Determinants of Youth Unemployment in Russian Regions

Olga Demidova* and Marcello Signorelli**

Abstract

The main purpose of this paper is to analyze the main determinants of the youth unemployment rates in Russian regions.

In the second section we review the relevant literature. It should be noted that the literature on youth unemployment at regional level is still quite scarce, in general, and it is extremely rare for the case of Russia. The third section is based on a panel data (ROSSTAT) for 75 Russian regions during the period 2000–2009. The first part of this section consists of key descriptive evidences, while the second part contains some econometric results (panel analysis) for different models. In the econometric estimations we adopt two different dependent variables and a large set of explicative (and control) variables. In the final section the key results and policy implication are presented.

Key words: regional youth unemployment, Russian labour market
JEL Classification: G01, R23, E24

1. Introduction

In many countries, youth unemployment dramatically rose after the recent global economic crisis (ILO, 2010a; Arpaia and Curci, 2010; Choudhry et al., 2011; Demidova and Signorelli, 2011).

However, it should be noted that, also in "good times" the integration of young people into the labour market is an important objective all over the world, due to the generally high and persisting youth unemployment rates. For example, in European Union, youth unemployment rates are generally more than twice as high as the adult rates, with significant differences across countries (Quintini et al., 2007) and regions (Perugini and Signorelli, 2010a and 2010b).

The main purpose of this paper is to analyze the main determinants of the ratio

* Department of Economics, University – Higher School of Economics, Moscow, Russia; e-mail: demidova@hse.ru
** President of the *European Association for Comparative Economic Studies*; Department of Economics, Finance and Statistics, University of Perugia, Italy, e-mail: signorel@unipg.it

between youth and total unemployment and the dynamics of youth unemployment rates in Russian regions.

In the second section we review the relevant literature regarding the Russian labour market, the determinants of youth and regional unemployment, and the very few studies on youth regional unemployment in Russia and other transition countries. It should be noted that, as to our knowledge, there are only few studies (e.g. Green et al., 2001; Perugini and Signorelli, 2010a and 2010b) investigating youth labour market performance at regional level (in the European context). In addition, the literature on youth unemployment in Russian regions is extremely rare (e.g. Demidova and Signorelli, 2011). The third section is based on a panel data (ROSSTAT) for 75 Russian regions during the period 2000–2009. The first part of this section consists of key descriptive evidences, while the second part contains some econometric results (panel analysis) for different models. Although the main objective is to detect the structural factors determining higher regional youth unemployment rates, the effect of 2008 crisis is also partly investigated. In the econometric estimations we adopt two different dependent variables (unemployment rate in 20-29 age group and the ratio between youth and total unemployment rates) and a large set of explicative and control variables. In the final section the key results and policy implication are presented.

2. Literature Review

In this section we briefly review the literature (i) on Russian labour market, (ii) on youth unemployment in general and with respect to the impact of the crises and, finally, (iii) on regional youth unemployment.

2.1. Review of the Literature on Russian Labour Market

A very recent research (Kapelyushnikov et al., 2011) presents a complete review of the relevant literature on Russian labour market. But, more important, the above study highlights some key factors influencing labour market practices in a transition economy. In particular, in order to explain the high stability of the aggregate employment (and unemployment) level over time, they establish a link between inefficient enforcement and the emergence of compensating institutional arrangements on the one side and the unusually broad implementation of flexible working time and flexible pay on the other side. In fact, a characteristic of the Russian labour market is that employment (and unemployment) has

always been relatively stable despite a sequence of relevant economic shocks[1]. As a consequence of this persisting characteristic, since the early stage of transition, some authors start talking about "the Russian way" (Layard and Richter, 1995). Kapelyushnikov et al. (2011) find a key explanation on the prevalence of flexible working time and flexible pay that make possible to offset pressures on the labour market (during a crisis) without a drastic readjustment of employment. Similarly, during the phases of economic growth the ability to increase working hours and pay boost output and productivity, reducing the need to hire more workers. The authors argue that flexible working hours and pay are not the prerogatives of the Russian labour market; what distinguishes Russia is the persistence, depth and scale of these phenomena and their institutional embeddedness. In other terms, Kapelyushnikov et al. (2011) argue that the current model of labour relations in Russia is a combination of very stringent formal rules embodied in the Labour Code and the great variety of informal arrangements that make it feasible to 'soften' these rules or circumvent them altogether. So, external shocks are absorbed by means of high "internal flexibility" (shortening working hours) and wage flexibility. This is substantially flexible system, notwithstanding the formal rules are numerous and stringent. In other terms, the overall flexibility comes from the willingness and ability of both employers and employees to curtail their exposure to formal rules and rely on informal arrangements.

Similar assertions confirmed by numerical calculations were made in the papers Gimpelson et al. (2010) and Kapelyushnikov (2011). The latter author argues that although labor regulation in Russia is *de jure* very flexible, alternative estimates suggest that by stringency of EPL Russia exceeds even those OECD countries whose labor markets are considered overtly overregulated.

Comparison of the labour market in Russia and other countries was performed in Gimpelson et al. (2011). The authors concluded that current Russian model of labor market differs from that observed in other European countries, with the exception of the CIS.

The key importance of "internal flexibility" during a crisis has been already stressed in Demidova and Signorelli (2011). It should be noted that also acording to previous studies, law implementation has been extremely flawed in Russia (e.g. ILO, 1997; Feige, 1997; Vishnevskaya and Kapelyushnikov, 2007), favouring the creation of a vacuum of formal regulations and the diffusion of informal rules. Preliminary evidences on the impact of last crisis seem to confirm the high stability of employment (and unemployment) level(s).

[1] Differently from the Central and Eastern European Countries, in Russian case the correlation between changes in GDP and employment dynamics has been very weak.

2.2. Review of the Literature on Youth Unemployment

First of all, it should be noted that although official statistics tend to focus on the group aged 15-24[2], there is a debate about the various definitions of youth (e.g., Lefresne, 2003; O'Higgins, 1997). In general, employment rate indicators are better than unemployment rates, but this does not hold for "young people" considering the difficulties to take in to account of the differences and changes in the "schooling participation"[3]. In addition, in the case of youth unemployment, some specific problems, such as underemployment and informal sector employment, may be relevant (O'Higgins, 2005). O'Higgins (2011a and 2011b) also highlights the advantage of considering the percentage of youth not working and not in education or training (NEET).

Many macroeconomic and institutional factors contribute to the youth labour market performance. Both total and youth unemployment depends significantly on macroeconomic cyclical conditions; however, macroeconomic performance and cyclical behaviour cannot explain the existence of a youth unemployment rate persistently higher than adult (or total) unemployment rate. The main reason of the generally worse youth labour market performance with respect to adults is related to the lower level (and/or different quality) of human capital (and productivity) of the young. It should be noted that the educational level is the most immediate variable measuring "human capital", but young people lack the other two components of human capital, namely generic and job-specific work experience. Carmeci and Mauro (2003) have shown that educated youngsters need to acquire firm-specific knowledge by working activities for "schooling" human capital to become productive.

The impact of the institutional framework has been stressed by many authors (e.g. Brunello, Garibaldi, & Wasmer, 2007; Checchi, 2006; European Commission, 2008 chapter 5; Newmark & Wascher, 2004; Kolev & Saget, 2005; Bassanini & Duval, 2006; Booth, Francesconi, & Frank, 2002; Heckman and Borjas, 1980; Clark and Summers, 1982; Quintini & Martin, 2006; Abowd at al., 1997, Neumark & Wascher, 1999; Ryan, 2001; Ichino, Mealli, & Nannicini, 2005; Barbieri & Sestito, 2008; Picchio, 2008).

In particular, the school-to-work transition (STWT) processes and their determinants and changes over time have been widely investigated in the literature (e.g. Caroleo and Pastore, 2003 and 2007; O'Higgins, 2005; Sciulli and Signorelli, 2011; Checchi, 2003; Brunello-Checchi, 2005; Rodriguez-Pose, 2003; ILO, 2002).

---

[2] As for a more complete definition of "youth unemployment" and some measurement aspects, see also ILO (2009). See also the empirical evidences presented in ILO (2010a, 2010b).

[3] In other terms, a lower or/and decreasing youth employment rate is significantly related to high(er) "schooling participation". Obviously, in interpreting empirical evidence, it should be consider that YURs are affected by all the problems related to general unemployment rates - in particular, the definition of unemployment and the role of discouragement effects (e.g. Perugini and Signorelli 2004 and 2007).

Other researches refer to the effects of demographic composition and changes (e.g. Flaim, 1990; Shimer, 1999; Korenman and Neumark, 1997).

2.3. Review of the Literature on Youth Unemployment and the Crises

The literature on the impact of "economic and financial crises" on youth unemployment is still quite scarce (e.g. Choudhry et al., 2011; Demidova and Signorelli, 2011; Marelli et al., 2011). Scarpetta, Sonnet and Manfredi (2010) highlight that the crises exacerbate the structural problems that affect the transition from school to work. In fact, during and after a crisis, the decline in GDP turns - with a delay of some months - into a reduction of labour demand; in this situation, school-leavers are competing with more jobseekers for fewer vacancies[4], while the youth already in the labour market are generally among the first to lose their jobs, mainly due to the higher diffusion of temporary contracts[5], with a consequent high difficulty to get another one (OECD, 2009)[6]. The labour hoarding practices, especially in countries with the highest EPL on "permanent contracts", favour adult segments and can further increase the size and duration of the impact of the crisis on youth unemployment. Generally, "education matters" and the consequences of a crisis are usually more serious for low-skilled youth, already in great difficulties in good times, since the crisis further increases their risk of long-term inactivity and exclusion. Many authors find that a "scarring" effect of unemployment on youth depends on overall labour market conditions, but it is significantly higher for disadvantaged youth (e.g. Bell & Blanchflower, 2009). In any case, adopting the definitions of Quintini and Manfredi (2009), the crisis is pushing more and more youth, even those who have performed well in good times, into the group of "poorly-integrated new entrants" and possibly in to the group of "youth left behind"[7]. In particular, Scarpetta et al. (2010) highlight the risk to have a "lost generation" and the need to adopt effective (active and passive) labour policies and STWT institutions for minimizing the increase in the number of youth losing effective contact with labour market and permanently

[4] As mentioned in the previous section, the existence of a "youth experience gap" favors a higher employability of adult (with generic and sector specific skills) with respect to youngsters.

[5] The higher diffusion of temporary contracts between youngsters leads to the adoption of a sort of "last-in first out" rule.

[6] So, the high diffusion of temporary contracts is a key explanation of the higher business-cycle sensitivity for youth in the labour market. However, many authors (e.g., Cockx & Picchio, 2009; Scarpetta et al., 2010) notice also that—for many youth—temporary contracts (especially apprenticeship) are more often a stepping stone to a permanent contract than a "trap". The trap effect of temporary contracts seem to be higher in countries with a large difference in the stringency of regulations for permanent contracts (i.e., strict "employment protection legislation", EPL) as compared to temporary (or other atypical) contracts.

6 According to Scarpetta et al. (2010), the size of the group of "youth left behind" can be proxied by the number of young people who are neither in employment, nor in education or training (NEET). This group represented 11% (on average) of 15-25-years-old in the OECD in 2007.

[7] According to Scarpetta et al. (2010), the size of the group of "youth left behind" can be proxied by the number of young people who are neither in employment, nor in education or training (NEET). This group represented 11% (on average) of 15-25-years-old in the OECD in 2007.

damaging their employment prospects. Verick (2009) further confirms that-during and after a severe recession-young people find increasingly difficult to both acquire a job as a new entrant in the labour market, especially as a consequence of hiring freezes, and to remain employed, since they are more likely to be laid off than workers with more seniority. So, the youth unemployment rates are more sensitive to the business cycle than witnessed for adult (OECD, 2008). Arpaia and Curci (2010) produce a wide analysis of the labour market adjustments in EU-27 after the 2008-2009 recession (in terms of employment, unemployment, hours worked and wages) and they also highlight that workers with weaker work contracts and a lower qualification and experience have borne the brunt of the "great recession", with a consequent huge increase in youth unemployment rates[8]. Choudhry et al. (2011) investigated the effect of financial crises on youth unemployment rates during the period 1980-2005 for a large number of countries (about 70) and obtained that crisis impact on youth unemployment rate is significant and robust and persist till five years after the crisis.

O'Higgins (2011b) extensively investigates the impact of the economic and financial crisis and the policy response on youth employment in the European Union. In particular, he argues that it is not so much that more young people are affected, but that young people are more affected, by the crisis. In other terms, young people tend to be harder hit than adults by recessions, but the problem is not just that young people's unemployment rate rise more than adult rates during a recession. According to O'Higgins (2011b) the main point is that young people who are caught by the crisis are more vulnerable to its effects than are adults and that these effects are likely to be more long-lasting for young people. He finally argues that although the youth unemployment rate provides crucial information on the labour market situation of young people, it is also important to look at what is happening to other indicators to gain some understanding of what are the likely consequences of a crisis. In particular, youth joblessness in addition to youth unemployment is an issue of concern in that it is associated with long-term labour market withdrawal and social exclusion[9].

2.4. Literature on Regional (Total and Youth) Unemployment

As to our knowledge, there are only few studies (Green, Owen, & Wilson, 2001; Perugini & Signorelli, 2010a, 2010b) investigating youth labour market performance at

[8] Considering the complex relationship between unemployment, employment and participation rates (see, for example, Perugini & Signorelli, 2004, 2007), it should be noted that - especially during and after a crisis - the increase in (youth and total) unemployment rates can undervalue the negative impact if the possible decrease in the (youth and total) participation rates is not adequately considered. This is the well known "discouragement effect" (usually more relevant for women) that produce a reduction of the actual labour force and - especially in the case of young people - can partly consist in an increase in the duration of "education".

[9] More generally, the quality of employment is also important.

regional level (in the European context) and there are very few studies regarding the Russian case (Demidova and Signorelli, 2011). The latter research finds econometric evidence also on the role played by the level of regional development and by the impact of the 1998-99 Russian crisis.

So, with few exceptions, in the existing literature the two subjects of youth and regional labour markets have generally been considered as separate topics. In fact, the regional dimension of (total) unemployment has been largely considered since the work of Blanchard and Katz (1992). As highlighted in Marelli et al. (2011), regional unemployment differentials are wide and persistent; low unemployment regions tend to cluster close to each other; moreover, such differentials show a clear and persistent core-periphery pattern (EC, 2002), since high and persistent unemployment is concentrated in peripheral regions. Elhorst (2003) present a survey on regional unemployment. Several recent studies highlight various aspects (e.g. Basile and De Benedectis, 2008; Marelli, 2006; Izraeli and Murphy, 2003; Longhi et al., 2005; Belke and Hein, 2006; Belke, 2007; Marelli and Signorelli, 2010a; Fatàs, 1997; Jurajda and Terrell, 2009; Vamvakidis, 2009; Gács and Huber, 2005; Galbraith and Garcilazo, 2010; Garcilazo and Spiezia, 2007; Overman and Puga, 2002). A comprehensive survey on regional labour market developments in transition countries can by found in Huber (2007). A more specific research, by Tyrowicz and Wòjcik (2010), investigates convergence in regional unemployment rates of three transition countries. Bornhorst and Commander (2006) investigate the persistence of regional unemployment rates in six major transition countries. Finally, Marelli and Signorelli (2010b), in order to explain employment growth in a large sample (at the NUTS-3 level of disaggregation) of regions in eight transition countries, included an index of "progress in transition" (computed from the EBRD statistics).

3. Data, Descriptive Statistics and Econometric Results

The data are taken from ROSSTAT and refer to 75 Russian regions for the period 2000-2009. In addition to the two dependent variables (regional youth unemployment rate and the ratio of youth and total regional unemployment rate), a very large set of regional variables are considered in the econometric estimations (a detailed list of variables is presented in Appendix).

In the following Tables 1 and 2 some key descriptive evidences are presented. It is confirmed a ratio of youth and total unemployment rates higher than one (1.47 in 2009) and a wide range in the regional youth unemployment rates (from a minimum of 4.2 to a maximum of 27.86 in 2009).

Table 1. Comparison of Youth and Total Unemployment Rate

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mean for Total unemployment rate	11.77	10.02	8.85	9.29	8.85	8.19	7.75	6.7	7.31	9.16
Mean for Ratio of youth and total unemployment rate	1.35	1.37	1.34	1.35	1.19	1.38	1.43	1.45	1.41	1.47

Source: our elaboration on ROSSTAT data

Table 2. Descriptive Statistics for Youth Unemployment Rate

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mean	15.84	13.53	11.68	12.49	10.5	11.1	10.99	9.48	10.06	13.18
Median	14.93	12.67	10.58	12.46	9.61	9.88	10.37	8.66	9.35	12.74
Min	4.9	3.42	2.59	1.68	2.5	1.4	2.44	2.06	1.26	4.2
Max	33.71	31.85	26.48	31.91	26.46	30.29	29.74	27.56	24.91	27.86
Coef.Var.	0.36	0.36	0.38	0.42	0.48	0.44	0.48	0.52	0.43	0.27

Source: our elaboration on ROSSTAT data

The results in the table 3 suggest a positive (and persisting over time) spatial correlation in the "youth unemployment rates" for the bordering regions and negative distance spatial correlation. These results suggest the inclusion of spatial lags of dependent variable in all our models. Considering that these variables are endogenous, we adopt the Arellano-Bond Dynamic Panel GMM estimators. In addition, to avoid the problem of data multicollinearity, we included only part of the control variables in each model.

Table 3 . Dynamics of Moran's Spatial Correlation Index for the variable youthunem

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Moran's I1 a)	0.306***	0.306***	0.249***	0.307***	0.41***	0.201**	0.332 ***	0.431***	0.372***	0.318***
Moran's I2 b)	-0.086***	-0.059***	-0.042***	-0.062***	-0.118***	-0.059***	-0.072 ***	-0.071***	-0.073***	-0.074***

Source: our elaboration on ROSSTAT data

Note:

a) with boundary weighted matrix
b) with auto weighted matrix (matrix elements - the normalized distance between the capitals of the regions by road)

*** - significant at 1%, ** - significant at 5%, * - significant at 10%

In Table 4 a first set of econometric results is presented by considering the regional youth unemployment rate as dependent variable and the following as explanatory and control variables: (i) regional total unemployment rate, (ii) share of urban population in the total population, (iii) share of population aged 20-29 (in total population age 15-72), (iv) number of students in public higher education institutions (per 10000 inhabitants), (v) number of pensioners in the region (per 1000 inhabitants), (vi) the number of registered crimes (per 100,000 inhabitants), (vii) several regional migration rates, (viii) gross regional product in the previous year per capita corrected for the different "purchasing power", (ix) average monthly pensions corrected for the different "purchasing power", (x) several index of

openness of the regional economies. In addition, all the models contain "auto spatial lag" or "boundary spatial lag" and year dummies.

Table 4. Determinants of youth unemployment (the results of the estimation of the models with the dependent variable "youthunem")

Model	Y1a	Y1b	Y2a	Y2b	Y3a	Y3b	Y4a	Y4b	Y5a	Y5b
Time lag	0.00	0.01	-0.01	0.00	0.01	0.00	-0.01	-0.01	0.00	0.00
Auto Spatial lag	-1.91***		-2.28***		-1.96***		-1.98***		-1.93***	
Boundary Spatial lag		0.18***		0.20***		0.18***		0.19***		0.19***
totun	1.02***	1.06***	0.99***	1.05***	1.03***	1.08***	1.02***	0.03***	1.04***	1.08***
d2002	-5.49***	-1.42***	-6.58***	-0.79***	-5.52***	-0.55***	-5.48***	0.17***	-5.47***	-0.50***
d2003	-2.23***	-2.00***	-3.04***	-0.54**	-2.31***	-0.15	-2.11***	0.25	-2.32***	-0.13
d2004	-7.01***	-1.47***	-8.54***	-1.46***	-7.23***	-1.12***	-6.98***	0.31***	-7.31***	-1.17***
d2005	-5.51***	-2.37***	-7.21***	-0.56**	-5.75***	-0.04	-5.36***	0.38	-5.90***	-0.25
d2006	-4.87***	-1.36***	-6.78***	-0.12	-5.20***	0.55**	-4.69***	0.46*	-5.35***	0.30*
d2007	-8.06***	-0.73***	-10.63***	-0.26	-8.47***	0.52	-7.69***	0.66	-8.65***	0.20
d2008	-6.76***	-0.72***	-9.32***	-0.41	-7.35***	0.43	-6.24***	0.86	-7.72***	-0.07
d2009	0.19	-0.71***	-1.37***	0.04	-0.35	0.96***	1.50	1.26	-0.90***	0.35
shurban	0.00	0.01								
shareyouth	-0.39***	-0.38***								
students	0.00	0.00								
numberpension	0.00*	0.00**								
regcrim	0.00	0.00								
migrate			0.01**	0.01***						
miginotherreg			0.01	0.01						
miginabroad			-0.01	-0.01						
migoutotherreg			-0.02	0.01						
migoutabroad			-0.10	-0.04						
gdppercappp					-0.00*	-0.00**				
pensionpp							-0.00**	-0.00		
openexpcis									1.67	-1.24
openimpcis									3.61	5.98
openexpoth									-1.51***	-1.49**
openimpoth									0.44***	0.48***
AB test AR(2)	0.27	0.14	0.3	0.2	0.29	0.25	0.19	0.11	0.36	0.29
AB test AR(3)	0.48	0.5	0.41	0.5	0.53	0.55	0.54	0.57	0.44	0.47
Sargan test	39.08	33.03	39.21	32.11	36.1	31.34	36.81	32.46	39.2	32.52

Source: our results on ROSSTAT data

Note: *** - significant at 1%, ** - significant at 5%, * - significant at 10%

In short, the main results can be summarized and interpreted as follow: (i) the existence of stable spatial correlation for youth unemployment in Russian regions (negative for distance and positive for bordering regions) is clearly detected; (ii) it's necessary take into account the temporal dynamics of youth unemployment (in 2004, in the middle of two crises - 1998 and 2008 - the level of youth unemployment rate fell, and in 2008 and especially in 2009, during the second economic crisis has grown); (iii) the coefficient of variable "totun" exceed 1 in all models, highlighting a more serious situations with youth unemployment with respect to total unemployment rate; (iv) the higher the share of the young people in the population of the region the lower the level of youth unemployment (this result is opposite with respect to the results for other countries); (v) there are two possible explanations of the positive coefficient of the variable "numberpension": retired people may compete with young people for job or at the same time presence of a pension in the family permit a young people to stay in unemployment for a longer period; (vi) migration aggravates the problem of youth unemployment, as migrant workers compete with young people for the available vacancies in

the labor market; it should be considered that migrant workers are often willing to work for lower wages, under the worst working conditions; (vii) the higher the level of economic development in the region (which is expressed in a higher value of GDP per capita corrected for the different "purchasing power"), the lower the level of youth unemployment; (viii) an increase in imports (not from the CIS countries) into the region leads to a loss of jobs, including for young people; (ix) on the contrary, exports (not in the CIS countries) helps to increase jobs for youth.

As we have noted, the youth unemployment rate exceeded - during all years - the total unemployment rate (and a significant correlation exist between the dynamic of the two variables over time and between regions). In the next estimated models (Table 5) we try to determine the factor affecting the regional differences (and the dynamic over time) of that ratio. We adopt the same explanatory variable as in the first set of models.

Table 5. Determinants of youth unemployment in comparison with total unemployment (the results of the estimation of the models with the dependent variable "ratio")

Model	R1a	R1b	R2a	R2b	R3a	R3b	R4a	R4b	R5a	R5b
Time lag	-0.07**	-0.05*	-0.09***	-0.10***	-0.08**	-0.07**	-0.09***	-0.07**	-0.07**	-0.05*
Auto Spatial lag	-0.23***		-0.25***		-0.21***		-0.22***		-0.22***	
Boundary Spatial lag		0.01***		0.02***		0.01***		0.01***		0.01***
d2002	-0.58***	-0.02	-0.64***	-0.03	-0.54***	-0.01	-0.55***	-0.02	-0.56***	0.01***
d2003	-0.24***	0.02	-0.28***	-0.01	-0.22***	0.01	-0.22***	0.00	-0.23***	-0.01
d2004	-0.81***	-0.14***	-0.89***	-0.15***	-0.77***	-0.13***	-0.77***	-0.16	-0.80***	0.00***
d2005	-0.62***	0.02	-0.70***	0.00	-0.56***	0.04	-0.55***	0.00	-0.60***	-0.16
d2006	-0.55***	0.09*	-0.64***	0.06*	-0.49***	0.11***	-0.48***	0.07	-0.53***	0.02***
d2007	-0.86***	0.14**	-0.99***	0.11**	-0.80***	0.15***	-0.78***	0.08	-0.85***	0.08***
d2008	-0.73***	0.12**	-0.88***	0.07	-0.69***	0.13***	-0.65***	0.03	-0.75***	0.11**
d2009	0.02	0.15***	-0.09*	0.08*	0.02	0.16***	0.10	0.02	-0.04	0.07***
shurban	-0.02**	-0.03***								
shareyouth	-0.03**	-0.02								
students	0.00**	0.00								
numberpension	0.00**	0.00*								
regcrim	0.00	0.00								
migrate			0.00**	0.00***						
miginotherreg			0.00	0.00						
miginabroad			0.00	0.00						
migoutotherreg			0.00	0.00						
migoutabroad			-0.01	0.00						
gdppercappp					0.00	0.00				
pensionpp							0.00	0.00		
expcis									0.64	0.28
impcis									0.45	0.37
expoth									-0.20***	-0.22***
impoth									0.05***	0.06***
AB test AR(2)	-1.18	-1.09	-1.3	-1.37	-1.22	-1.15	-1.18	-1.18	-1.07	-109
AB test AR(3)	1.43	1.41	-1.36	1.37	1.38	1.36	1.35	1.37	1.31	1.25
Sargan test	35.87	37.48	40.15	40.8	34.9	36.8	37.02	37.02	36.67	38.79

Source: our results on ROSSTAT data

Note: *** - significant at 1%, ** - significant at 5%, * - significant at 10%

As for this second set of models, the main results can be summarized and interpreted as follow: (i) as in the previous case we have received confirmation of the existence of spatial correlation for the ratio of youth and total unemployment rate in Russia; (ii) the time lag is negative and significant in all models, so the situation with youth unemployment (compared with the total one) is improving; (iii) conclusion about the temporary dynamics of youth

unemployment compared to the total, the impact of the crisis in 2008-2009, made for the previous model, also hold; (iv) the higher the level of urban population in the region, the easier the young people to find a job and the less the ratio of youth and total unemployment; (v) conclusion on the impact of migration and pensioners is the same as in the previous case; (vi) conclusions regarding the degree of openness of the region in terms of exports and imports are similar to the previous estimates.

5. Final Remarks

The investigation of the differences and dynamics in regional youth unemployment rate (and its ratio with respect to total unemployment rate) is extremely important in terms of policy implications but it is also extremely difficult due to the large number of explanatory variables potentially relevant.

As for 75 Russian regions over the period 2000-2009 we presented descriptive statistics and we obtained significant econometric results confirming the above argumentations. In particular, youth unemployment rates are persistently higher than total (or adult) unemployment rates and a clearcut spatial dependence (negative for distance and positive for bordering regions) emerged. The first point confirm the importance of the topic (also in "good times" and not only during and after a crisis) and also suggest that if potential labour market weaknesses are left free to unfold, the price to be paid will be high for a long period of time; the other side of the coin is that policy efforts aimed at increasing labour market performance, if successful, may be able to produce durable outcomes, and this time pattern of benefits should be carefully considered when assessing the present costs of policy interventions. The second point (spatial autocorrelation), indicates that supra-regional aspects do matter in shaping labour market performance and that policy design should carefully consider the true spatial extent and interactions which take place at regional level. Between the many significant explanatory variables discussed in the previous section, it should be especially noted that (i) a higher level of regional economic development is able to improve the relative situation in terms of youth unemployment (and its ratio with total unemployment rate); (ii) demographic, migration and family conditions can be important factor affecting both regional youth unemployment rate and its ratio with total unemployment rate; (iii) regional openness and export/import can significantly affect youth unemployment (and its ratio with total unemployment rate).

A quite general but important policy implication is that it does not exists a simple and single policy intervention able to significantly improve the youth labour market performance

(in absolute and relative terms), but it is necessary a complex and large set of macro and micro economic, institutional and labour policies able to favour a sustainable economic and social development.

References

Abowd, J., Kramarz, F., Lemieux, T., & Margolis, D. (1997). Minimum wages and youth employment in France and the United States. NBER working paper 6111.

Arpaia A. and N. Curci (2010), "EU Labour Market Behaviour During the Great Recession", *European Economy*, Economic Papers 405.

Barbieri, G., & Sestito, P. (2008). Temporary workers in Italy: Who are they and where they end up. *Labour, 22*(1), 127-166.

Basile R. and L. De Benedictis (2008), "Regional unemployment and productivity in Europe", *Papers in Regional Science*, v. 87, n. 2.

Bassanini, A., & Duval, R. (2006). Employment patterns in OECD countries: Reassessing the role of policies and institutions. OECD Economics Department working paper 486.

Belke A. (2007), "Endogenous Optimum Currency Areas and the Blend of Sectors – On the Determinants of Business Cycle Correlation across European Regions", *Journal of Economic Integration*, 22(1), 26-49.

Belke A. and J. M. Heine (2006), "Specialisation patterns and the synchronicity of regional employment cycles in Europe", *IEEP* (Springer-Verlag), 3:91–104.

Bell, D. N. F., & Blanchflower, D. G. (2009). What should be done about rising unemployment in the UK. IZA discussion paper, No. 4040, Bonn.

Blanchard O.J. and L.F. Katz (1992), "Regional evolutions", *Brooking Papers on Economic Activities* 1: 1–75.

Booth, A. L., Francesconi, M., & Frank, J. (2002). Temporary jobs: Stepping stones or dead ends? *Economic Journal, 112*(480), F189-F213.

Bornhorst, F., & Commander, S. (2006). Regional unemployment and its persistence in transition countries. *The Economics of Transition, 14*(2), 269-288.

Brunello, G., & Checchi, D. (2005). School quality and family background in Italy. *Economics of Education Review, 24*(5), 563-77.

Brunello, G., Garibaldi, P., & Wasmer. (2007). *Education and training in Europe.* Oxford University Press, New York.

Caroleo, F. E., & Pastore, F. (2003). Youth participation in the labour market in Germany, Spain and Sweden. In T. Hammer (Eds.), Youth Unemployment and social Exclusion in Europe, Policy Press, Bristol.

Caroleo, F. E., & Pastore, F. (2007). *The youth experience gap: Explaining differences across EU countries.* Università di Perugia, Quaderni del Dipartimento di Economia, Finanza e Statistica 41.

Carmeci, L., & Mauro, L. (2003). Long run growth and investment in education: Does unemployment matter? *Journal of Macroeconomics, 25,* 123-137.

Checchi, D. (2003). The Italian educational system: Family background and social stratification. Department of Economics, University of Milan, working paper, 2003-01.

Checchi, D. (2006). *The economics of education.* Cambridge: Cambridge University Press.

M. Choudhry, E. Marelli and M. Signorelli (2011), "Youth Unemployment and the Impact of Financial Crises", *International Journal of Manpower*, forthcoming.

Clark, K. B., & Summers, L. H. (1982). The dynamics of youth unemployment. In R. B. Freeman, & D. A. Wise (Eds.), *The youth labour market problem: its Nature, causes and consequences.* Chicago Press/NBER.

Cockx, B., & Picchio, M. (2009). Are short-lived jobs stepping stones to long-lasting jobs? IZA discussion paper, No. 4004, Bonn.

Demidova O., Signorelli M. (2011), "The Impact of Crises on Youth Unemployment of Russian Regions: An Empirical Analysis", *China-USA Business Review*, v.10, № 7

Elhorst, J. P. (2003). The mystery of regional unemployment differentials: Theoretical and empirical explanations. *Journal of Economic Surveys, 17*(5), 709-748.

Fatás A. (1997), "Countries or Regions? Lessons from the EMS Experience", *European Economic Review* 41, 743-751.

Feige, E.L. (1997), "Underground activity and institutional change: productive, protective and predatory behaviour in transition economies", in Nelson, J. M., Tilly, C., Walker, L. (Eds), *Transforming Post-Communist Political Economies*, National Academy Press, Washington, D.C, pp.21-33.

Flaim, P. (1990). Population changes, the baby boom and the unemployment rate. *Monthly Labor* Review, 113, 3-10.

Gimpelson V.E., R. I. Kapelyushnikov, A.Lukyanova (2010), "Employment Protection Legislation in Russia: Regional Enforcement and Labor Market Outcomes", Comparative Economic Studies, V. 52. № 4. С. 611—636

Gimpelson V.E, R.I. Kapeliushnikov (2011), "Labor Market Adjustment: Is Russia Different?" Institute for the Study of Labor. IZA DP No. 5588.

Gacs, V., & Huber, P. (2005). Quantity adjustment in the regional labour markets of EU candidate countries. *Paper in Regional Science, 4*(84), 542-558.

Galbraith J.K. and J.E. Garcilazo (2010), "Inequalities, employment and income convergence in Europe: evidence from regional data", *International Review of Applied Economics*, v. 24, n. 3, 359–77.

Garcilazo J.E. and V. Spiezia (2007), "Regional Unemployment Clusters: Neighborhood and State Effects in Europe and North America", *The Review of Regional Studies*, v. 37, n. 3, pp. 282–302.

Green, A. E., Owen, D., & Wilson, R. (2001). Regional differences in labour market participation of young people in the European Union. *European Urban and Regional Studies, 8*(4), 297-318.

Heckman, J. J., & Borjas, G. J. (1980). Does unemployment cause future unemployment? Definitions, questions and answers from a continuous time model of heterogeneity and state dependence. *Economica, 47*(187), 247-283.

Huber, P. (2007). Regional labour market developments in transition: A survey of the empirical literature. *The European Journal of Comparative Economics 4*(2), 263-298.

Ichino, A., Mealli, F., & Nannicini, T. (2005). Temporary work agencies in Italy: A springboard toward permanent employment? *Giornale degli Economisti e Annali di Economia, 64*(1), 1-27.

ILO (1997), *World Labour Report: Industrial Relations, Democracy, and Social Stability, 1997-98*. International Labour Organization, Washington DC.

ILO (2002). A future without child labour. Report 1 (B), ILC 90th session, ILO, Geneva.

ILO (2010a).Global employment trends. International Labour Organization, Geneva, January.

ILO (2010b). Global employment trends for youth. Special issue on the impact of global economic crisis on youth, International Labour Organization, Geneva, August.

Izraeli O. and K.J. Murphy (2003). "The Effect of Industrial Diversity on State Unemployment Rate and Per Capita Income", *The Annals of Regional Science*, 37: 1–14.

Jurajda S. and K. Terrell (2009), "Regional unemployment and human capital in transition economies", *Economics of Transition*, 17(2), 241–74.

Kapelyushnikov R., Kuznetsov A. and Kuznetsova O. (2011), "Market Institutions and the Russian Labour Market Performance", Paper proposed for International Workshop, 10-11 November, Perugia.

Kapelyushnikov R. (2011b) How to measure EPL stringency for Russia: a comment : Working paper WP3/2011/02 [Text] / R. I. Kapelyushnikov ; Higher School of Economics. — Moscow: Publishing House of the Higher School of Economics, 2011. — 20 p. — 150 copies. (In Russian)

Kolev, A., & Saget, C. (2005). Understanding youth labour market disadvantage: Evidence from south-east Europe. *International Labour Review, 144*(2), 161-187.

Korenman, S., & Neumark, D. (1997). Cohort crowding and youth labor markets: a cross-national analysis. NBER Work paper No.6031.

Layard, R. and Richter, A. (1995), "Labour market adjustment – the Russian way", in Aslund, A. (Ed.), *Russian Economic Reform at Risk*, Pinter, London.

Lefresne F. (2003). *Les jeunes et l'emploi.* Paris: Collect Repères La Découverte.

Longhi S., P. Nijkamp and I. Traistaru (2005), "Is Sectoral Diversification a Solution to Unemployment? Evidence from EU Regions", *Kyklos*, v. 58, n. 4, 591–610.

Marelli E. (2006), "Regional employment dynamics in the EU: structural outlook, co-movements, clusters and common shocks", in: F.E. Caroleo e S. De Stefanis (eds.), *The European Labour Market. Regional Dimensions*, Physica-Verlag, pp. 89-121.

Marelli E., Patuelli R. and Signorelli m. (2011) "Regional Unemployment in the EU before and after the Global Crisis", paper to be presented at EACES-AISRe Conference, Turin, September 15-17.

Marelli E. and M. Signorelli (2010a), "Institutional, nominal and real convergence in Europe", *Banks and Bank Systems*, v. 5, n. 2 (cont.), 41-57.

Marelli E. and M. Signorelli (2010b), "Transition, Regional Features, Growth and Labour Market Dynamics", in F.E. Caroleo and F. Pastore (eds.), *The Labour Market Impact of the EU Enlargement*, Physica-Verlag, Berlin Heidelberg, pp. 99-147.

Neumark, D., & Wascher, W. (1999). A cross national analysis of the effects of minimum wages on youth employment. NBER Working paper No.7299.

Neumark, D., & Wascher, W. (2004). Minimum wages, labour market institutions, and youth employment: A cross-national analysis. *Industrial and Labour Relations Review, 57*(2), 223-247.

O'Higgins, N. (1997). The Challenge of Youth Unemployment. *Employment and Training Paper 7 ILO,* Geneva.

O'Higgins, N. (2005). Trends in the youth labour market in developing and transition countries. Labor and Demography Working paper No.0507002.

O'Higgins, N. (2011a). "Italy and the global financial and economic crisis," forthcoming in Vaughan-Whitehead, D. (ed.) *Inequality in the World of Work: The Effects of the Crisis* (Cheltenham, Edward Elgar).

O'Higgins N. (2011b), "The Impact of the Economic and Financial Crisis and the Policy Response on Youth Employment in the European Union", Paper proposed for International Workshop Perugia, November 10-11.

Overman H. and D. Puga (2002) "Unemployment Clusters across European Regions and Countries," *Economic Policy,* 34, 117-47.

Perugini, C., & Signorelli, M. (2004). Employment performance and convergence in the European countries and regions. *The European Journal of Comparative Economics, 2*.

Perugini, C., & Signorelli, M. (2007). Labour market performance differentials and dynamics in EU-15 countries and regions. *The European Journal of Comparative Economics 4*(2), 209-262.

Perugini, C., & Signorelli, M. (2010a). Youth labour market performance in European regions. *Economic Change and Restructuring, 2*.

Perugini, C., & Signorelli, M. (2010b). Youth unemployment in transition countries and regions. In *Economic Growth and Structural Features of Transition*. London and New York: Palgrave-Macmillan.

Picchio, M. (2008). Temporary contracts and transitions to stable jobs in Italy. *Labour, 22*(s1), 147-174.

Quintini, G., & Manfredi, T. (2009). Going separate ways? School-to-work transitions in the United States and Europe. OECD Social, Employment and Migration Working paper, No.90, Paris.

Quintini, G., Martin, J. P., & Martin, S. (2007). The changing nature of the school-to-work transition process in OECD countries. IZA discussion paper No.2582.

Quintini, G., & Martin, S. (2006). Starting well or losing their way? The position of youth in the labour market in OECD countries. OECD Social Employment and Migration Working papers No.39.

Rodrìguez-Pose, A. (2003). Human capital and regional disparities in the EU. *Joint Conference of the EC and the EIB on Human Capital, Employment, Productivity and Growth.*

Ryan, P. (2001). The school-to-work transition: A cross-national perspective. *Journal of Economic Literature, 39*(1), 34-92.

Scarpetta, S., Sonnet, A., & Manfredi, T. (2010). Rising youth unemployment during the crisis: How to prevent negative long-term consequences on a generation? OECD Social, Employment and Migration Working papers, No.6, Paris, April.

Sciulli D. and Signorelli M. (2011), "University-to-Work Transitions: An Empirical Analysis on Perugia Graduates", *European Journal of Higher Education*, 1.

Shimer, R. (1999). The impact of young workers on the aggregate labour market. NBER Working paper 7306.

Tyrowicz J. and P. Wòjcik (2010), "Unemployment convergence in transition", in E. Marelli and M. Signorelli (eds.), *Economic Growth and Structural Features of Transition*, Palgrave-Mac Millan.

Vamvakidis A. (2009) "Regional Wage Differentiation and Wage Bargaining Systems in the European Union", *Financial Theory and Practice,* 33 (1) 73-87.

Verick, S. (2009). Who is hit hardest during a financial crisis? The vulnerability of young men and women to unemployment in an economic downturn. IZA Discussion papers, No. 4359, August.

Vishnevskaya, N., and Kapelyushnikov, R. (2007), "Infrorsment trudovogo zakonodastel'stva v Rossii", Working paper No.3, Working paper series "Problems of Labour Market", Moscow State University-Higher School of Economics, Moscow.

Appendix

Table A1. List of variables

Acronym	Definition	Values	Remarks
number	Number of a region		
name a)	Name of a region	1-75	Because of the lack or unreliable data for Chechen Republic, Nenets Autonomous District, Chukotka Autonomous Area, Trans-Baikal Region, Ingushetia Republic, Dagestan Republic, the data for these regions were removed
totun	Total Unemployment	Percent	
numunem (NU)	Number of unemployed	Thousands	
shunemp (SU)	Share of unemployed in the age group 20-29	Percent	
numemp (NE)	Number of Employed	Thousands	
shemp (SE)	Share of Employed in the age group 20-29	Percent	
youthunem (YU)	Unemployment in the age group 20-29	Percent	YU=NU*SU*100/ (NU*SU+NE*SE)
ratio	Ratio of youth and total unemployment		Ratio = youthunem/ totun
shurban	Share of urban population in the total population (as of January 1)	Percent	
shareyouth	Share of population aged 20-29 (in total population age 15-72)	Percent	
students	Number of students in public higher education institutions	Per 10000 population	
numberpens	Number of pensioners in the region	Per 1000 population	
regcrime	The number of registered crimes	Per 100,000 population	
migrate	Migration rates	Number of migrants per 10000 population	
miginotherreg	Migrants who have arrived from another region of Russia	In percentage of total number of migrants arrived to the region	

miginabroad	Migrants who came from outside Russia	In percentage of total number of migrants arrived to the region	
migoutotherreg	Migrants who left for other regions of Russia	As a percentage of the total number of migrants who have left the region	
migoutabroad	Migrants who left for outside of Russia	As a percentage of the total number of migrants who have left the region	
gdp	Gross regional product in the previous year per	Million rubles	The data were available only till 2008
gdppercap	Gross regional product in the previous year per capita	Rubles	The data were available only till 2008
purpower	The cost of a fixed basket of consumer goods and services in 2001-2009, The cost of a fixed basket of consumer goods in 2000	Percent	100 percent – Russia in average
gdppercappp	Gross regional product in the previous year per capita corrected for the different "purchasing power"	Rubles	The data were available only till 2008 Gdppercappp = gdppercap/purpower *100
pension	Average monthly pensions	Rubles	
pensionpp	Average monthly pensions corrected for the different "purchasing power"	Rubles	Pensionpp = pension/ purpower *100
impcis	Import to CIS	Million US dollars	
expcis	Export to CIS	Million US dollars	
expother	Export to other countries	Million US dollars	
impother	Import to CIS	Million US dollars	
openexpcis	Openness of regional economy for export to CIS in the previous year		expcis*US/Rubles exchange rate/gdp
openexpother	Openness of regional economy for export to other countries in the previous year		expother*US/Rubles exchange rate/gdp
openimpcis	Openness of regional economy for import to CIS in the previous year		impcis*US/Rubles exchange rate/gdp
openimpother	Openness of regional economy for import to other countries in the previous year		impother*US/Rubles exchange rate/gdp