia for the Avoidance of Double Taxation with Respect to Taxes on Income and on Capital;
- The convention between the United Kingdom of Great Britain and Northern Ireland and the Socialist Federal Republic of Yugoslavia for the Avoidance of Double Taxation with Respect to Taxes on Income; and
- The convention between the Kingdom of Sweden and the Socialist Federal Republic of Yugoslavia for the Avoidance of Double Taxation with Respect to Taxes on Income and on Capital.<sup>5</sup>

As already pointed out, these old agreements, as a rule, employ the exemption system with progression, rather than the ordinary credit method – which will become the main feature of the DTCs of the next period.

### 2.1.2 Period from 1991 onwards

After Croatia gained its independence several years passed before the first DTC was concluded. The first DTCs that Croatia concluded as an independent state date back to 1995 and include three countries: Albania, Macedonia and Poland.<sup>6</sup>

These are:

- The agreement between the Republic of Croatia and the Republic of Poland for the Avoidance of Double Taxation with Respect to Taxes on Income and on Capital;
- The agreement between the Republic of Croatia and the Republic of Macedonia for the Avoidance of Double Taxation with Respect to Taxes on Income and on Capital; and
- The agreement between the Republic of Croatia and the Republic of Albania for the Avoidance of Double Taxation with Respect to Taxes on Income and on Capital.

They are all published in the Official Gazette of the Republic of Croatia “Narodne novine – Međunarodni ugovori” (hereinafter: NN MU, 13/95), and the former two have been in force since 1 January 1997, while the third has been in force since 1 January 1998.

<sup>5</sup> These agreements were published in the Official Gazette of the former Yugoslavian Republic (“Službeni list – međunarodni ugovori”) and the obligation to apply them is assumed by the Republic of Croatia as of 8 October 1991, the Official Gazette of the Republic of Croatia, where the international agreements are published – “Narodne novine – međunarodni ugovori”, hereinafter: NN MU, 53/91.

<sup>6</sup> There is no special reason that we can propound as a key factor for the conclusion of DTCs with these countries and not with some others.

Subsequently, procedures were initiated to conclude new DTCs and 33 such agreements were in force in Croatia by 2008. Almost 20 DTCs have been concluded since that period, because today we have 57 DTCs in force. Throughout 1996 agreements with Romania, Russian Federation and Slovakia were concluded. Agreements with Greece, South Africa, Hungary and Ukraine were concluded in 1997, while only one agreement was entered into in 1998, the one with Bulgaria. From the end of 1990s onwards the preponderant part of the agreements had been concluded. Thus, in 1999 DTCs were concluded with the Czech Republic, Canada, Malta, Switzerland and Turkey. The same number of agreements was concluded in 2001 with Austria, China, Latvia, Lithuania and Netherlands. A fruitful year in 2003 brought about agreements with Belgium, Estonia, Ireland, Yugoslavia, Malaysia and Mauritius. In 2004 agreements were entered into with Belarus, Chile and France and in 2005 with San Marino and Slovenia. This brief timeline shows that the most efficient period for the conclusion of DTCs was the end of the 1990s and early 2000s. This is not at all surprising bearing in mind that the country was at war for the first half of 1990s and the immediate post-war period was primarily devoted to the recovery of Croatia's social and political life.

As mentioned before, the first "new" DTCs were concluded in 1995. The procedure of concluding international agreements then was prescribed by the Conclusion and Implementation of International Agreements Act in force as of 1991 (NN MU 53/91 and 93/91). The 1996 Conclusion and Implementation of International Agreements Act (hereinafter: the International Agreements Act – NN MU 28/96), which replaced the 1991 Act and is still in force today, brought no changes in the procedure that is briefly described below.

Competences for the conclusion of international agreements in Croatia depend on the nature and contents of the international agreement and are divided among the Croatian Parliament, the President of the Republic of Croatia and the Government of the Republic of Croatia. International agreements that call for the enactment or amendment of domestic law, international agreements of a military and political nature, and international agreements that financially oblige the Republic of Croatia are subject to ratification by the Croatian Parliament.

International agreements concluded and ratified in accordance with the Constitution and made public, and which are in force, are part of the internal legal order of the Republic of Croatia and are above the law in terms of legal effects. That is the case with DTCs, meaning that no other entity in Croatia, private or official, is a necessary participant in the procedure for negotiation and concluding DTCs. Basic rules that lay down the framework for concluding DTCs are the previously mentioned International Agreements Act along with other relevant sources of international law. This Act provides for several stages for the conclusion of DTCs. Article 7 vests the right to commence the procedure for concluding international treaties in the President of the Republic of Croatia as well as the Croatian

Government. In fact, this is the role assumed by the Ministry of Finance. In order to continue with a decision this procedure must contain a draft agreement, a list of members of delegation, a proposal on the authorised members of delegation and so on. The negotiation process is prescribed in Articles 8-14. In the negotiation itself the Republic of Croatia is represented by the delegation determined by the President of the Republic or the Government. The appointed delegation must follow the basic negotiating positions for conducting the negotiations. An authorised member of the delegation may sign a treaty which must thereafter be consistent with the formed negotiating positions. The process of treaty ratification is prescribed in Articles 15-24. The signed treaty has to be submitted for ratification within a 15-day period, and the process of treaty ratification is instituted by the Government by way of a Ministry of Foreign Affairs initiative. The Parliament ratifies the treaties. The process of ratification is laid down in Articles 25-26. The other stages of the procedure – entry into force, publication in the Official Gazette as well as registering, archiving, executing, implementing, amending and terminating the treaty – are also prescribed by same Act.

### 2.1.3 Croatian model double tax convention

All DTCs concluded by the Republic of Croatia are based on the Croatian Draft Agreement on the Avoidance of Double Taxation (hereinafter: the Croatian MC). This Draft is in compliance with the model agreement provided by the OECD (2003 – hereinafter: the OECD MC). The majority of concluded agreements cover taxes on income and on capital – all taxes imposed on total income, on total capital, or on elements of income or of capital, including taxes on capital appreciation and taxes on gains from the alienation of movable or immovable property, as well as taxes on the total amounts of wages or salaries paid by enterprises. Croatia never concluded a DTC that covers inheritance and gift taxation. The majority of agreements in force in Croatia cover the field of income and property as compared with those agreements which only cover income.

The Croatian MC is not publicly available.<sup>7</sup> All the Croatian DTCs that have been concluded to date are based on this model; it serves as the Croatian starting position in negotiations and as informal guidelines for the employees of the Ministry of Finance when negotiating new tax treaties. Since it is not publicly available, there has been no public discussion regarding its contents.<sup>8</sup> It should be noted, nevertheless, that the absence of a public discussion is not due to its concealed

<sup>7</sup> The authors were able to examine it only after they had formally requested it and upon the Ministry of Finance's approval.

<sup>8</sup> There is a (less public) discussion regarding the conclusion of DTCs. This discussion relates to the selection of countries with which a certain DTC will be concluded and the way in which the negotiation process is expedited but not the content of the DTC. For instance, such a discussion was held in the Croatian Parliament before the DTC with Slovenia was concluded. Unfortunately, this form of discussion does not include real public debate. In the case of DTCs there is no debate to include the state bodies applying the laws (and the DTCs), non-governmental organisations, interest groups and individual taxpayers. This, in fact, means that all these stakeholders have the right to express their opinions and present proposals but they cannot exercise their rights, although they should be interested in involving themselves in the preparation of drafts of statutes and of DTCs that concern the interests they represent and protect.

contents, but rather to a general lack of interest in international double taxation issues. This lack of interest is notable not only in general public, which may be understandable, but also in the circles of tax law practitioners and scholars. Had there been any general or expert interest in double taxation issues, the contents of the Croatian MC would have certainly come to the fore. Considering the present state of affairs, the only discussion concerning the Croatian MC is the one confined to a narrow circle of experts of the Ministry of Finance, consequently lacking potentially valuable independent inputs.

The Croatian MC has existed since the mid-1990s.<sup>9</sup> In the past decade, the national MC was revised several times and there are now several versions of it.<sup>10</sup> Regarding Croatia's DTC policy, it is not possible to isolate specific factors which brought about changes in it. Indeed, the changes themselves have had no meaningful impact. Certainly, international relations, trade and political situations always influence all aspects of international negotiations. Besides, Croatia's preparations for EU membership set demands on Croatian policy to have it brought in line with that of the EU. This having been said, in the field of DTCs no special requirements are discernible.

#### **2.1.4 Comparison of the tax treaty policies in the former SFRY and Croatia**

DTC policy is understood as an instrument for achieving economic goals. By concluding DTCs, a country attempts to integrate itself more easily into the international exchange of goods, services and capital as well as to improve its economic position. Although the former Yugoslavia was a socialist country, economic considerations largely influenced and determined the country's DTC policy. This policy was founded upon the concepts of the OECD Model (OECD, 2003). Furthermore, it was recognised that DTCs between Western and socialist countries were of great importance as instruments of economic cooperation (Debatin, 1985:132). The former Yugoslavia wanted to avoid the problem of double taxation by concluding DTCs with countries interested in improving mutual economic relations. By adopting the 1990 Constitution, Croatia changed its political system to a democratic parliamentary republic. This change coincided with the early stages of preparation for the status of candidate country and membership in the European Union, the Union being its most important trading partner. Certainly, these circumstances brought about changes in the country's DTCs policy and one of the factors was the change in the method for avoidance of international double taxation which is included in the new treaties. These "new" treaties that Croatia concluded as an independent state abandon the exemption method and provide for the credit method (i.e. the ordinary credit method) in the variety of ordinary credit.

<sup>9</sup> Unofficial data from the Ministry of Finance.

<sup>10</sup> The first version dates back to 1995. The last changes were a result of the new versions of the national MC – February 2000, October 2000, and July 2001.

Croatia's economy has undergone a profound transformation since the country gained its independence. The achievements were accelerated by the transformation and opening of Croatia to global markets through the WTO<sup>11</sup> and the CEFTA memberships, cooperation with the Southeast European neighbours and, especially, the signing of the Stabilisation and Association Agreement with the EU. Croatia has gone a long way in liberalising its trade, having signed more than 35 free trade agreements.<sup>12</sup> The economic success formula of the EU accession countries has shown that there was a need for a much more intensive adoption of the progressive (market-based) institutions and policies. Applying this conclusion to the circumstances in Croatia it may be said that there was and still is room for further liberalisation of trade and changes in the economy. The economically significant period of Croatian development started at the end of the 1990s when the majority of agreements that are part of the "economic field" were signed.<sup>13</sup> Before that, at the time when the first DTCs were concluded (in 1995) it became apparent that Croatia's economy was a post-socialist one. The country was faced with various problems related to the creation of an appropriate policy for the development and growth of its economy. The gradual increase in competitiveness on the world market and export growth was signs of success in the process of restructuring. The problems related to the fact that it was a post-war period and at the same time a period of the systemic transformation as the transition from the former socialist centrally planned system to the open market economy. This means that the systemic transformation is not only a complex pragmatic, but also an evolutionary process.<sup>14</sup>

There are no trade-specific provisions in the DTCs that apply to Croatia. Although the Croatian policy on the conclusion of DTCs is largely in line with the basic principles laid down in the OECD Model Double Taxation Convention, there are several special objectives that Croatia strives to meet when concluding tax conventions. Croatia is a country with a small domestic market but a relatively large foreign market. As a consequence, a relatively large number of entrepreneurs operate primarily on an international basis. The country has built an open economy and its policy on DTCs reflects this situation, especially when it comes to its relationship with the EU. Croatia's DTC policy is in line with the goal of removing obstacles to the international flows of goods and capital.<sup>15</sup> In compliance with the

<sup>11</sup> Croatia became a WTO member (No. 140) on 30 November 2000.

<sup>12</sup> Free Trade Agreement between the EFTA states and Croatia was signed in Vaduz, Liechtenstein, on 21 June 2001.

<sup>13</sup> The Free Trade Agreement (hereinafter: the FTA) with the EU-27 – in force as of 1 January 2002 (in force in the 10 new EU member states since 2004 and in Romania and Bulgaria since 2007), the FTA with the EFTA states (in force as of 2002), the FTA with the CEFTA states 2006 – Croatia, Albania, Bosnia and Herzegovina, Montenegro, Kosovo, Macedonia, Moldova and Serbia – in force as of 2007, and the FTA with Turkey in force as of 2003.

<sup>14</sup> "(...) since it is not only the political, the economic, the legal, and the social order which have to be accounted for by transformation policy, but also historical legacies as well as informal institutions such as norms, conventions, and ethical rules which inevitably lead to path dependence of societal development (...)" see, Ahrens (2006).

<sup>15</sup> Such a policy did not result in expected, inter alia, foreign investments, but the goal of removing obstacles to the flows of goods and capital was accomplished. Thus, it is possible to conclude that this policy was to

principles of residence country taxation, the Croatian Profit Tax Act provides, to some extent, capital import neutrality.<sup>16</sup>

While the economic background serves as a somewhat important impulse for concluding new agreements, it has not produced a change in the policy. Trade and economic relations with neighbouring countries and the EU certainly influenced the conclusion of new international treaties in general. In that respect, the DTCs were concluded primarily with countries which are important trade partners of Croatia or its neighbours.

Although the initiative was primarily in the hands of the Ministry of Finance, there are some signs of the influence of several other groups in initiating the conclusion process of certain DTCs. The main influence on negotiations of the DTCs or even an initiative to commence those negotiations comes primarily from the Government<sup>17</sup> or the President of Republic. It seems, however, important to mention certain attempts from the strongest trade association – namely the Croatian Chamber of Economy. Likewise, some “pressure” coupled with concrete demands came from personally interested tax payers.<sup>18</sup>

The predominant influence on Croatian DTC policy was, and still is, executed by the Ministry of Finance. Since the DTCs are highly specialized legal documents, requiring a profound knowledge of both domestic and international tax law, it rarely (if ever) gets in the politicians’ area of interest; therefore it is left to the Ministry’s experts. For example, there was only once a discussion in the Croatian Parliament on a DTC, that with Slovenia (the discussion tackled the issue of cross-border workers’ taxation). Business conditions were not the issue, except as a general observation that international double taxation is an obstacle to doing business and that, as such, it should be prevented through DTCs. The situation has not changed over the years; there is no sign that the problem of double taxation has come to the attention of the business community, at least in the sense of its readiness to act, i.e. to propose and advocate solutions that would enhance its position in cross-border business activities. Clear indicators of such a state are the contents of the Croatian periodicals dealing, in principle, with the technical aspects of practical issues of interest for the business community (e.g. managerial finance in

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some extent successful.

<sup>16</sup> See *Zakon o porezu na dobit* (NN 177/04, 90/05, 57/26) came into force on 1 June 2006, applicable since 1 January 2007, Article 30 regarding crediting foreign tax. Article 30 reads: “(1) If a taxpayer has derived an income or profit abroad (directly or through its permanent establishment) and paid the profit tax or a tax of the same kind, the tax paid abroad may be credited against the domestic tax up to the amount of the profit tax which would be payable on such profit or revenue in Croatia. (2) The amount of the profit tax referred to in Paragraph (1) of this Article shall be assessed by applying a crediting rate to the profit or revenue derived abroad. The crediting rate shall be determined as the ratio between the total tax liability before the additional reductions in the tax base and the total profit solely derived in Croatia. (3) For the purpose of crediting the foreign tax paid abroad, referred to in Paragraph (1) of this Article, the taxpayer shall provide the Tax Administration with the evidence of the tax payment abroad.”

<sup>17</sup> Special influence comes from Ministry of Foreign Affairs and European Integrations.

<sup>18</sup> Taxpayers applied “pressure” and demanded the conclusion of the DTC with Slovenia. These taxpayers were personally interested in this matter.

general, all aspects of accounting, taxes, social contributions, auditing).<sup>19</sup> While there were some articles in those periodicals dealing with certain international double taxation issues, it should be noted that those articles were written by the employees of the Ministry of Finance, rather than by, for example, interested businessmen, managers or lawyers working in the private sector. This reveals that the most relevant, and quite often the only relevant, entity deciding on double taxation policy was, at all times, the tax administration. This is especially noticeable from the lack of proof of influence exercised by any specific economic-political interest, i.e. of any pressure group intent on accomplishing some sort of specific goal. Accordingly, there is no evidence that changing business conditions play any role when Croatia is concluding a new DTC. One possible explanation could be that Croatia is a predominantly import-oriented country, not only the import of goods and services, but also the import of capital. This means that there are relatively few Croatian entrepreneurs engaged in business over the border, and hence exposed to double taxation. If the opposite were the case, the pressure from that part of the business community would presumably be much stronger. Furthermore, that pressure would, predictably, bear fruit since there is no known conflicting interest that would hinder such development. It could be further assumed that Croatian residents who encounter certain problems while doing business in foreign countries are satisfied with the unilateral measures available in those countries, and with the Croatian procedures resulting in the recognition of foreign taxes. On the other hand, there is no sign of the activity of foreign entrepreneurs carrying out business in Croatia, intended to amend the provisions of the Croatian DTCs. Their influence could be expected through the Croatian Chamber of Economy, the meeting point of the Croatian Government and domestic and foreign businesses, but such influence has not been exerted so far.<sup>20</sup>

Croatia is focused on concluding new DTCs rather than amending the existing ones. This could be explained by at least two factors. First, Croatia is a relatively new European country; as such, it has only started to build its network of international conventions, DTCs included. The main goal still is to establish the country's position in international relations, so the problems of DTC application, as rather legally sophisticated documents of no general interest and understanding, have not yet come to the fore. Second, and tightly allied with the previous factor, is the aforementioned lack of input from the private sector (individuals and legal entities) indicating problems caused by international double taxation. The absence of any reports on the problems or cases in which they arise, whether in periodicals or in official Ministry's releases and opinions, is a clear sign of this trend.

<sup>19</sup> Those are, e.g. *Financije i porezi, Računovodstvo i financije, Računovodstvo, revizija i financije*.

<sup>20</sup> Based on the statement of an employee of the Croatian Chamber of Economy, in a short conversation with the author (Hrvoje Arbutina) on 15 May 2008.

## 2.2 BACKGROUND: ECONOMIC IMPLICATIONS

The structure of the administrative division of Croatia is as follows. The territory of the Republic of Croatia is divided into the following administrative units: municipalities, towns and counties. Municipalities and towns are units of local self-government which carry out the affairs of local jurisdiction by which the needs of citizens are directly fulfilled, and in particular the affairs related to the organisation of localities and housing, area and urban planning, public utilities, child care, social welfare, primary health services, education and elementary schools, culture, physical education and sports, customer protection, protection and improvement of the environment, fire protection and civil defence. Counties are units of regional self-government which carry out affairs of regional significance, and in particular affairs related to education, the health service, area and urban planning, economic development, traffic and traffic infrastructure and the development of the educational network, health, social and cultural institutions. The capital city of Zagreb is attributed the status of a county.

Although local and regional governmental units have limited powers of taxation, the authority to stipulate all the basic features of all the taxes belongs to the Parliament. Local governments are entitled to determine taxes but within the limits of the acts passed by the Parliament. The Financing of Units of Local and Regional Self-Government Act states that local and regional governments are entitled to set taxes within the limits of the acts in force and lists all types of local and regional taxes, stipulating all elements of each tax (tax subject, taxable object, tax base, tax rate or other measure, exemptions and allowances). Consequently, it may be said that the state has exclusive jurisdiction to legislate on taxation issues. According to the Constitution of the Republic of Croatia, the international treaties signed, ratified, publicised and entered into in force are part of the internal legal order of the Republic of Croatia and produce legal effects that supersede those of Croatian statutes.<sup>21</sup> Bearing in mind the different solutions that each legal system adopts, it is important to emphasise this supra-statutory legal force guaranteed for ratified treaties (Rodin, 2002). That is also the case with the DTCs. As outlined and described above, the procedure shows that the authorities responsible for the mutual agreement procedure are similar but not identical to the DTC negotiators, since DTC negotiators include members from the Ministry of Finance.<sup>22</sup>

It is to be concluded that within the scheme of multilevel systems (state level, counties, municipalities and towns) which exists in Croatia the limitations envisaged in the respective DTCs apply to all levels, which is consistent with the OECD Model.

<sup>21</sup> The Constitution of the Republic of Croatia provides: Published treaties, the ratification of which has been accepted by the Parliament and which bind Croatia, are part of the legal system; if the treaty is different from statute, it is the treaty that must be applied (NN MU 41/01 and 55/01).

<sup>22</sup> See *supra* chapter 2.2.

Previous experience then provides no evidence of any coordination between the authorities responsible for negotiating and concluding international treaties in general, on the one hand, and DTC negotiators, on the other. The same conclusion is applicable in respect of the coordination between local tax offices and DTC negotiators, although local tax offices apply DTCs, thus being in the optimal position to indicate practical problems or possible disadvantages of the DTCs.

### 2.3 UNILATERAL MEASURES FOR AVOIDANCE OF DOUBLE TAXATION

Croatia prescribed unilateral measures in its tax system, enabling the avoidance of international double taxation even when a DTC has not been concluded. In fact, in the case of Croatia, one could hardly talk of measures (in plural), since there is an absolute prevalence of one measure – the ordinary credit method. It is included as a method for the avoidance of double taxation, both in the Income Tax Act (NN 177/04) (regulating the taxation of individuals) and in the Profit Tax Act (NN 177/04, 90/05, 57/06) (mostly regulating the taxation of legal entities, but also some categories of individual entrepreneurs).

Croatia's DTCs follow the credit method as it is formulated in Article 23B of the OECD MC, i.e. the ordinary credit method. Thus, they are in accordance with unilateral measures regulated by Croatian legislation. However, the possibility of applying the exemption with progression for income and capital exclusively taxable in the other contracting state has been included in the treaty with Switzerland.<sup>23</sup>

Since there are unilateral measures in the Croatian tax system, aiming at solving the double taxation issue, there is the question of the need for the DTCs. This need has, in fact, not been the object of research in Croatian tax literature, in either scientific or practice-oriented periodicals; rather, it can be said to have been taken for granted in Croatian expert tax writings. Explanations are to be looked for elsewhere, e.g. in the international expert tax literature. As already mentioned, subsequent to gaining independence, Croatia started to build own network of international conventions as an additional, and important, symbol of its recognition as an equal member of the international community; DTCs just suit the purpose of achieving this affirmation. Further, their conclusion represents a continuance of the practice begun in the former Yugoslavia, which concluded 22 DTCs in all. Croatia also considers this practice to be useful and beneficial for its own purposes. In the absence of reliable data, other and, from an expert point of view, perhaps more important reasons that a number of DTCs have actually been concluded by Croatia have to be derived from the literature. These reasons are embedded in the general functioning of the country's tax system: combating fiscal evasion and exchange of information on tax systems with the other contracting state

<sup>23</sup> Article 23 Paragraph 1c of the Agreement between Government of the Republic of Croatia and the Government of the Republic of Macedonia for the Avoidance of Double Taxation with Respect to Taxes on Income and on Capital (NN MU 13/95).

(country's point of view), and the application of the Non-Discrimination Article (taxpayer's point of view) (Baker, 1994:12). Furthermore, the DTCs are probably generally seen as a means of promoting investments from one country to another, and for removing "fiscal blocks to the movement of individuals between countries" (ibid:13) As for the former Yugoslavia, some views were expressed by a then high-ranking official of the former Yugoslavian Federal Ministry of Finance.<sup>24</sup> He explicitly stated that the purpose of DTCs was the complete protection of the taxpayer against double taxation while at the same time ensuring the following:

- preventing discrimination among taxpayers on an international basis;
- assuring legal and fiscal security of taxpayers;
- stimulating investment of foreign capital; and
- improving economic, scientific, cultural and recreational cooperation among the revenue bodies of the countries that have concluded a treaty (Arsić, 1985:142).

He also pointed out some other purposes of Yugoslav DTCs, such as tax treatment of dividends, particularly relevant for the purpose of attracting direct foreign investments (which was one of the officially proclaimed goals of the former SFRY economic policy). There were two problems: first, there were no dividends in the legal system of the former Yugoslavian Republic, so the returns the foreign investors realised through their investment in the former SFRY had to be characterised differently. Second, and more important, when a country in which a foreign investor was resident was taxing those returns, it only recognised the tax that was effectively paid in the former SFRY. This system overrode the effect of tax incentives that the former SFRY had envisaged at the time. This is a well known problem in international taxation, soluble by tax sparing credit; the former Yugoslavian Republic obviously (and quite understandably, bearing in mind her economic interest) wanted the tax sparing credit proviso to be built into her DTCs with developed countries.

Looking at the period in which Croatia has existed as an independent country, i.e. the past 22 years, there have been no changes in the relationship between unilateral measures and the DTCs. In other words, Croatia harmonised the "ordinary credit method approach", stipulated by Income Tax Act and Profit Tax Act as unilateral method, with the same approach present in its DTCs. However, given that some of the DTCs concluded by the former SFRY are still in force in Croatia<sup>25</sup>, they also need to be taken into consideration. Different to Croatian practice, DTCs of the former SFRY sometimes provided for exemption through the progression method as the *lex generalis* when it came to avoidance of double taxation

<sup>24</sup> We assume the views Mr. Arsić expressed in the quoted paper to be official ones (or at least the ones very close to official) since he, as the author of the paper is (1) mentioned as the official of the Federal Ministry of Finance, and (2) did not, in any way, mention that the views expressed in the paper are his, and not necessarily the ones of the Ministry of Finance.

<sup>25</sup> Those are DTCs with Norway, Sweden and the UK.

of income and of capital; the credit method, as the *lex specialis*, was provided for passive income (mostly dividends, but sometimes royalties and interest too). For instance, the DTC entered into between the SFRY and Norway,<sup>26</sup> still in force as part of the Croatian DTC network, envisages (Article 23, Paragraph 1c) exemption with progression as the method for the avoidance of double taxation to be applied by Yugoslavia at that time (now Croatia). The then Yugoslavia (and now Croatia) apply the credit method when taxing income from dividends and royalties (Articles 10 and 12) of Yugoslav (i.e. Croatian) residents derived in Norway. This means that, by way of the former Yugoslavian DTCs, there is the exemption with progression method in Croatian DTCs network. The tax sparing proviso is included in Article 23, Paragraph 2c of the DTC with Norway, and it only applies to situations where residents of Norway derive profit in respect of their participation in a joint venture with the Croatian (formerly Yugoslav) enterprise. The time limit for the application of this provision has been set at ten years, with the possibility of extension upon the agreement of the tax authorities of the contracting states.

The DTCs with Sweden<sup>27</sup> and the United Kingdom follow a similar pattern (Article 22 in both DTCs): Croatia (formerly Yugoslavia) applies the exemption with progression, except for dividends (the DTC with Sweden), interest and royalties (the DTC with the UK), for which the credit method was prescribed, while Sweden and the United Kingdom respectively opted for the credit method as a general rule.

There are exceptions to the described approach. For instance, Article 22 of the DTC between the SFRY and Finland,<sup>28</sup> in force in Croatia, provides that the credit method is to be used by both contracting states. The tax sparing credit proviso has been included in this DTC too (Article 22, Paragraph 4a), with a temporal clause (five years, with the possibility of extension upon the agreement of the contracting states tax authorities, Article 22, Paragraph 4b).

When comparing unilateral measures and DTC provisions, the main differences are: (1) the prevalence of the exemption with the progression method in the treaties concluded by the former SFRY and now in force in the Republic of Croatia on the basis of succession, and (2) the presence of the tax sparing credit proviso in the majority of those treaties. However, that proviso cannot be found in the DTCs which Croatia concluded as an independent state. It seems that the time for applying the tax sparing credit has expired, at least where European countries are concerned. This is the consequence of the broader trend of abandonment of the tax sparing credit. However, the existence of the tax sparing credit in the DTCs which are in force in Croatia on the basis of succession is worth noting.

<sup>26</sup> Published in Službeni list, MU 9/85, 53/91.

<sup>27</sup> Published in Službeni list, MU 7/81, 53/91.

<sup>28</sup> Published in Službeni list, MU 8/87, 53/91.

### 3 INTER-COUNTRY INFLUENCE

The negotiators on behalf of the former Yugoslavian Republic had a stronger, if not much stronger, negotiating position than their Croatian counterparts nowadays. Croatian negotiators are obviously not in a position to demand any substantial deviation of the OECD MC, while the negotiators of the former SFRY were able to achieve certain goals that had a significant economic impact on the former SFRY. This, of course, includes the tax sparing credit proviso which is incorporated into a number of the former Yugoslavian DTCs. This change in the negotiating position may be understood as a consequence of the decline of the state-planned socialism in Central and Eastern European countries (as well as the so-called self-governing socialism, in the case of Yugoslavia). The disappearance of the regime (the foundation of which constituted a firm and strong alliance between countries bound by the same political and economic system, notwithstanding, of course, the desirability and even necessity of changes) weakened, at the same time, the negotiating position of those countries on the international stage. Although formally not part of COMECON, and by many material accounts actually different to COMECON countries, the former SFRY benefited from the general state of affairs in the sense that it enjoyed similar treatment to those countries when it was negotiating the DTCs.<sup>29</sup>

During the transition to a market-oriented economy, when negotiating its DTCs, Croatia complied with the OECD MC. Since the OECD MC clearly represents the interests of developed countries, the conclusion can easily be that Croatia today generally complies with their conceptions. This is especially true since there is no specific interest (e.g. business, social or fiscal) articulated in the form of the Croatian negotiating position which would be firmly established or even non-negotiable.

Croatian DTCs are not all the same. It is sufficient to look at the table overview of these DTCs to establish this as a fact.<sup>30</sup> This overview contains, among other data, the rates on passive income, included in Croatian DTCs. It is obvious that there are different rates, fixed in different DTCs (e.g. 0, 5, 10 and 15 per cent for dividends), different percentages of shares in a company's share of capital required for the affiliation privilege to become applicable. In the course of the research, we were not able to establish the existence of a pattern for negotiating such provisions; neither geographical location nor the contracting states' degree of development provided an answer. Additionally, neither the time of publishing or entry into force of each individual DTC nor the information acquired from the Ministry of Finance can confirm any pattern.<sup>31</sup> Considering that Croatia follows the OECD

<sup>29</sup> However, this treatment was not as beneficial as the treatment which some other socialist and developing countries enjoyed; for more details, see: Debatin (1985:132).

<sup>30</sup> Available at: [[http://www.porezna-uprava.hr/hr\\_propisi/\\_layouts/in2.vuk.sp.propisi.intranet/propisi.aspx#id=gru598](http://www.porezna-uprava.hr/hr_propisi/_layouts/in2.vuk.sp.propisi.intranet/propisi.aspx#id=gru598)].

<sup>31</sup> Based on a short interview the author (Hrvoje Arbutina) had with an official of the Ministry of Finance, on 27 May 2008.

MC scheme, and lacking an explanation from the authoritative source, only a hypothesis could be put forward that those differences are the product of the influences which the other contracting party to these bilateral agreements exercised over Croatia during negotiations. However, this is probably true only in cases where those states have considerable experience in negotiating DTCs (e.g. Austria, Belgium, France, the United Kingdom). When it comes to less experienced partners (which are themselves new countries, or countries in transition, e.g. Bosnia and Herzegovina, Macedonia, Albania, Belarus, etc.), this explanation is not convincing. In those cases, recent experiences were drawn upon, together with the new knowledge which younger employees of the Ministry of Finance acquired at numerous expert seminars organised by the OECD, the EU, and the ministries of finance of developed countries.<sup>32</sup>

As for the former Yugoslavian DTCs, it is now virtually impossible to positively establish their background and negotiating environment, since no sources are available in Croatia, whether documents or persons. However, a certain pattern can be established that was in many ways similar, if not the same, for the former socialist countries. One of the features characteristic of this pattern was the prevalence of exemption with progression as the method for avoidance of double taxation. This was not only due to continental legal inheritance, in which the exemption method is generally and historically inherent; it was also in accordance with the socialist (governmentally supervised) structure of enterprises in the former SFRY – that is to say, since taxation of those entities could not have been compared with taxes imposed on Western enterprises, the credit method was often not applicable (Debatin, 1985:124).

The inclusion of the tax sparing credit proviso is another feature of the former Yugoslavian DTCs concluded with developed countries. A tax sparing credit is the means of attracting direct foreign investments by way of DTCs.<sup>33</sup>

Both these features could be construed as a consequence of certain influences which the former Yugoslavia did not itself designed, but willingly applied. This is especially true, of course, when it came to the application of the tax sparing credit.

<sup>32</sup> One of the authors (Hrvoje Arbutina) learned of these seminars while contacting some of the said employees in the course of the postgraduate study “Fiscal System and Fiscal Policy”, organized at the Faculty of Law, University in Zagreb, which began in 1995. All of the postgraduate students evaluated the knowledge acquired on the seminars as high and very usable in practice.

<sup>33</sup> “Term used to denote a special form of double taxation relief in tax treaties with developing countries. Where a country grants tax incentives to encourage foreign investment (e.g. tax holiday in respect of the profits of a company carrying on a pioneer industry) and that company is a resident of another country with which a tax treaty has been concluded, the other country may give the company “tax sparing” relief. This is achieved by the other country giving a credit against its own tax for the tax which the company would have paid if the tax had not been “spared” (i.e. given up) under the provisions of the tax holiday rules. The purpose of tax sparing relief is to prevent the loss of a double taxation credit from negating the incentive offered by the tax holiday, etc. provided for in the country which is seeking to encourage foreign investment” (IBFD, 1996:304). Tax sparing credit proviso is included in former Yugoslav DTCs with Finland (Art 22, Par 4), Norway (Art 23, Par 2), Sweden (Art 22, Par 3) and United Kingdom (Art 22, Par 1 and 3), still in use in the Republic of Croatia.

## 4 IMPACT ON AND OF INTERNATIONAL INSTITUTIONS AND ORGANISATIONS

### 4.1 MODEL TAX CONVENTIONS

The product of the systematic, international approach to the international double taxation problem (after World War I, within the League of Nations) was the first Model Double Taxation Convention, developed by the group of tax experts from various countries<sup>34</sup> Their work has been continued after World War II, under auspices of the OECD, and resulted in a new Model Convention (OECD Model Tax Convention on Income and on Capital). This is soft law, a document presented to the countries of the world as something to start with when negotiating their bilateral or multilateral treaties. Although every country has its own model, the OECD's, being a legal text of high quality, is so influential that hardly any country avoids it completely. Every article of the Model is accompanied with a commentary, explaining meanings and goals of the provisions.

A tax treaty is an international treaty that distributes taxing rights between contracting parties. A treaty based on the OECD Model will therefore confer its taxing rights distributions in its own text, and, as for the OECD Model, developing countries objected that it prefers interests of the developed countries over theirs when stipulating those distributions, giving developed countries considerably more taxing rights in the case of, e.g. dividend, interest and royalties taxation. Consequently, a new model was developed, this time under auspices of the United Nations; hence the name – United Nations Model Double Taxation Convention between Developed and Developing Countries. Although leaning heavily on the OECD Model, it changed some of its provisions so that they corresponded more with interests of the developing countries.

### 4.2 INFLUENCE OF BILATERAL TAX TREATIES ON MODEL TAX CONVENTIONS

International tax law, including the law of the DTCs, had already been highly developed by the time Croatia acquired her independence. Accordingly, Croatia's DTCs did not affect the model tax conventions. Furthermore, even considerably older, former Yugoslavian, DTCs did not influence these model conventions. Both countries entered into DTC negotiations at a time when a number of established solutions in existing model conventions had already existed.

### 4.3 INFLUENCE OF MODEL TAX CONVENTIONS ON BILATERAL TAX TREATIES

Croatia's DTC policy is, to a great extent, influenced by the OECD MC. It was the key legal document that served as starting point in tax treaty negotiations following the formation of the Republic of Croatia. The former Yugoslavian treaties, too, in general followed the OECD MC, quite likely under the influence of the co-contracting states. Those treaties, as a matter of course, deviated to a certain

<sup>34</sup> Those were: Bruins (The Netherlands), Einaudi (Italy), Seligman (USA) and Stamp (UK).

extent from the OECD MC due to the specific (self-governing, socialist) socio-economic system present in the former SFRY.

Generally, there are two widespread, internationally acknowledged, model conventions for negotiating DTCs – the above mentioned OECD MC, and the United Nations Model Double Taxation Convention between Developed and Developing Countries<sup>35</sup> (hereinafter: UN MC). The OECD MC is the earlier one, and it, along with the Commentaries accompanying every one of its articles, provided itself a pattern for the UN MC. While the OECD MC represents the interests of developed countries, the UN MC is more adjusted to the interests of developing countries. DTCs are, by definition, international agreements that distribute taxing rights between contracting parties. According to the UN MC, it means that, in DTCs with developed countries, developing countries have more taxing rights. It is, e.g. emphasized in the cases of the so-called passive income – dividends, interest and royalties (Articles 10, 11 and 12 of both MCs), where the UN MC stipulates the dominant taxing position for developing countries, contrary to the OECD MC, assigning the prevailing taxing position to developed states.<sup>36</sup>

The standard Croatian MC is today deeply rooted in the OECD MC. However, the Croatian MC does not follow the OECD MC to the letter. Some solutions in the Croatian MC are more in line with the UN MC, so the influence of the latter MC should also be taken into consideration. Those solutions enable the Croatian negotiators to pursue more flexibility as well as some key policy goals during the negotiations. The aforementioned influences should not be overrated. For example, despite being a developing and transitional country, Croatia in Article 5, Paragraph 3 (Permanent Establishment, a building site or construction or installation project) of its MC, opts for the twelve-month period as the one that constitutes a permanent establishment, rather than the six-month period suggested in the UN MC. This is, however, due to the specific position that the Croatian building enterprises are in, when compared to the Croatian enterprises generally. Although it has been previously mentioned that the Croatian economy is import-oriented, this is not the case in the building and construction sector. In a comparison between foreign construction companies working in Croatia and Croatian building enterprises engaged in activities abroad, the balance is heavily weighted in favour of the latter. Thus, the twelve-month period for constituting a permanent establishment is presently more in line with Croatian economic interests. It is also worth noting that Croatian legislation unilaterally provides for a six-month period in which a building site or installation project of a non-resident entrepreneur can constitute a permanent establishment.<sup>37</sup> There are some additional provisions in which the

<sup>35</sup> Available at: [<http://unpan1.un.org/intradoc/groups/public/documents/un/unpan002084.pdf>].

<sup>36</sup> When it comes to investments, developed countries are the countries from which the investors (and capital) come (i.e. they are the states of residence of the investors). Developing countries are the states from which the investment income originates (the states of source).

<sup>37</sup> See *Opći porezni zakon* (General Tax Law) (NN 127/00, 86/01, 150/02), Article 40 Paragraph 1 al. 7; *Zakon o porezu na dobit*, Article 4 Paragraph 2 Item 7.

Croatian MC differs from the OECD MC. Some of these provisions have been changed over time. It has to be said, as a general remark, that both versions of the Croatian MC, analysed below, envisage the fixed base, which has been removed from the OECD MC.

The mentioned differences and alterations are:

*Article 8 (Shipping, Inland and Waterways Transport and Air Transport).* That Article is in Croatian MC titled “Shipping, Inland and Waterways Transport Road and Air Transport” (emphasis added). According to the title, Paragraph 1 *in principio* reads “Profits from the operation of ships, aircraft or road transport vehicles...” (emphasis added), i.e. road transport vehicles have been added, which are not specifically mentioned either in Article 8 of the OECD MC or in the UN MC. This was already the object of criticism as a solution not following Croatian economic interests,<sup>38</sup> namely that the “inclusion of road transport into Article 8 represents the intention of countries in which the management of a great deal of international road transport enterprises is located, e.g. Turkey and Poland. The consequence is that the source country, even if the permanent establishment of the transport enterprise is located in that country, loses the right to tax. It can hardly be said that Croatia dominates the European road cargo transport market. Road transport should, therefore, be deleted from Article 8” (ibid).

*Article 10 (Dividends).* Paragraph 2, of the OECD MC provides for 5 and 15 per cent withholding tax rates in the source state for the beneficial owner, while the Croatian MC does not specify the percentage amounts.

*Article 11 (Interest).* Paragraph 2 has been omitted in the Croatian MC 2000. That MC provided for the exclusive right to tax the interest in the state of residency of the recipient of the interest, thereby denying the possibility for that interest to be taxed in the state of the payer and omitting at the same time the provision favourable for the beneficial owner of the said interest as the resident of the contracting state. It was a specific solution, not present in either of the MCs. The present Croatian MC, however, is in line with the UN MC.

*Article 12 (Royalties).* Paragraph 1 of the Croatian MC 2000 omitted beneficial ownership, i.e. it failed to provide beneficial ownership, together with residence, as a condition for taxation in the state of residence, and gave the exclusive right to tax to the state of residence. This provision is thus a mixture of the solutions that exist both in the OECD MC and the UN MC. Article 12, Paragraph 4 of the Croatian MC is identical to Article 12, Paragraph 5 of the UN MC, i.e. to the “permanent establishment (and fixed base) proviso”, authorising the state of the permanent establishment (and fixed base) to tax royalties if they are borne by the perma-

<sup>38</sup> Engelschalk, *Stručno mišljenje uz reformu obrasca za ugovor o izbjegavanju dvostrukog oporezivanja Republike Hrvatske* (Expert Opinion on the Reform of the Model Convention for the Avoidance of the Double Taxation of the Republic of Croatia), non-published, made available to the authors by the Ministry of Finance.

ment establishment or fixed base; in that case, they are deemed to arise in the state where the permanent establishment or fixed base are situated. Article 12, Paragraph 1 of the current Croatian MC endows the contracting state with the right to tax the resident who is beneficial owner of the royalties (in accordance with the OECD MC), but not exclusively; it also authorises the source state to tax dividends (in accordance with the UN MC). The rest of Article 12 follows the UN MC.

*Article 13 (Capital Gains).* Paragraph 4 (the gains derived from the alienation of shares in a company the value of which consists principally of immovable property in the source state), as it reads in the OECD MC, does not (and did not) exist in the Croatian MCs. This, however, is probably not the result of the pursuit of some specific tax treaty policy goal, but rather due to the fact that the Croatian MC in use now is dated July 2001 and therefore based on the version of Article 13 of the OECD MC at the time when that article did not itself contain Paragraph 4 as found in today's version. Notwithstanding the Croatian MC, however, some Croatian treaties concluded after the year 2002 contain Paragraph 4 as drafted in the OECD MC: the treaties with Bosnia and Herzegovina (entered into force on 1 January 2006), Chile (entered into force on 1 January 2005), Germany (entered into force on 1 January 2007), Ireland (entered into force on 1 January 2004), Jordan (entered into force on 1 January 2007), Moldova (entered into force on 1 January 2007), Spain (entered into force on 1 January 2007), and Yugoslavia<sup>39</sup> (entered into force on 1 January 2005). Paragraph 3 of the Croatian MC also refers to road vehicles in addition to ships and aircraft.<sup>40</sup>

*Article 14 (Independent Personal Services).* Although that Article was removed from the OECD MC in 2002, it is still present in the Croatian MC, as well as in the most recent Croatian tax treaties, which demonstrates the bearing of the UN MC. This is the case with the treaty with Austria (entered into force on 1 January 2002), Belarus (entered into force on 1 January 2005), Belgium (entered into force on 1 January 2005), Bosnia and Herzegovina (entered into force on 1 January 2006), Chile (entered into force on 1 January 2005), China (entered into force on 1 January 2002), Estonia (entered into force on 1 January 2005), France (entered into force on 1 January 2006), Germany (entered into force on 1 January 2007), Ireland (entered into force on 1 January 2004), Jordan (entered into force on 1 January 2007), Korea (entered into force on 1 January 2006), Latvia (entered into force on 1 January 2002), Lithuania (entered into force on 1 January 2002), Malaysia (entered into force on 1 January 2005), Mauritius (entered into force on 1 January 2004), the Netherlands (entered into force on 1 January 2002), San Marino (entered into force on 1 January 2006) and Yugoslavia (entered into force on 1 January 2005).

<sup>39</sup> Yugoslavia does not exist anymore, since it dissolved into two independent states – Serbia and Montenegro. However, the treaty concluded with Yugoslavia is still in use with both new countries.

<sup>40</sup> See *supra* the commentary on Article 8 of the Croatian MC.

Only a few new Croatian treaties follow the OECD MC and omit Article 14 altogether; these are the treaty with Moldova (entered into force on 1 January 2007), Slovenia (entered into force on 1 January 2006) and Spain (entered into force on 1 January 2007).<sup>41</sup>

*Article 15.* That Article of the Croatian MC is still entitled “Dependent Personal Services” in accordance with the UN MC and different from the OECD MC’s title “Income from Employment”. Paragraph 4 of that Article exists neither in the OECD MC nor in the UN MC. That paragraph regulates the treatment of the social security contributions, stating that:

“when [those contributions] are paid to a social security scheme in the other contracting state, they shall, in determining the individual’s taxable income, in the first mentioned state be treated in the same way and subjected to the same conditions and scope as contributions paid to social security scheme that are recognized as such for tax purposes in the first mentioned state, provided that:

- the individual was not a resident of that state immediately before he began to exercise employment in that state, and the contributions to the social security scheme for such individual were already paid in the other state, and
- the competent authorities of the first mentioned state have established that the institutions to which contributions for social security scheme are paid in general correspond to the institutions that are in that state acknowledged as such for tax purposes.”

This paragraph also regulates what is covered by the term “social security scheme” in Croatia and in the other contracting state for the purposes of Article 15. From the wording of the provision, it could be construed that it is aimed at preventing avoidance of social contributions payments, and that it is based on reciprocity. The present Croatian MC does not contain such a provision, and its Article 15 is in line with the OECD MC.

*Article 18 (Pensions).* In the present Croatian MC, it is fully in line with the OECD MC. The Croatian MC 2000, however, contained three paragraphs. The first paragraph closely followed the provision of the OECD MC. The second paragraph (allocating the right to tax payments received by the resident of the contracting state to the state under whose public social security scheme the payments were received) was in accordance with Article 18, Paragraphs 2 and 3 respectively (alternatives A and B of Article 18) of the UN MC. The third paragraph contained a definition of the term “rent”.

<sup>41</sup> Interestingly, the version of the Croatian MC, dated October 2000, did not contain the Independent Personal Services article; it was removed from the MC, although at that time it was still present in the OECD MC. However, that article was (again) included in the present Croatian MC.

*Article 22 (Capital).* Article 22 of the Croatian MC differs from the OECD MC in that it, in Paragraph 3 (the road transport vehicles alongside ships, aircraft and boats), contains the items of capital taxable in the contracting state in which the place of effective management of the enterprise is situated.<sup>42</sup>

*Article 23.* The present version of Article 23 (Avoidance of Double Taxation) is completely in line with Article 23B of the OECD MC. Furthermore, all Croatian treaties (except for those concluded by the former SFRY) contain the credit method for the avoidance of double taxation.<sup>43</sup> It is all the more surprising that the Croatian MC 2000 contained the exemption method as a general rule in Paragraph 1a, and the credit method, as a *lex specialis*, in Paragraph 1b, for dividends not included under (a), remuneration derived in respect of employment exercised aboard a ship, aircraft or road transport vehicle<sup>44</sup> operated in international traffic, or aboard a boat engaged in inland waterways transportation, director's fees, and the income of artists and sportsmen. Paragraph 2 provides for the non-application of Paragraph 1a "if the other contracting state exempts income or capital of the Croatia's resident, or applies the provisions of Paragraph 2 of Article 10 and 11 to such income".

*Article 27 of the OECD MC (Assistance in the Collection of Taxes).* Neither it is included in the Croatian MC, nor is it found in the treaties that Croatia has concluded thus far. When asked, the officials of the Ministry of Finance could not explain the non-inclusion of Article 27 by any systemic policy goal. Rather, it appears that: (1) no immediate pressure or interest exists, which would lead to inclusion of that article of the OECD MC in the Croatian MC, and (2) no general long-term policy (e.g., international administrative cooperation) dictates such an inclusion either.

However, since Croatia, due to its accession to the EU, had to include *acquis communautaire* in its legal system, the Croatian General Tax Act has been significantly amended. EU Directives 77/799 EEC and 2008/55 EC, regulating administrative cooperation in the field of direct taxation, are now part of the General Tax Act, providing the legal basis for assistance in the collection of direct taxes at least with the EU Member States.

## 5 CONCLUSION

Croatian DTC policy could (and should) be analysed with the reference to two periods of time: (1) the period since Croatia declared independence, and, (2) the period when Croatia was a part of the former Yugoslavia when a certain number of treaties was concluded, some of which are still in force in Croatia today.

<sup>42</sup> See *supra* the commentary on Article 8 of the Croatian MC.

<sup>43</sup> However, see *supra* for the exemption in the treaty with Switzerland.

<sup>44</sup> For the road transport vehicles, see *supra* the commentary on Article 8 of the Croatian MC.

1) As for the first mentioned time period (although it chronologically comes later), one may say that there were no significant changes in the Croatian double tax treaty policy during the whole period from independence until the present. There are at least two reasons for such consistency: first, the time period is too short for any substantial changes to have occurred; and second, and by far more important, there was no driving force to initiate even the formation of a well-grounded and elaborated double tax treaty policy, let alone to change it over the years. On the other hand, it was never doubted that Croatia needed a double tax treaty network; as explained above, concluding these treaties was another opportunity to confirm the international relevance and independent status of the new country, and every such opportunity has been readily seized.

In the absence of deliberate efforts to articulate a tax treaty policy founded on distinct interests and aimed at achieving certain clearly defined goals, the main role in the tax treaty negotiations was played (and is still being played) by administrative experts, i.e. the officials of the Ministry of Finance. Pressured, from the one side, by the imperative to build the Croatian double tax treaty network, and faced, from the other, with a lack of policy direction, they resort to a reliable source – the OECD MC (although the UN MC and its influence, must, by no means, be neglected).<sup>45</sup>

2) The former SFRY's tax treaties, although some of them are still applicable in Croatia, were the product of a different socio-economic system, and, consequently, of a different legal culture. As far as the former Yugoslavia is concerned, it was firmly grounded (1) in the system of so-called self-governing socialism, and (2) in the position of the former Yugoslavia as a developing country. Both these characteristics were expressed in the provisions of the treaties. Therefore, they were, more or less, the product of a defined interest and policy, stemming ultimately from an ideological point of view, which is evident in their terminology; e.g. they use terms typical for the then socio-economic order ("organization of associated labour", "income of organization of associated labour"). On the other hand, that system did not know of dividends as a form of corporate or individual income. Regarding the system from which they originated, it could be concluded that those treaties, while applicable through some legal interpretational effort, were terminologically not completely suited for the market-oriented system.

Thus, the main incentive for the changes in the double tax treaty policy in the case of Croatia turned out to be the major historical switch from a planned to a market-oriented economy, accompanied with the appearance of the Republic of Croatia as a new subject in the international arena, and not the subtle changes in the other-

<sup>45</sup> Information acquired during a short interview the author (Hrvoje Arbutina) had with the official of the Ministry of Finance, on 27 May 2008.

wise well-established double tax treaty policy that developed over a longer period of time.

When, in the context of the DTC policy, comparing the situation of the former Yugoslavia with that of the Republic of Croatia, one thing is evident – the difference in the number of the DTCs. While former Yugoslavia, during its forty-five years history, concluded 22 such conventions, Croatia, in twenty years of its existence, concluded fifty DTCs. The former SFRY was evidently very cautious when concluding them. This should be ascribed to general suspicion regarding foreign investments taking place in the country. Those conventions are widely perceived as a vehicle to induce such investments, through eliminating tax obstacles. While Croatia is by no means a primary target for foreign investments in today's world, those suspicions are certainly not part of the prevalent ideology anymore, so the new country feels free to build an extensive network of DTCs. They have not so far proved efficient in attracting foreign capital, however, so one can conclude that, while not harmful, they are, generally, rather neutral legal instruments, only waiting for the chance to be substantially helpful.

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# The Economics of European Integration

RICHARD BALDWIN and CHARLES WYPLOSZ  
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*In the infancy of societies, the chiefs of state shape its institutions; later the institutions shape the chiefs of state.*

*Baron de Montesquieu*

To write a book that deals with the economics of European integration is in itself a very ungrateful job, due to the constantly changing and fast-growing nature of the topic. But when the book is being written in the midst of the greatest economic and political crisis in the European Union's and the eurozone's history, the job becomes increasingly difficult in many ways. The changes that the EU has undergone in recent years have altered the very foundation of European integration and the principles upon which it has been built. Authors who deal with this topic therefore face a difficult dilemma. On the one hand, in order comprehensively to examine the causes and analyse the consequences of current events, from both a scientific and an educational aspect, the authors must approach them with a certain time lag. Otherwise, they run the risk that events will in the very near future refute the conclusions they have made. On the other hand, since the current events profoundly interfere with basic assumptions and "pillars" upon which the process of European economic integration stands, any book that ignores them will be outside the context of the time we live in, while its value and applicability will be significantly diminished.

The fourth edition of the book *The Economics of European Integration*, published in 2012, authored by Richard Baldwin and Charles Wyplosz, reconciles the two aforementioned problems in an exceptional way, despite the difficulties encountered by the authors during the book writing process. Just as the 2008 global financial crisis disrupted the authors in writing the third edition of this book (published in 2009), so the eurozone sovereign debt crisis and the uncertainty over the future of European Monetary and Economic Union (EMU), which has followed, significantly hampered the writing of the book's fourth edition. The book went to print in late 2011, at a time when many economists predicted not only a dramatic change in the structure of the eurozone, but also its disintegration. However, Baldwin and Wyplosz skilfully deal with the issue of uncertainty about future events. They have considerably changed chapters that dealt with macroeconomic theory in the third edition in order to put more emphasis on issues that have arisen as a result of the crisis – e.g. the functioning of global financial markets, the problem of banking sector regulation in the EMU and the role of the U.S. subprime market in the evolution of the crisis. In addition, the authors have provided a completely new chapter entirely devoted to the sovereign debt crisis in the eurozone. In it, the short- and long-term implications of eurozone leaders' decisions in resolving the debt crisis are analysed in detail, the fundamental institutional and political weaknesses upon which the eurozone is based are emphasized and several possible outcomes of the current situation are discussed, with the appropriate argumentation for each scenario offered.

As an additional step forward in improving the quality of the book, I would rate the fact that the authors removed the section covering the fundamentals of macroeconomic models (for example, the IS-LM and AS-AD model), given that they are taught at the beginning of every undergraduate study of economics. Since the book is primarily intended for senior undergraduates, the assumption that the target audience will manage these models well seems reasonable so their repetition would have been unnecessary and uneconomical. On the other hand, by doing so, the authors made room for the very important new chapter dealing with the eurozone crisis without making the book longer than it already is.

The book consists of 19 chapters grouped into five thematic sections. Since an understanding of the functioning and importance of European economic integration requires much more than a mere knowledge of economics, the first section deals with issues of the historical context of the European Union, its institutions, legislation and decision-making systems through three introductory chapters. The retrospective concerning the creation of the EU can be useful even to students who are familiar with the historical facts, as it gives a clear insight into the political and economic logic behind the founding of the Union. The authors point out that the original idea guiding the creation of the European Union was not an economic union, but rather cooperation between countries in order to prevent future conflicts of catastrophic proportions on European soil, as exemplified by the First and Second World War. Also, the authors show how disagreements on the required degree of sovereignty of member states, which are still very topical, especially in the light of the British announcement of a possible EU exit, were present in the very beginning of the European Union.

Making the interactive content available online is standard for most recent textbooks, and the book does not disappoint in this respect. For instance, by following website links one can listen to the original speech by Winston Churchill from Zurich in 1946 in which the British prime minister calls for creation of a “United States of Europe”, or a speech by Charles de Gaulle in 1963 in which he expresses the famous non to the membership of the United Kingdom in the European Community. The novelty of the fourth edition is that it analyses the changes brought about by the Lisbon Treaty, which entered into force in late 2009. In this respect, I find particular interest in the way in which the authors link game theory with the decision-making system in the EU institutions defined by the Lisbon Treaty. This is essential for understanding the changes that are currently taking place in this area, i.e. the tendency of jurisdiction and sovereignty to be transferred from the national to the supranational level. On the other hand, one could complain that the book almost completely ignores the prospect of further enlargement of the EU, although Croatia became a new member state in 2013.

The remaining four thematic sections can be grouped into microeconomic (second and third sections) and macroeconomic (fourth and fifth sections) views of Euro-

pean integration. In both cases, the authors first introduce the basic micro/macroeconomic tools for understanding the theoretical foundations of economic integration in general, and then extensively examine the micro/macroeconomic policies implemented by the European Union.

Through five chapters, the second section provides methods for the microeconomic analysis of economic integration. Using basic microeconomic tools, the authors explain the economic logic behind the key concepts of the European Union and their effects on economic entities inside and outside the integration, e.g. customs policy, preferential trade liberalization or economies of scale. Emphasis is put on the effects of European economic integration on economic growth in member states in the medium and long run, linking some empirical case studies of EU countries with the theory of neoclassical and endogenous growth. The second section ends with the microeconomics of the labour market, in order to explain the impact of migration and social transfers on (un)employment, wages and growth rates within the economic integration.

The third section deals with specific microeconomic policies implemented by the European Union. The economic logic and the facts necessary for the understanding of the Common Agricultural Policy (CAP) are extensively analysed, especially in light of its impact on international trade and the reforms that will follow in the 2014-2020 budget framework. EU regional policy and the location effects of economic activity are explained by the neoclassical Heckscher-Ohlin theory and the theory of the so-called new economic geography, thereby effectively explaining the empirical finding that despite greater economic cohesion among EU countries, economic integration and EU regional policy lead to greater centralization and regional disparities within countries – a fact rarely mentioned by the media. Unfortunately, the authors dedicated very little space to the role of the structural funds and other EU programs in achieving the objectives of cohesion and regional development, while the pre-accession funds and their importance in preparing candidate countries for EU membership are not even mentioned, which I would consider one of the book's rare deficiencies.

Furthermore, the third section deals with the competition and state aid policy in the EU. From an educational perspective, it is commendable that the authors do not choose an approach in which they only describe the characteristics of the Union's policy, but rather they explain the economic logic behind the fight against anti-competitive behaviour of economic agents, which is corroborated by a number of case studies. The section concludes with an analysis of EU trade policy, which enjoys considerably less public attention than the CAP and regional policy, but is, as Baldwin and Wyplosz point out, probably the only foreign policy of the EU which is consistently efficient and has made the EU the largest and most important participant in the world trade.

Using a similar principle to the one used to examine microeconomic aspects of economic integration in the second section, the fourth section describes the basic macroeconomic principles and tools needed to understand the economic and monetary integration, through three chapters. The authors examine a variety of topics, ranging from theoretical assumptions and the implications of interest rate parity, purchasing power parity and the “impossible trinity” in order to explain the choice of the exchange rate regime, to a comprehensive historical review of European monetary integration, starting from the gold standard and Bretton Woods to the creation of the European Monetary System and the introduction of the euro. The fourth section concludes with a chapter on optimum currency areas (OCA). I regard this as the key chapter for an understanding of what follows in the fifth section, and from a teaching point of view, the best analysis of the fulfilment of OCA criteria by the eurozone, or lack of it, that I have come across. The authors very intuitively explain why each of the six economic and political criteria has been included in the OCA theory and what the potential consequences are if one or more of them are not met. They make it clear to readers that the theory does not offer a clear cut answer to the question of whether a particular area is also the optimum currency area, but rather gives us a tool to assess the costs and benefits of forming or joining a monetary union. Baldwin’s and Wyplosz’s analysis of fulfilment of the OCA criteria by the eurozone is a great introduction to the last, fifth, section of the book.

The fifth section begins with a chapter that analyses the main features of the eurozone’s monetary policy. Again, in a very intuitive way the authors explain how each of the five convergence criteria set out in the Maastricht Treaty contribute to the achievement of the main objective of the European Central Bank (ECB) – maintaining price stability. Along with an explanation of how the Eurosystem and its instruments for implementing monetary policy function, the chapter provides the analysis of the EMU’s success in achieving the goals set during its first decade of existence, until the onset of the global financial crisis. This is followed by a chapter concerning fiscal policy and the Stability and Growth Pact, which was designed as an insurance policy to sanction fiscally undisciplined countries and thus maintain the stability of the eurozone. Baldwin and Wyplosz skilfully manage to explain the inherent flaws of the Pact, present since its inception and coming to the fore in full glory a decade later, and which are a direct result of failures to meet some of the OCA criteria. The authors could be criticized for not devoting more attention to the reform of the Pact in 2005, which considerably relaxed the required level of fiscal discipline, increased moral hazard and directly contributed to the emergence of the sovereign debt crisis in the eurozone. Moreover, the authors do not address the issue of the growing democratic deficit in the eurozone, which is reflected in the growing supranational jurisdiction of the European Commission and the Council of the EU in dictating national fiscal policies. Because these bodies do not have to bear the consequences of their policies, resistance to stronger fiscal coordination at the EU level tends to be generated. Since the book

was published in 2012, it does not include the recent agreement of the member states regarding the implementation of a new, perhaps crucial fiscal pact (Fiscal Compact), which significantly redefines the level of fiscal sovereignty of member countries. This is the topic to which I assume the authors will certainly pay a lot of attention in any subsequent edition.

In the chapter on financial markets the authors emphasize the deficiencies of the eurozone in terms of regulation and prudential supervision of financial institutions that directly contributed to the spread of the financial crisis in the United States in 2007 and 2008 and the efforts that are being undertaken in order to implement regulation at the supranational level. The section concludes with the chapter already mentioned on the crisis in the eurozone, its causes, consequences and potential outcomes and discusses possible long-term solutions that should prevent its recurrence.

To conclude, the book *The Economics of European Integration* in its fourth edition represents an improvement over the already successful and very popular third edition. In an intuitive and accessible way it gives the reader an insight into the facts, theories and controversies that are the driving force of rapid and constant changes within the European Union. Focusing on the latest developments in the eurozone, the book provides extra value which makes it worth obtaining a new edition. By combining the economic with historical, political and legal approaches Baldwin and Wyplosz have produced a comprehensive work that is accessible to a wider circle of readers and that makes it easier to understand the complicated process of European economic integration. The writing is not particularly challenging to read, it does not require advanced mathematic or econometric skills, but requires a knowledge of the basics of economics, microeconomics and macroeconomics. In any case, for anyone interested in the economic issues of the European Union and European economic integration, this book is an excellent starting point.

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