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# Unemployed and long-term unemployed in Croatia: evidence from Labour Force Survey

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*The paper provides the analysis of the differences between the unemployed and employed on the Croatian labour market based on their individual characteristics. The basis for the analysis is the Croatian Central Bureau of Statistics' Labour Force Survey for the year 2006. The analysis was conducted separately for the male and the female subsample. The results imply that occupation, immigrant and marital status are significant predictors for both male and female population, while education, age and living in urban settlements have certain gender specificities.*

*The additional question addressed in this paper is - are the long-term unemployed in their characteristics different in comparison to short-term unemployed. The empirical analysis revealed that, in addition to specific categories of occupation and marital status, age is significant for both male and female population. Reservation wage is significant for male, while education for female population.*

**Key words:** unemployment, long-term unemployment, Croatia.

## INTRODUCTION<sup>1</sup>

Unemployment in Croatia is still, although for a period since 2002 declining, relatively high when compared to other countries, transition countries that have become EU member states as well as old EU member states (Figure 1). The unemployment rate in Croatia for the year 2007 was, according to the ILO measure, 9.7 percent in the last quarter and according to the registered unemployment (unemployed registered by Croatian Employment Serv-

ice) 14.4 percent in December. This high unemployment is accompanied by a high share of the long-term unemployed. The long-term unemployed are sometimes regarded as unemployable by employers, as they are perceived to have lost contact with labour markets, do not have skills required by the fast-changing labour demand and are in general less able to adapt to the changed socio-economic situation, which might lead to the duration dependence effect (Machin and Manning, 1999).

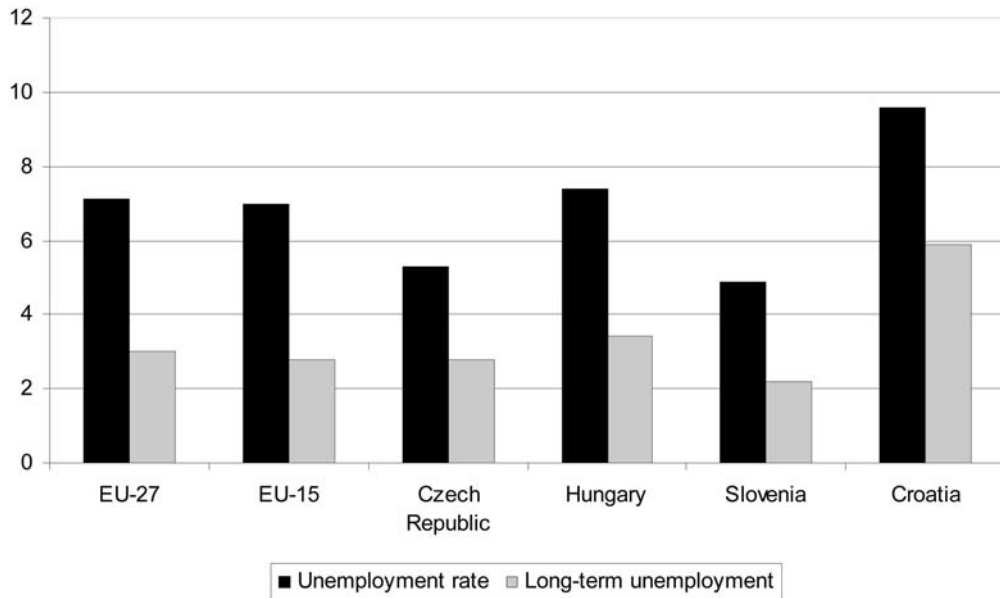
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Figure 1.

Unemployment rate and long-term unemployment rate: comparison with selected countries, 2007



Source: Eurostat.

Note: long-term unemployed as a percentage of active population.

This paper addresses the issue whether individual characteristics of the unemployed population in Croatia differ in comparison to characteristics of the employed. Additional aim is to investigate whether individual characteristics of the long-term unemployed differ, in comparison to individual characteristics of short-term unemployed.

Unemployment issue in the Croatian literature has been previously for the most part addressed at the overall level or at the level of specific population groups. Katić (2006) analyses the dynamics of the unemployment, long-term unemployment and the age structure of the unemployed<sup>2</sup>, as well as educational structure of the unemployed and employed in Croatia and

provides comparison of the overall trends with the data for other countries. Similar analysis can be found in Bejaković and Gotovac (2003), who focus their paper on providing policy recommendations to alleviate unemployment problems. Kerovec (2001) puts an emphasis on the employability of older population, while Kerovec (2003) reconsiders women position on the Croatian labour market. On the other side, Škare (2001) analysed the unemployment problem from the macroeconomic perspective of labour demand.

Previous studies on differences in individual characteristics of the unemployed and employed, and in particular long-term unemployed in Croatia are relatively scarce. A notable exception can be found in Šverko,

<sup>2</sup> More recent data on these indicators can be found in Bejaković (2007).

Galešić and Maslić-Seršić (2004) who have performed a survey on a sample of 1138 registered unemployed persons in June and August 2003. Based on their analysis, the duration of unemployment spells is significantly related to demographic characteristics of the surveyed individuals, such as age, education and marital status. Similar findings also based on the sample of registered unemployed are reported in UNDP (2006), where in addition to the mentioned characteristics it can also be found that people who were unemployed for a shorter period of time have significantly higher chances for employment than those unemployed for more than 3 years.

The central empirical contribution of the study presented in this paper is to shed light upon the individual characteristics of the unemployed population in Croatia, and to assess whether these characteristics are significant predictors of the risk of unemployment. Furthermore, individual characteristics of the long-term and short-term unemployed are analysed. The analysis is conducted based on the dataset from the Croatian Central Bureau of Statistics' (CBS) Labour Force Survey (LFS) for the year 2006.<sup>3</sup>

The structure of the paper is as follows: Section 2 presents the sample used,

as well as basic intuition behind the variables used in empirical estimation. Section 3 presents the empirical analysis of the unemployed-employed differences. Section 4 investigates the long-term unemployed characteristics in comparison to the short-term unemployed. Section 5 brings the conclusions.

### PRELIMINARY DATA ANALYSIS AND BRIEF METHODOLOGY EXPLANATIONS

Unemployment is, on one side, a global labour market phenomenon, and on the other the risk of falling into unemployment can influence every individual's life, as the unemployment is considered as highly undesirable state. The probability of falling into unemployment is therefore a frequently analysed research question. Having in mind relative scarceness of empirical literature on this question in Croatia, this paper presents the results of the analysis rather extensively. Prior to presenting empirical results, a discussion of the used data, as well as the intuition behind the selected variables is briefly presented.

In exploring why some individuals are employed while others are unemployed, several variables were proposed in the literature as possible explanations. The choice

<sup>3</sup> Basic information on the methodology of the Labour Force Survey is published within every first release of the data on Croatian Bureau of Statistics Internet page [www.dzs.hr](http://www.dzs.hr). Therefore, here we only briefly present the key information relevant for the data presented in the analysis that follows. In Croatia, the LFS was for the first time carried out in November 1996 as an annual survey. It was carried out in the same manner in June 1997. The Survey has been carried out continuously since 1998, meaning that every month a part of the total sampled households is interviewed. Interviewers visit each household and conduct an interview lasting approximately 20 minutes. **Persons in employment** are those who were engaged in any work for payment in cash or kind during the reference week. The Survey covers all persons who worked for at least one hour in the reference period, irrespective of their formal status or means of payment. **Unemployed persons** are those who meet the following criteria:

- a) in the reference period did not work for payment in cash or kind;
- b) were actively seeking work during four weeks prior to the Survey, and
- c) were currently available for work within the next two weeks.

Those who have found a job to start in the future are also included. **Inactive population** in the Survey consists of persons under the age of 15 as well as those of working age who are neither employed nor unemployed. For the purpose of the analysis in this paper, individuals under the age of 15 have been excluded from the sample.

of independent variables in the analysis in this paper is based on similar empirical analysis for other countries, where they were found to be significant variables for estimating the risk of unemployment (for example Arai and Vilhelmsson (2004), OECD (2003), Thapa (2004)).<sup>4</sup> Demographic variables, such as gender, marital status, age and immigrant status are already well-established explanations behind the higher probability of unemployment, which are across countries more or less visible for the specified population groups (OECD, 2006.). Therefore, they are included in the empirical analysis of the risk of falling into unemployment in this analysis as well. Based on empirical findings in studies in other countries, we would expect that males have more chances of being employed and that immigrants<sup>5</sup> have higher risk of unemployment. All the usual demographic variables are included in estimations and it is expected that the vulnerable groups in other countries (immigrants, older population) will also be vulnerable to higher risk of unemployment in Croatian case.

When estimating the risk of unemployment, but also when analysing labour market outcomes in wider perspective, it is frequently assumed in the empirical literature that gender plays a significant role (Azmat et al, 2006). Certain gender differences regarding the labour market outcomes have been previously detected on the Croatian labour market as well (Kerovec (2003), Matković (2008)). In order to incorporate these assumptions, the analysis is

conducted separately for male and female population.<sup>6</sup>

Nickell (1979) analysed the probability of leaving unemployment and found out that married people find jobs faster than single. The link between the labour market outcome and marital status has also been analysed in the literature from another aspect. Couple formation can be considered as a kind of insurance against poverty. In that context, Ekert-Jaffe and Solaz (2001) found that unemployment generally delays couple formation. The intention in this paper was not to put emphasis on the marital status, but rather to include it as a control variable. Therefore, only three different categories of marital status were considered. Individuals either married or cohabitating are classified as married. Individuals divorced, widowed or separated are classified as divorced. The third category is singles.

Evidence from estimates for other countries suggests that urban areas, at least capital cities, are having more vibrant labour markets (OECD (2003), Thapa (2004)). The probability of finding a job might be, therefore, higher for a person living in urban areas in Croatia as well. One of the reasons for this assumption might be that the labour market intermediators in urban areas are more widespread, and the matching efficiency on the labour market is consequently higher. The other is that the regional structure of the labour market (in terms of economic activity, but also in terms of labour supply) is different, and job creation activities are more frequently

<sup>4</sup> In addition to empirical studies, the fact that the risk of unemployment varies across population has been already transformed into policy measures. The overview of various policy measures to increase the participation of vulnerable population groups in different countries (including women, immigrants, older population) is presented in OECD (2006).

<sup>5</sup> In this paper immigrant status definition is wide. All persons not born in Croatia are considered immigrants.

<sup>6</sup> I would like to thank an anonymous referee for this suggestion. The approach to the modelling could have been somewhat different. Namely, gender could have been included as additional dummy variable in the whole sample estimates, like, for instance, Gangji and Plasman (2008), Arai and Vilhelmsson (2004).

located in urban areas. To include these assumptions, separate variable for urban areas is included, with all persons living in urban or semi-urban settlements were classified as urban population.

Education<sup>7</sup> is a human capital variable, and it is frequently assumed that higher education leads to increased chances of finding a job. We assume that this hypothesis will also hold in Croatia, as published LFS data already provides some evidence to support this assumption. Specifically, according to the data for 2006, the share of the persons with university and post-graduate degree in the total population of employed is twice as large as in the population of the unemployed. This argument is substantiated by the data on registered unemployed employment rates by education, which indicate that higher levels of education (university and higher) are correlated with higher employability rates of unemployed population (Hrvatski zavod za zapošljavanje, 2008) In addition, the existing evidence for registered unemployed in Croatia implies that employability of first-time job-seekers is significantly higher if they have university education (Hrvatski zavod za zapošljavanje, 2005).

The last set of explanatory variables considered in the analysis is related to the person's occupation, or in the case of unemployed person's previous occupation.<sup>8</sup> Based on the available data from the LFS, occupation in the analysis is defined as the occupation of the main job listed by the

employed person and as the occupation in previous job listed by the unemployed person. The unemployed persons without previous job are classified as first-time job seekers<sup>9</sup>. These variables might potentially be the most significant factors behind the individual's risk of unemployment. The reason behind it is the restructuring, which is associated with increased mismatch on the labour market, with consequence that certain occupations might be facing excessive demand while simultaneously others might experience excessive supply (Obadić, 2006). Consequently, occupation of an individual might significantly influence the probability of finding a job. This factor could be especially significant in a transition economy, where the structure of the economy is changing relatively fast, and the structure of demand on the labour market is altering accordingly, while the labour supply side is not being able to adjust in the short period of time.

As already stated, the analysis is conducted on the LFS data. The sample for the year 2006 covers more than 35,000 individuals – in the first half of 2006, 18,077 individuals living in 6,641 households were interviewed, and in the second half of the year 17,538 individuals living in 6,487 households. For the estimation purposes, individuals not residing in Croatia were excluded from the sample. Furthermore, inactive population was excluded from the empirical estimation and in the first regression only those employed or unemployed

<sup>7</sup> Categories of level of education in LFS refer to the categories defined by the CBS, as published in Statistical Yearbook (Državni zavod za statistiku, 2008.). Following a suggestion by an anonymous referee, the categories were not treated separately in the analysis, but rather they were grouped. As lower secondary education, categories »No school«, »1-3 basic school grades«, »4-7 basic school grades« and »Basic school« are considered. As upper secondary education, categories »School for skilled and highly skilled workers«, »Vocational secondary schools« and »Grammar school« are included. As tertiary education, categories from »Non-university college« to »Doctorate« are considered. The detail structure of employed, unemployed, and inactive by education is generally available in LFS First Release.

<sup>8</sup> Occupation categories are defined according to standard (ISCO) classification.

<sup>9</sup> In some cases the answers to these questions were classified as »Unknown occupation«. These were excluded from the sample and from further analysis.

were considered, while the second regression includes only the sample of the unemployed.<sup>10</sup> The definitions of the unemployed and employed persons are consistent with the usual CBS methodological definitions, which are fully harmonized with ILO and Eurostat methodologies.

Table 1 presents key characteristics of the sample data.

The sample characteristics reveal that the largest differences between male and

female population are related to the structure of education and occupation. These differences are notable both for unemployed and employed. Female population has relatively higher share of employment and unemployment in »Services and sales«, which are traditionally considered to be female occupations. There is also a high share of both employed and unemployed men in this category, although dominant share in employment and unemployment for male

Table 1.  
*Unemployed, employed and inactive – sample characteristics*

	Male			Female		
	Employed	Unemployed	Inactive	Employed	Unemployed	Inactive
Age (years)	42.1	34.9	53.0	42.3	35.2	56.4
In percent of relevant population group						
Married	68.5	37.9	57.5	70.9	59.0	45.4
Divorced	3.5	2.5	11.6	10.9	4.5	35.4
Living in urban settlements	50.8	54.3	55.6	55.8	57.4	53.2
Immigrants	11.0	15.7	12.7	9.9	13.9	13.5
Level of education (percent):						
Lower secondary	18.0	23.7	45.5	22.9	20.1	65.7
Upper secondary	67.0	69.1	45.7	55.8	69.2	29.8
Tertiary	15.0	7.3	8.8	21.3	10.7	4.5
Occupation (percent):						
Armed forces occupations	1.2	0.7		0.1	0.0	
Managers	6.9	2.3		2.9	1.4	
Professionals	6.9	1.5		11.0	2.6	
Technicians and associate professionals	13.7	5.2		15.0	5.1	
Clerical support workers	5.1	3.2		17.7	9.0	
Service and sales workers	10.8	11.8		19.8	24.0	
Skilled agricultural, forestry and fishery workers	12.2	1.0		15.6	1.4	
Craft and related trades workers	21.8	18.1		2.2	2.6	
Plant and machine operators, and assemblers	14.8	12.9		6.5	9.3	
Elementary occupation	6.6	14.9		9.1	12.4	
First-time job seekers		26.8			31.1	
Sample size (N)	7259	811	6249	5937	880	9189

Source: author's calculations based on LFS data.

<sup>10</sup> The exact sample size is presented in every table.

subsample is in »Craft and related trades« occupation. In addition to justifying the separate female and male regressions, inspection of sample data also provides a simple indicator of possible mismatch on the labour market. Namely, there is a relatively higher share of unemployed with only elementary occupation, as opposed to their share in employment, for both subsamples. On the other side of the spectrum, there is a relatively small share of the unemployed within »Managers«, »Professionals«, and »Technicians and associate professionals«, relative to their share in employment.

### EXPLORING THE UNEMPLOYED-EMPLOYED DIFFERENCES

After discussing the choice of variables and presenting the characteristics of the

sample used for estimation, we turn our attention to the presentation of results. In the first pair of regressions, estimation sample contains unemployed and employed. Since the data presented in Table 1 revealed that the share of both employed and unemployed in »Armed forces occupations« are negligible, they were excluded from the estimation sample. Furthermore, unemployed individuals without previous employment (first-time job seekers) are also excluded from the sample, as their lack of occupation in previous job would be perfect predictor for unemployment status. The estimation was carried out within the probit model framework, with the dependent variable having positive value for the unemployment status.

Table 2 presents the results of the unemployed-employed estimation.

Table 2.  
Probit estimation, predicting the unemployment vs. employment status

	Male		Female	
	Estimated coefficients (robust standard errors)	Marginal effects (at x-bar)*100	Estimated coefficients (robust standard errors)	Marginal effects (at x-bar)*100
Constant	-1.94*** (0.24)		-2.16*** (0.27)	
Age	0.01 (0.01)	0.00	0.03** (0.01)	<b>0.01</b>
Age-squared/100 (robust standard error/100)	-0.01 (0.01)	-0.00	-0.04*** (0.02)	<b>-0.01</b>
Marital status (vs. single)				
Married	-0.47*** (0.06)	<b>-0.06</b>	-0.14** (0.07)	<b>-0.02</b>
Divorced	-0.35*** (0.13)	<b>-0.03</b>	-0.30*** (0.11)	<b>-0.03</b>
Living in urban settlements	0.11** (0.05)	<b>0.01</b>	0.08 (0.05)	0.01
Immigrants	0.22*** (0.06)	<b>0.03</b>	0.13* (0.07)	<b>0.02</b>
Level of education (vs. Upper secondary education):				
Lower secondary	0.66*** (0.06)	<b>0.03</b>	-0.02 (0.08)	-0.00



Continuation of Table 2.

	Male		Female	
	Estimated coefficients (robust standard errors)	Marginal effects (at x-bar)*100	Estimated coefficients (robust standard errors)	Marginal effects (at x-bar)*100
Tertiary	-0.08 (0.10)	-0.01	-0.22** (0.10)	<b>-0.03</b>
Occupation dummy variables (vs. Technicians and associate professionals):				
Managers	-0.00 (0.13)	-0.00	0.18 (0.16)	0.03
Professionals	-0.25 (0.16)	-0.02	-0.03 (0.13)	-0.00
Clerical support workers	0.15 (0.13)	0.02	0.14 (0.09)	0.02
Service and sales workers	0.45*** (0.09)	<b>0.07</b>	0.58*** (0.09)	<b>0.10</b>
Skilled agricultural, forestry and fishery workers	-0.78*** (0.18)	<b>-0.06</b>	-0.46*** (0.16)	<b>-0.05</b>
Craft and related trades workers	0.31*** (0.09)	<b>0.04</b>	0.56*** (0.15)	<b>0.11</b>
Plant and machine operators, and assemblers	0.34*** (0.09)	<b>0.05</b>	0.69*** (0.11)	<b>0.14</b>
Elementary occupation	0.72*** (0.10)	<b>0.13</b>	0.67*** (0.11)	<b>0.13</b>
Diagnostics				
N	7748		6533	
LogL	-1872.57		-1831.03	
Wald chi <sup>2</sup> (16)	297.04		310.20	
Pseudo R <sup>2</sup>	0.09		0.08	
Prediction (%)	92.57		90.88	
Hosmer-Lemeshow	7.37		6.61	
Classification table	True		True	
Classified	Unemployed	Employed	Unemployed	Employed
Unemployed	-	-	-	-
Employed	576	7172	596	5937

Source: author's estimates.

Note: Coefficients marked \*\*\* are significant at level of 1%, \*\* at level of 5%, and \* at level of 10%.

Marginal effects are evaluated at the mean of the sample data. The marginal effect of specific variable is expressed as the percentage point changes from this level of the predicted probability of unemployment at the mean of the data. For dummy variables, the marginal effect represents the change in the probability of unemployment for persons with and without that characteristic, holding other characteristics constant at the same time.

Pseudo R<sup>2</sup> is relatively small<sup>11</sup> for both subsample. Furthermore, the classification estimates, and slightly higher for male table of the predicted values of the depend-

<sup>11</sup> This is a common consequence of an unbalanced sample, such as here, where the number of employed persons in the sample is larger than the number of unemployed. For details, see Greene (2000: 833).

ent variable indicates that the model fails to correctly assign unemployed individuals.<sup>12</sup> From the evidence presented in Table 2, it can be seen that Wald statistics confirms that in both specifications all the variables are jointly significant, with relatively high share of variables being individually significant as well. Since the likelihood ratio test implies that this model is still statistically different from a simple model with only a constant term, we proceed with discussing the estimation results.

Based on the results presented in Table 2, it can be noticed that the results for male and female subsamples are somewhat similar. Marital status (whether married or previously married) in comparison to single is associated with lower risk of unemployment, while being immigrant and living in urban settlements is positively associated with unemployment, although the latter is not significant for female subsample.

When compared to »Technicians and associate professionals«, regression results have revealed that significantly higher risk of unemployment have following occupations: »Elementary occupations« (the highest estimated marginal effect for male subsample), »Services and sales workers«, »Plant and machine operators, and assemblers« (the highest marginal effect for female subsample), and »Craft and related trades workers«. The only occupation category that has lower risk of unemployment compared to »Technicians and associate professionals« is »Skilled agricultural, forestry and fishery workers«. It should, however, not be automatically concluded that this occupation is unemployment-risk-free. Persons who have previously worked in agricultural activity are more inclined to having higher shares of self-employment (officially registered as employed or not,

since LFS does not put emphasis on formal employment status). The employment status in this sense should not be confused with the relatively increased chances of finding more or less sufficient means for covering living expenses. The methodology of the LFS classifies the individuals as employed if they have been working during the reference period for at least an hour. Therefore, it is possible that the individual »employed« in farming activities according to the LFS methodology is at the same time registered as unemployed by the Croatian Employment Service (CES) register, and considers himself/herself effectively unemployed.

It is interesting to notice that for the male subsample age variable did not prove to be significant, while at the same time older women are facing significantly higher risk of unemployment. Since the coefficient that incorporates non-linearity effect of person's age is also significant (and also negative), the additional women age effect starts decreasing. This implies that older women are considering other options, such as withdrawing themselves into inactivity. One of the mechanisms is through early retirement schemes, as there are age differences in eligibility for retirement between men and women in Croatia.

Another difference in estimated coefficients between male and female population is found within education. Lower education (in comparison to upper secondary) is significant positive covariate for unemployment status in male population, but negative, negligible and insignificant for female population. Therefore, men with lower education are facing significantly higher risks of falling into unemployment. Based on the male subsample we were not able to confirm that an individual with higher education (versus upper secondary) is having

<sup>12</sup> This result is also frequently found in similar regressions, where there is a large unbalance in the number of observations between the two observed categories. See, for instance, Thapa (2004).

statistically significant lower risk of unemployment, while this assumption is clearly confirmed for the female population. The differences between the estimates for male and female subgroups in this respect provide some evidence of gender segmentation on the Croatian labour market.

### **LONG-TERM UNEMPLOYED VS. SHORT-TERM UNEMPLOYED: ARE THEY DIFFERENT?**

In this section we turn our attention to the differences between the short-term unemployed and the long-term unemployed population. The question - are the long-term unemployed in their characteristics different in comparison to short-term unemployed (and if so, whether some policy measures that target long-term unemployment can be designed more efficiently) - is one of the most relevant for future policy measures design.

How long must unemployment duration last in order to be qualified as long-term unemployment can be differently positioned in different countries. For instance, Partridge and Rickman (1998) in the case of the United States consider unemployment of 6 months as long-term unemployment. As a contrast, Eurostat, which publishes statistical data for the European member countries, defines long-term unemployment as longer than 12 months and very long-term unemployment as longer than 24 months. Following this definition, we consider short-term unemployed persons to be those who have been waiting for a job for a period up to a year, long-term those who have been waiting for a job for a period longer than a year and very long-term

those who have been waiting for a period longer than 2 years.

As already presented in Figure 1, Croatia has relatively high share of long-term unemployment. Croatian Employment Service data reveal that the share of the unemployed for a period longer than 2 years in the total number of registered unemployed at the end of 2007 was 44.7 percent, with that percentage almost constantly increasing since 1999.<sup>13</sup> This increasing pressure of the long-term unemployed can have significant impact for the overall labour market policies. The policies aimed at increasing the chances of finding a job that are effective for short-term unemployed, might be completely misdirected in the case of long-term unemployed. Therefore, the analysis of individual characteristics of short-term and long-term unemployed was considered as an interesting research question not addresses in this way in Croatian literature before.

In order to capture the unemployment duration effect, we have divided the whole sample of the unemployed persons in two categories – unemployed for a period up to 1 year (short-term unemployed) and unemployed for a period longer than 2 years (very long-term unemployed). The alternative method dealing with identifying the duration effect would require obtaining the dataset in which the whole period of the unemployment duration is known for each individual (Davia and Marcenaro-Gutiérrez, 2007). However, the LFS data informs us only about the current unemployment duration for the unemployed person, up to the interview period. The data does not provide enough information to speculate how long will each individual be unemployed in the

<sup>13</sup> In 2004 the share of very long-term unemployed decreased compared to the previous year, but this decline did not reverse the trend, as it continued to increase after that year. The number of long-term unemployed is increasing since 1997, and during that period has increased for 60 percent, although the total number of unemployed has started to decrease in 2002.

future.<sup>14</sup> At the same time, for the unemployed sample, there is an opportunity to determine whether there is a link between the duration of the unemployment and the reservation wage of the unemployed. Since the effect of reservation wage<sup>15</sup> on unemployment duration has not been previously analysed in Croatia, this type of extension of the empirical analysis to the analysis of long-term unemployment is considered the second best solution.

All of the variables that were considered as relevant for exploring the differences between the unemployed and employed are a priori considered as relevant for the differences between the short-term and the long-term unemployed. The reason is that if we were to estimate the risk of falling into long-term unemployment on the full sample of data (i.e. including the employed persons), the same set of variables would have been considered. One important addition is the reservation wage, which is not available for the employed persons. Reservation wage is calculated based on the sample data as the wage under which the unemployed person would accept a job in relation to the average wage in the county the unemployed person lives, with average wages calculated separately based on the data in each subsample. Therefore, the reservation wage of an individual is corrected for the gender wage gap<sup>16</sup>, but also for the local labour market conditions, as it is estimated separately for each of the 21 counties in Croatia. Table 3 presents the characteristics of the sample of short-term unemployed and very long-term unemployed.

As already defined for the unemployed-employed regressions sample size, persons with »Unknown occupation«, as well as those with »Armed forces occupations« were excluded from the analysis. However, first-time job seekers were in short-long term unemployed regressions included in the sample, as in the analysis based only on the unemployed sample lack of their previous work experience could not be considered as perfect predictor of dependent variable.

The data presented in Table 3 reveals some interesting differences between the short-term and very long-term unemployed population groups. The very long-term unemployed are on average older, the share of singles decreases in the long-term unemployment population, the share of persons living in urban settlement is higher, they are more frequently registered by the Croatian Employment Service, and the share of the unemployment benefit users significantly decreases.

The female and the male sample have different characteristics, which justifies the separate estimation procedure. The largest differences can be, similarly to the unemployment-employment data presented in Table 1, found in the occupation structures, with certain occupations being traditionally female and other traditionally male dominant. For male population within the very long-term unemployed in comparison to short-term unemployed there is an increased share of all occupational categories except »Service and sales workers«,

<sup>14</sup> As one of the anonymous referees correctly stated – some of the currently short-term unemployed also have the risk of falling into long-term unemployment. However, the sampling method for the LFS has since the year 2007 changed. Since 2007, panel component has been introduced in the sample design and households are repeatedly interviewed four times. The new sample design could enable estimation of the duration models in the future.

<sup>15</sup> In labour economics theory, reservation wage is defined as the lowest wage that will induce a person to enter the labour force (Hyclak, Johnes and Thornton, 2005). In empirical economic literature, reservation wage of unemployed persons is frequently analyzed. See, for instance Franz (1982) or Jones (1989).

<sup>16</sup> For estimates of gender wage gap in Croatia see Nestić (2007).

Table 3.  
Unemployment duration – sample characteristics

	Male		Female	
	<1 year	>2 years	<1 year	>2 years
Age (years):	31.0	40.0	31.8	39.3
In percent of relevant population group				
Married	32.3	45.2	49.8	68.6
Divorced	1.0	3.5	2.1	7.7
Living in urban settlements	51.4	55.1	56.2	57.9
Immigrants	16.9	15.0	10.6	16.6
Registered by the CES	78.9	87.1	86.9	88.0
Unemployment benefit users	18.5	8.8	18.2	8.7
Level of education (percent):				
Lower secondary	19.5	28.2	16.1	24.5
Upper secondary	75.1	61.9	68.1	67.6
Tertiary	3.2	5.6	9.1	4.1
Occupation (percent):				
Managers	2.2	3.2	1.8	1.3
Professionals	1.0	2.3	2.1	3.1
Technicians and associate professionals	3.5	7.9	5.8	4.8
Clerical support workers	2.6	4.1	8.8	8.9
Service and sales workers	14.4	8.8	26.4	20.7
Skilled agricultural, forestry and fishery workers	1.9	0.6	2.1	1.0
Craft and related trades workers	17.9	18.5	2.1	3.3
Plant and machine operators, and assemblers	10.9	15.0	7.0	12.0
Elementary occupation	19.2	12.3	14.3	11.5
First-time job seekers	26.5	27.3	29.5	33.4
Reservation wage (percent of gender specific average)	83.4	78.3	91.2	85.1
Sample size (N)	313	341	329	392

Source: author's calculations based on LFS.

»Skilled agricultural, forestry and fishery workers«, and »Elementary occupations«. For workers with previous job in agriculture, the argument of self-employment may be listed as one of the plausible explanations. However, the decrease in the share for elementary occupations or service sector workers does not lead to straightforward conclusion that persons with these occupations are having increased chances of finding a job and consequently not experiencing longer unemployment spells. The results in unemployment-employment regressions, where these occupations are the ones with higher risk of unemployment, point the dis-

cussion in another direction. Some degree of discouraged worker effect might be offered as part of an explanation for workers with less skill-demanding occupations. These persons may assess that their chances for finding a new jobs are relatively low, and consequently decide to withdraw themselves from the labour market completely. However, the question whether persons in certain occupations are more likely to withdraw themselves from the labour market is left for future research.

The list of occupations with the declining share connected with the unemployment duration for female population is wider,

as it includes two additional categories - »Managers« and »Technicians and associate professionals«. For these categories of occupation, it would be easier to argue that the reason behind the declining share is probably related to the smaller risk of long-term unemployment.

It is also interesting to note that the high share of first-time job seekers remain in the sample of the unemployed for a period longer than 2 years. This means that there is a relatively high share of those without working experience who remain unemployed for a long period of time. As employers are inclined to seek for persons with previous work experience<sup>17</sup>, policy measures designed to provide the unemployed persons with at least some working experience that might help them in obtaining a job would be highly recommendable.

Sample inspection also reveals that lower levels of education have increasing share in the population of very long-term unemployed as compared to short-term unemployed. For male subsample, increased share in the population of unemployed for a period longer than 2 years also have the persons with tertiary education, while their share in female subsample is declining. In general, one would expect that there is an increased demand for highly educated or at least that the highly educated are flexible enough to be able to adjust to the demand shifts, so that these population groups would not suffer from long unemployment spells. However, if highly educated are coming from declining industries that are shedding labour due to restructuring, then only higher education might not be adequately strong enough to prevent longer unemployment spells, as occupation of an individual is more relevant factor that increases the person's chances of finding a job.

The most interesting information in Table 3 is related to the average relative reservation wage. The unemployed on average expect lower wage than it predominately is on their local labour market, and as the duration of the unemployment increases, they become willing to accept a job for smaller wage. This confirms that in general there is a link between the duration of the unemployment and the reservation wage. It also seems that unemployed women form their reservation wages closer to the average wage in general, i.e. they do not consider gender specific average wages and do not include the existing gender wage gap.

We proceed with presentation of the estimation results, which were carried out within the probit model framework. In addition to the previously defined sample, all individuals that did not report their reservation wage were excluded from the sample used for estimation. The estimation sample includes short-term unemployed (up to one year) and very long-term unemployed, with the latter being dependent variable. The results of the estimation are presented in Table 4.

In comparison with the unemployment-employment regression (Table 2), it can be noticed from the estimates of the regressions presented in Table 4 that the fit of the model is in general better. This is related to the fact that the sample is more balanced (the number of short-term and long-term unemployed in the sample is similar), and in this case we were able to adequately classify the dependent variable based on the model estimates.

For both population subgroups, when controlled for other covariates, age turned out to be significant and positively associated with the probability of long-term unemployment, the results being in line with

<sup>17</sup> Gorter, Nijkamp and Rietveld (1993) have found out that for the unemployed lack of previous work experience is a stronger disadvantage than lack of education.

Table 4.  
*Probit estimation, predicting very long vs. short-term unemployment*

	Male population		Female population	
	Estimated coefficients (robust standard errors)	Marginal effects (at x-bar)*100	Estimated coefficients (robust standard errors)	Marginal effects (at x-bar)*100
Constant	-5.08*** (0.74)		-5.72*** (0.73)	
Age	0.24*** (0.04)	<b>0.10</b>	0.27*** (0.04)	<b>0.11</b>
Age-squared/100 (robust standard error/100)	-0.23*** (0.04)	<b>-0.09</b>	-0.28*** (0.05)	<b>-0.11</b>
Marital status (vs. single)				
Married	-0.43*** (0.16)	<b>-0.17</b>	-0.03 (0.15)	-0.01
Divorced	0.02 (0.39)	0.01	0.59* (0.32)	<b>0.22</b>
Living in urban settlements	0.04 (0.11)	0.01	0.02 (0.11)	0.01
Immigrants	-0.13 (0.14)	-0.05	0.06 (0.16)	0.03
Logarithm of reservation wage	-0.37* (0.21)	<b>-0.15</b>	-0.07 (0.18)	-0.03
Registered by Employment Service	0.20 (0.16)	0.08	0.02 (0.16)	0.01
Level of education dummy variables (vs. upper secondary education):				
Lower secondary	0.20 (0.14)	0.08	-0.13 (0.14)	-0.05
Tertiary	-0.23 (0.25)	-0.09	-0.84*** (0.20)	<b>-0.32</b>
Occupation dummy variables (vs. Technicians and associate professionals):				
Managers	-0.25 (0.45)	-0.10	-0.52 (0.44)	-0.20
Professionals	-0.02 (0.47)	-0.01	1.03** (0.40)	<b>0.33</b>
Clerical support workers	-0.21 (0.35)	-0.08	-0.08 (0.30)	-0.03
Service and sales workers	-0.70** (0.30)	<b>-0.27</b>	-0.22 (0.28)	-0.09
Skilled agricultural, forestry and fishery workers	-1.49** (0.60)	<b>-0.45</b>	-0.31 (0.49)	-0.12
Craft and related trades workers	-0.71** (0.28)	<b>-0.27</b>	-0.14 (0.41)	-0.06
Plant and machine operators, and assemblers	-0.43 (0.30)	-0.17	-0.07 (0.30)	-0.03
Elementary occupation	-0.93*** (0.30)	<b>-0.35</b>	-0.36 (0.29)	-0.14
First time job seekers	0.66** (0.29)	<b>0.25</b>	1.10*** (0.28)	<b>0.40</b>
Diagnostics				

Continuation of Table 4.

N	648	708		
LogL	-357.97	-393.53		
Wald (19) chi <sup>2</sup>	133.06***	139.20***		
Pseudo R <sup>2</sup>	0.20	0.19		
Prediction (%)	73.77	70.90		
Hosmer-Lemeshow	18.10	18.26		
Classification table		True		True
Classified	Long	Short	Long	Short
Long	271	102	303	124
Short	68	207	82	199

Source: author's estimates.

Note: Coefficients marked \*\*\* are significant at level of 1%, \*\* at level of 5%, and \* at level of 10%

Marginal effects are evaluated at the mean of the sample data. The marginal effect of specific variable is expressed as the percentage point changes from this level of the predicted probability of very long-term unemployment at the mean of the data. For dummy variables, the marginal effect represents the change in the probability of very long-term unemployment for persons with and without that characteristic, holding other characteristics constant at the same time.

the sample characteristics, which reveal that the average age of the very long-term unemployed is higher than short-term unemployed. However, due to the non-linearity in the relationship, the probabilities are not equally high for the persons who are in population groups eligible for retirement. When there are other options, in most cases those leading away from the labour market into the inactivity, the probability that the unemployed will continue to actively seek for a job is, naturally, lower. Therefore, older unemployed have higher probabilities of facing longer unemployment spells, and the results in Table 2 confirm that, at least for the female population, they have higher probabilities of falling into unemployment as well. This means that once the older individuals have become unemployed, they are very likely to stay unemployed for longer time periods. For some of them the unemployment spell will last until retirement. In particular so if they consider their chances of employment to be low, and if the ratio between the unemployment benefits they

could receive and the pension coming from the early retirement scheme is lower.

The only other similar significant covariate for long-term unemployment for male and female subsample can be found in first-time job seekers variable. The results of the estimates reveal that, in comparison to »Technicians and associate professionals«, unemployed persons who have no previous work experience have higher probability of facing longer unemployment spells.

Marital status was a significant predictor for unemployment status, but when it comes to predicting very long-term unemployment, there are certain specificities. The married still have lower probabilities of very long-term unemployment (in comparison with single population), although this variable is significant only for male population. The divorced variable is, contrary to the results of the unemployment-employment regressions, a positive predictor of long-term unemployment, although significant only for female population.



For predicting very long-term unemployment, being registered by the Croatian Employment Service is not significant, although their share is increased in very long-term unemployed population (Table 3). Similar results can be found for persons living in urban settlements, and immigrants. It is, however, interesting to notice, that sign of the immigrant variable for male population turned out to be negative. Therefore, although we were able to confirm that immigrants are facing higher risks of falling into unemployment in Croatia, we were not able to confirm that they will be facing longer unemployment spells.

When it comes to education, all the variables show the same signs as in unemployed-employed regressions. However, for male population none of them turned out to be significant. The only significant education predictor of very long-term unemployment can be found for female population, where persons with higher education (versus upper secondary) are less likely to be unemployed for longer periods of time.

The estimated coefficient for the logarithm of the reservation wage has the same sign for both population subgroups, but turned out to be significant only for male population. Since the reservation wage is defined relative to specific population subgroup and relative to the local labour market, this result reflects the sample characteristics. Long-term unemployed correct their wage expectations, but their willingness to accept the job for relatively lower wage (as the duration of the unemployment increases) is not a strong enough reason for the employers to employ them.

It is interesting to review the results of estimated coefficients for occupation variables, which are not necessary the same occupation in which the unemployed person is seeking a job, but rather relate to the occupation the unemployed had while they were working. Relative to »Technicians and

associate professionals«, lower probability of becoming long-term unemployed in male population have »Skilled agricultural, forestry and fishery workers«, »Elementary occupations«, »Service and sales workers« and »Craft and related trades workers«. It is interesting to notice that the same occupations were significant predictors of unemployment versus employment status. However, only »Skilled agricultural, forestry and fishery workers« was negative, while all others were significant positive predictors of unemployment. The explanation for agricultural activity, as well as elementary occupations, has already been offered in terms of self-employment and discouraged worked effect. The self-employment argument can be extended to crafts sector, as those individuals who are more likely to lose a job can be also more inclined to self-employment and not prolong their unemployment status, respectively. For »Service and sales workers« seems that, although they have higher probability to lose a job in comparison to »Technicians and associate professionals«, at the same time they have smaller probability to experience longer unemployment. Since the published CBS data reveal that employment in trade and service sector is increasing in the last few years, the demand for these types of workers is probably the reason why they do not on average stay unemployed for longer time periods. This confirms the intuition that mechanisms preventing long-term unemployment for persons with different previous occupations are altered.

For the female subsample, only »Professionals« have a significantly higher probability for experiencing longer unemployment spells relative to »Technicians and associate professionals«. Since this occupation was not a significant predictor for the unemployment status, it seems that women professionals (relative to technicians and associate professionals) are not likely to lose a job, but when they do, their

probability of staying unemployed for a longer period of time is higher.

## CONCLUSIONS

The paper explores the differences between the unemployed and employed on the Croatian labour market based on their individual characteristics, which contributes to the available literature in Croatia, as the unemployment issue was previously addressed mainly on the aggregated level (Katić (2006), Bejaković and Gotovac (2003)). Empirical estimation was based on Labour Force Survey data for the year 2006 and the analysis was performed separately on male and female subsample.

The results have shown that, when it comes to the risk of falling into unemployment, there are no significant differences in predictors for male or for female population. The usual characteristics relevant in other countries are important predictors of the risk of falling into unemployment for Croatian population as well. There are, however, certain specificities. The age variable is a positive predictor of unemployment only for female population (with decreasing positive effects as women approach the age when retirement might be an option), contrary to the assumption that older population is at higher risk of falling into unemployment in general. Higher education (versus upper secondary) is a significant negative predictor of the unemployment status for female, while lower education is positive predictor for male population. The fact that higher education in general was not confirmed as the method of alleviating higher risk of falling into unemployment requires further research efforts.

When the characteristics of very long-term unemployed are compared to the short-term unemployed, it is interesting to note that significant positive covariate for very long-term unemployment for both subsamples can be found for first-time job

seekers. The results of the estimates reveal that, in comparison to the unemployed who have been previously employed as »Technicians and associate professionals«, unemployed persons who have no previous work experience have higher probability of facing longer unemployment spells. This result requires special attention, in particular when the age structure of long-term unemployed is considered. Matković (2008) reports that during the period 2004-2006, 45 percent of young persons have been unemployed for a period of longer than a year. Since the skills the individuals possess might deteriorate if they are not using them actively, the situation where young persons after graduation are not being able to actively use the knowledge they have acquired, implies that the available human resources are not being used efficiently in Croatia. If the results of research in other countries are added as an argument, where employers prefer employees with previous working experience (Gorter, Nijkamp and Rietveld, 1993), the relative position of the first time job seekers on the labour market seems highly vulnerable.

Reservation wage is a significant negative predictor for very long-term unemployment for male subsample. The higher the reservation wages relative to the average wage on the local labour market, the lower the probability of the long-term unemployment status of an average individual in the sample. Although this result is interesting, the conducted analysis does not allow exploring the causality between the reservation wages and the duration of unemployment. It can only confirm that the longer the person is unemployed, the lower his reservation wage is. However, the adjustment mechanisms of the reservation wages are left undetermined.

The strong significance of the occupation variables in both unemployed-employed, as well as short-long term unemployed estimates, are probably related to the

structural mismatch on the labour markets in transition countries in general, which has been previously emphasized in Croatia as well (Obadić, 2006). The large proportion of the unemployed on the Croatian labour market is probably due to structural factors, and not the result of frictional or cyclical patterns. The large and persistent share of long-term unemployment is precisely the indicator of structural problems. Therefore, the significance of the occupation variables, even though they are included in a much-aggregated manner, is highly expected.

The specific occupations predicting the unemployment status are the same for both subsamples, while the occupations related to longer unemployment spells are gender specific. In addition to confirming the assumption of traditional division of occupations into female and male occupations (Matković, 2008), this result also implies a certain degree of labour market segmentation in Croatia. It seems that certain occupations are closed-in, meaning that the probability of losing a job is not high, but at the same time for the unemployed persons who have previously worked in these occupations, the probability of staying unemployed for a longer period of time once the job is lost is high.

The empirical analysis has shown that the probability of becoming long-term unemployed is higher if a person is older (although for those close to retirement, there is an exit route into inactivity), has no previous work experience or comes from certain previous occupations. The first two results are common to most empirical studies on the unemployment duration, while the latter result is related to the structural mismatch on the Croatian labour market. Namely, fast restructuring due to transition process has »produced« the unemployed who are not able to find a job in similar (diminishing) occupations (industries, activities), who possess the skills frequently not required by the labour market and are not able to acquire

new skills in a short period of time. Therefore, the duration of their unemployment is relatively longer. If the policy measures are not designed in a manner that would allow those population groups to acquire the skills demanded by the growing industries, and if the unemployed are not eager to adapt to the changes, the high share of the long-term unemployment in Croatia will persist as one of the key labour market issues.

In this paper, the results of the estimations are based only on the dataset for one year. Darby, Haltiwanger, and Plant (1985) argue that the job finding probability declines during recessions, because workers who become unemployed during recessions are different than workers who become unemployed during expansions. According to Shimer (2007), there are substantial fluctuations in unemployed workers' job finding probability at business cycle frequencies, while the probability that a worker exits employment is comparatively acyclic. To be able to reveal underlying trends on the Croatian labour market with respect to individual's characteristics, an analysis of a longer time span, as well as the comparison of the results through time would be desirable. This is, however, left for some future research.

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**Sažetak**

**NEZAPOSLENI I DUGOTRAJNO NEZAPOSLENI U HRVATSKOJ:  
ANALIZA NA TEMELJU ANKETE RADNE SNAGE**

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*U radu se analiziraju razlike između karakteristika zaposlenih i nezaposlenih na hrvatskom tržištu rada. Analiza je provedena na temelju podataka ankete o radnoj snazi Državnog zavoda za statistiku za 2006. godinu. Poduzorak ženske i muške populacije je analiziran odvojeno. Rezultati pokazuju da su zanimanje, imigrantski i bračni status nezaposlenih osoba signifikantni prediktori nezaposlenosti za obje populacije, dok kod obrazovanja, dobi i stanovanja u urbanim sredinama postoje određene rodne razlike.*

*Dodatno pitanje koje je istraženo u radu je – postoje li razlike između dugotrajno i kratkotrajno nezaposlenih. Rezultati provedene empirijske analize pokazali su da pored specifičnih zanimanja i bračnog statusa, za obje je populacije dob signifikantna. Uvjetna nadnica je dodatno signifikantna za mušku, a obrazovanje za žensku populaciju.*

**Ključne riječi:** nezaposlenost, dugotrajna nezaposlenosti, Hrvatska.