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# YOUTH UNEMPLOYMENT IN ITALY AND RUSSIA: AGGREGATE TRENDS AND THE ROLE OF INDIVIDUAL DETERMINANTS

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# YOUTH UNEMPLOYMENT IN ITALY AND RUSSIA:

# AGGREGATE TRENDS AND THE ROLE OF INDIVIDUAL DETERMINANTS[3]

Youth unemployment is a serious problem in many European countries. In the first part of the paper, we consider the aggregate trends in some EU countries and in Russia; we especially investigate the recent period after the global crisis and the Great Recession. We then consider the different types of determinants, including macroeconomic conditions, structural determinants, labour market institutions and regulations. However, the focus of our analysis is on the role played by individual and family determinants such as age, gender, education level, marital status, health, household income, housing conditions.

The econometric part of the paper makes use of Eurostat micro-level data EU-SILC for Italy and RLMS-HSE data set for Russia. We use a Heckman probit model to estimate the unemployment risk of young people during the period 2004-2011. Our main research question is to explain the probability of being unemployed for young people in terms of their personal characteristics and compare these outcomes with results for the same model for adults. We take also into account some macro variables, such as living in urban areas or the regional unemployment rate. The results are of interest, since the two countries have quite different labour market institutions, besides having different levels of youth unemployment. However, most of the explanatory variables act in the same direction in both countries and it is interesting to compare the relative size of such effects, which we measure through the average partial effects.

Keywords: youth unemployment, individual determinants of unemployment, regional unemployment, Heckman probit.

JEL classification: J64

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## 1. Introduction

The youth unemployment rate (YUR)[4] is, in most countries, at least twice as high as the total unemployment rate (TUR). In many countries it has increased significantly in the last five years, after the global crisis. Long-term unemployment is especially pernicious, since it causes a loss of work experience and human capital, or in the case of young people a loss of the abilities acquired at school; it leads to lower employability and reduced earnings over the entire life cycle, raising the risk of a "lost generation" (e.g., Scarpetta et al. 2010).

The causes of youth unemployment are several: macroeconomic conditions, structural determinants, institutional features (concerning both the labour market rules and the school system). In this paper we review some of them focusing on personal and family characteristics.

Although in the descriptive section we analyse recent trends of youth unemployment in many countries, with particular reference to the recent period after the crisis, our econometric investigations focus on two countries: Italy and Russia. These countries are different in many ways—structural and institutional conditions, macroeconomic trends—but precisely for this reason it is interesting to assess whether the personal and family determinants behave in a similar manner.

This paper explains the probability of being unemployed for young people in terms of their personal or family characteristics and compares these outcomes with results for the same model for adults. The empirical analysis refers to the period 2004-2011 for both countries. We use Eurostat micro-level data EU-SILC for Italy and RLMS-HSE data set for Russia.

The econometric strategy is based on the Heckman probit model to estimate the unemployment risk of young people. This model is appropriate since it takes into account the possibility of the non-random selection of labour participation. In addition to individual characteristics, we consider also some macro variables, such as living in urban areas or the regional unemployment rate. We also provide more detailed estimations, for instance, by gender. The comparisons between the two countries are mainly achieved by computing the average partial effects (APE).

The structure of the paper is the following. Section 2 illustrates the trends for youth and TUR in Italy, Russia and other countries. Section 3 reviews the main determinants of youth unemployment, both at the macro and at the individual level. Section 4 describes the data sets used in the empirical investigations and gives descriptive statistics of the samples. Section 5 discusses the econometric investigations of the determinants of the total and YURs, for the two countries. Section 6 concludes.

## 2. Recent trends in Youth Unemployment

Let us consider, first of all, the trends in TUR. Even before the crisis there were large variations across countries. In 2007 (see Table 1), TUR was 3.9% in Japan, 4.6% in the USA and 7.2% in the EU. Within the EU it ranged from 3.6% (the Netherlands) to 11.2% (Slovakia).

[4] Generally referring to individuals aged 15-24 years (more detailed definitions provided in the next Section).

**Table 1 - Unemployment rate (all ages): EU countries and comparisons**

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2013/2007 ratio* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| European Union (28) | 9,3 | 9,1 | 8,3 | 7,2 | 7,1 | 9 | 9,7 | 9,7 | 10,5 | 10,9 | *1,5* |
| Euro area | 9,2 | 9,1 | 8,4 | 7,6 | 7,6 | 9,6 | 10,1 | 10,1 | 11,4 | 12,1 | *1,6* |
| Belgium | 8,4 | 8,5 | 8,3 | 7,5 | 7 | 7,9 | 8,3 | 7,2 | 7,6 | 8,4 | *1,1* |
| Bulgaria | 12,1 | 10,1 | 9 | 6,9 | 5,6 | 6,8 | 10,3 | 11,3 | 12,3 | 12,9 | *1,9* |
| Czech Republic | 8,3 | 7,9 | 7,1 | 5,3 | 4,4 | 6,7 | 7,3 | 6,7 | 7 | 7 | *1,3* |
| Denmark | 5,5 | 4,8 | 3,9 | 3,8 | 3,5 | 6 | 7,5 | 7,6 | 7,5 | 7 | *1,8* |
| Germany | 10,5 | 11,3 | 10,3 | 8,7 | 7,5 | 7,8 | 7,1 | 5,9 | 5,5 | 5,3 | *0,6* |
| Estonia | 9,7 | 7,9 | 5,9 | 4,6 | 5,5 | 13,8 | 16,9 | 12,5 | 10,2 | : | *2,2* |
| Ireland | 4,5 | 4,4 | 4,5 | 4,7 | 6,4 | 12 | 13,9 | 14,7 | 14,7 | 13,1 | *2,8* |
| Greece | 10,5 | 9,9 | 8,9 | 8,3 | 7,7 | 9,5 | 12,6 | 17,7 | 24,3 | 27,3 | *3,3* |
| Spain | 10,9 | 9,2 | 8,5 | 8,3 | 11,3 | 18 | 20,1 | 21,7 | 25 | 26,4 | *3,2* |
| France | 9,3 | 9,3 | 9,2 | 8,4 | 7,8 | 9,5 | 9,7 | 9,6 | 10,2 | 10,8 | *1,3* |
| Croatia | 13,8 | 12,8 | 11,4 | 9,6 | 8,4 | 9,1 | 11,8 | 13,5 | 15,9 | 17,6 | *1,8* |
| **Italy** | **8** | **7,7** | **6,8** | **6,1** | **6,7** | **7,8** | **8,4** | **8,4** | **10,7** | **12,2** | *2,0* |
| Cyprus | 4,6 | 5,3 | 4,6 | 3,9 | 3,7 | 5,4 | 6,3 | 7,9 | 11,9 | 16 | *4,1* |
| Latvia | 11,7 | 10 | 7 | 6,1 | 7,7 | 17,5 | 19,5 | 16,2 | 15 | 11,9 | *2,0* |
| Lithuania | 11,6 | 8,5 | 5,8 | 4,3 | 5,8 | 13,8 | 17,8 | 15,4 | 13,4 | 11,8 | *2,7* |
| Luxembourg | 5 | 4,6 | 4,6 | 4,2 | 4,9 | 5,1 | 4,6 | 4,8 | 5,1 | 5,9 | *1,4* |
| Hungary | 6,1 | 7,2 | 7,5 | 7,4 | 7,8 | 10 | 11,2 | 10,9 | 10,9 | 10,2 | *1,4* |
| Malta | 7,2 | 6,9 | 6,9 | 6,5 | 6 | 6,9 | 6,9 | 6,5 | 6,4 | 6,5 | *1,0* |
| Netherlands | 5,1 | 5,3 | 4,4 | 3,6 | 3,1 | 3,7 | 4,5 | 4,4 | 5,3 | 6,7 | *1,9* |
| Austria | 4,9 | 5,2 | 4,8 | 4,4 | 3,8 | 4,8 | 4,4 | 4,2 | 4,3 | : | *1,0* |
| Poland | 19,1 | 17,9 | 13,9 | 9,6 | 7,1 | 8,1 | 9,7 | 9,7 | 10,1 | 10,3 | *1,1* |
| Portugal | 7,5 | 8,6 | 8,6 | 8,9 | 8,5 | 10,6 | 12 | 12,9 | 15,9 | 16,5 | *1,9* |
| Romania | 8 | 7,2 | 7,3 | 6,4 | 5,8 | 6,9 | 7,3 | 7,4 | 7 | 7,3 | *1,1* |
| Slovenia | 6,3 | 6,5 | 6 | 4,9 | 4,4 | 5,9 | 7,3 | 8,2 | 8,9 | 10,2 | *2,1* |
| Slovakia | 18,4 | 16,4 | 13,5 | 11,2 | 9,6 | 12,1 | 14,5 | 13,7 | 14 | 14,2 | *1,3* |
| Finland | 8,8 | 8,4 | 7,7 | 6,9 | 6,4 | 8,2 | 8,4 | 7,8 | 7,7 | 8,2 | *1,2* |
| Sweden | 7,4 | 7,7 | 7,1 | 6,1 | 6,2 | 8,3 | 8,6 | 7,8 | 8 | 8 | *1,3* |
| United Kingdom | 4,7 | 4,8 | 5,4 | 5,3 | 5,6 | 7,6 | 7,8 | 8 | 7,9 | : | *1,5* |
| Iceland | 3,1 | 2,6 | 2,9 | 2,3 | 3 | 7,2 | 7,6 | 7,1 | 6 | 5,4 | *2,3* |
| Norway | 4,3 | 4,5 | 3,4 | 2,5 | 2,5 | 3,2 | 3,6 | 3,3 | 3,2 | 3,5 | *1,4* |
| Turkey | : | 9,2 | 8,7 | 8,8 | 9,7 | 12,5 | 10,7 | 8,8 | 8,1 | : | *0,9* |
| United States | 5,5 | 5,1 | 4,6 | 4,6 | 5,8 | 9,3 | 9,6 | 8,9 | 8,1 | 7,4 | *1,6* |
| Japan | 4,7 | 4,4 | 4,1 | 3,9 | 4 | 5,1 | 5,1 | 4,6 | 4,3 | : | *1,1* |
| **Russia** | **7,8** | **7,1** | **7,1** | **6,0** | **6,2** | **8,3** | **7,3** | **6,5** | **5,5** | **5,5** | *0,9* |

*Source: Eurostat and Rosstat (Russia)*

*Note*: 2012/2007 ratio if 2013 not available*

Then, the financial crisis led to an increase in unemployment, but the increase was rapid in the countries with more flexible labour markets and slower in markets where there were rigidities or internal flexibilities (e.g. working hour adjustments). In the EU, unemployment also rose in 2012-13 because of the new recession caused by the sovereign debt crisis. Despite the current feeble recovery in 2014 it is expected to remain at high levels for a long period. On average, after recessions, employment returns to pre-crisis levels after four or five months, but such lags are longer in the case of the financial crises. An exceptional case is provided by Germany, where unemployment decreased

even during the crisis period (from 11.3% in 2005 and 8.7% in 2007 to 5.3% in 2013), because of company flexibility and labour hoarding practices.

The largest unemployment increases from 2007 to 2013 (see the last column of Table 1) were recorded in Cyprus, Greece, Spain, and Ireland, where TUR increased by a factor of 3 to 4; among the large countries it doubled in Italy (from 6.1% to 12.2%). While in the EU as a whole grew by 50%, in the USA it more than doubled from 2007 to 2010, then it fell back to around 7%. A similar profile, although at lower levels, is shown in Russia. Apart from the German reduction, the smallest increases are recorded in Poland, Austria, Belgium, Malta, Romania, Japan, and Turkey.

As to "youth unemployment" definition[5], in most countries it refers to individuals aged 15-24 years. However other ages are sometimes considered; moreover problems such as underemployment and informal sector employment may be particularly relevant for young people in certain areas (this is the case of the South of Italy and certain Russian regions). The YUR in the pre-crisis situation (2007) exhibited wide variations (Table 2): from 7% in the Netherlands to 22.9% in Greece.

In many countries, even before the recent crisis, the YUR was increasing. The general impact of the crisis on YUR was similar to that of TUR: e.g. in the EU it increased by 50% (see next to the last column in Table 2). Nevertheless, even in countries with flexible employment such as the USA, there is a higher persistence compared to TUR. In some other countries, the initial impact of the crisis on YUR has been moderate, but they suffer because of bad long run consequences, such as loss of work experience and human capital, lower employability and reduced earnings over the entire life cycle, poorer job quality and precarious employment.

Furthermore, in a number of countries the impact of the crisis on YUR has been larger, also due to adverse institutional settings; this is the case in Italy. Younger workers, who have weaker work contracts, lower qualifications and less experience than older workers, have borne the brunt of the "Great Recession" (Arpaia and Curci, 2010). The largest increases of the YUR in the 2007-2013 period are recorded in Cyprus (by a factor of 3.8), Spain (3.1), Ireland (2.9), Greece and Lithuania (2.6), Latvia and Slovenia (2.2), Estonia and Croatia (2.2), Bulgaria and Italy (2.0). The YUR actually decreased only in Germany (and to a less extent in Turkey).

If we now focus on the YUR/TUR ratio (the last column of Table 2), we can see that the YUR is double the TUR in most countries; this is the mean situation in the EU, and in non-European countries. The best statistics for young people (compared to the TUR) can be found in Germany, where the YUR in 2013 was less than 8%. On the contrary, the worst situation is recorded in Luxembourg (3.4 ratio and 19.9% YUR in 2013), Italy (3.3, 40%), Romania (3.2, 23.6%), Russia (3.1, 17.3%), Sweden (2.9, 23.4%), Belgium (2.8, 23.7%), Czech Republic (2.7, 18.9%), Poland (2.7, 27.3%), United Kingdom (2.7, 21%). In absolute terms, the highest YUR are those of Greece (58.6%), Spain (55.7%), Croatia (49.9%), Italy (40%). In Ireland, a country also deeply affected by the crisis, it is "only" 26.8%.

[5] In addition to the youth unemployment rate, some other definitions are sometimes used. For example, O'Higgins (2011) and Scarpetta et al. (2010) observe that the size of the group of "youth left behind" can be proxied by the number of young people who are neither employed nor in education or training (NEET). This definition is now considered also by OECD, Eurostat, and other institutions.

**Table 2 - Youth unemployment rate (<25 years): EU countries and comparisons**

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2013/ 2007 ratio* | YUR/TUR ratio (2013)° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU Union (28) | 19,1 | 18,9 | 17,6 | 15,7 | 15,8 | 20,1 | 21,1 | 21,5 | 23 | 23,5 | *1,5* | *2,2* |
| Euro area | 17,9 | 18,1 | 16,9 | 15,4 | 15,9 | 20,2 | 20,9 | 20,8 | 23,1 | 24 | *1,6* | *2,0* |
| Belgium | 21,2 | 21,5 | 20,5 | 18,8 | 18 | 21,9 | 22,4 | 18,7 | 19,8 | 23,7 | *1,3* | *2,8* |
| Bulgaria | 24,3 | 21 | 18,3 | 14,1 | 11,9 | 15,1 | 21,8 | 25 | 28,1 | 28,6 | *2,0* | *2,2* |
| Czech Rep. | 20,4 | 19,3 | 17,5 | 10,7 | 9,9 | 16,6 | 18,3 | 18,1 | 19,5 | 18,9 | *1,8* | *2,7* |
| Denmark | 8,2 | 8,6 | 7,7 | 7,3 | 8,1 | 11,8 | 13,9 | 14,3 | 14 | 13 | *1,8* | *1,9* |
| Germany | 13,8 | 15,6 | 13,8 | 11,9 | 10,6 | 11,2 | 9,9 | 8,6 | 8,1 | 7,9 | *0,7* | *1,5* |
| Estonia | 21,6 | 16,1 | 11,9 | 10,1 | 12,1 | 27,5 | 32,9 | 22,3 | 20,9 | : | *2,1* | *2,0* |
| Ireland | 8,7 | 8,6 | 8,7 | 9,1 | 13,3 | 24 | 27,6 | 29,1 | 30,4 | 26,8 | *2,9* | *2,0* |
| Greece | 26,9 | 26 | 25,2 | 22,9 | 22,1 | 25,8 | 32,9 | 44,4 | 55,3 | 58,6 | *2,6* | *2,1* |
| Spain | 22 | 19,7 | 17,9 | 18,2 | 24,6 | 37,8 | 41,6 | 46,4 | 53,2 | 55,7 | *3,1* | *2,1* |
| France | 20,8 | 21,3 | 22,4 | 19,8 | 19,3 | 24 | 23,7 | 22,9 | 24,7 | 25,5 | *1,3* | *2,4* |
| Croatia | 32,8 | 31,9 | 28,8 | 24 | 21,9 | 25,1 | 32,6 | 36,1 | 43 | 49,9 | *2,1* | *2,8* |
| **Italy** | **23,5** | **24** | **21,6** | **20,3** | **21,3** | **25,4** | **27,8** | **29,1** | **35,3** | **40** | ***2,0*** | ***3,3*** |
| Cyprus | 10,2 | 13,9 | 10 | 10,2 | 9 | 13,8 | 16,6 | 22,4 | 27,8 | 38,7 | *3,8* | *2,4* |
| Latvia | 20 | 15,1 | 13,6 | 10,6 | 13,6 | 33,3 | 36,2 | 31 | 28,5 | 23,2 | *2,2* | *1,9* |
| Lithuania | 23,1 | 16,3 | 10,2 | 8,4 | 13,3 | 29,6 | 35,7 | 32,6 | 26,7 | 21,9 | *2,6* | *1,9* |
| Luxembourg | 16,4 | 14,6 | 15,5 | 15,6 | 17,3 | 16,5 | 15,8 | 16,4 | 18 | 19,9 | *1,3* | *3,4* |
| Hungary | 15,5 | 19,4 | 19,1 | 18,1 | 19,9 | 26,5 | 26,6 | 26,1 | 28,1 | 27,2 | *1,5* | *2,7* |
| Malta | 16,6 | 16,5 | 15,9 | 13,9 | 12,2 | 14,4 | 13,1 | 13,8 | 14,2 | 13,9 | *1,0* | *2,1* |
| Netherlands | 9 | 9,4 | 7,5 | 7 | 6,3 | 7,7 | 8,7 | 7,6 | 9,5 | 11 | *1,6* | *1,6* |
| Austria | 9,7 | 10,3 | 9,1 | 8,7 | 8 | 10 | 8,8 | 8,3 | 8,7 | : | *1,0* | *2,0* |
| Poland | 39,6 | 36,9 | 29,8 | 21,6 | 17,2 | 20,6 | 23,7 | 25,8 | 26,5 | 27,3 | *1,3* | *2,7* |
| Portugal | 18,9 | 19,8 | 20,1 | 20,4 | 20,2 | 24,8 | 27,7 | 30,1 | 37,7 | 37,7 | *1,8* | *2,3* |
| Romania | 21 | 19,7 | 21 | 20,1 | 18,6 | 20,8 | 22,1 | 23,7 | 22,7 | 23,6 | *1,2* | *3,2* |
| Slovenia | 16,1 | 15,9 | 13,9 | 10,1 | 10,4 | 13,6 | 14,7 | 15,7 | 20,6 | 22,7 | *2,2* | *2,2* |
| Slovakia | 33,4 | 30,4 | 27 | 20,6 | 19,3 | 27,6 | 33,9 | 33,7 | 34 | 33,6 | *1,6* | *2,4* |
| Finland | 20,7 | 20,1 | 18,7 | 16,5 | 16,5 | 21,5 | 21,4 | 20,1 | 19 | 19,9 | *1,2* | *2,4* |
| Sweden | 20,4 | 22,6 | 21,5 | 19,2 | 20,2 | 25 | 24,8 | 22,8 | 23,7 | 23,4 | *1,2* | *2,9* |
| United K. | 12,1 | 12,8 | 14 | 14,3 | 15 | 19,1 | 19,6 | 21,1 | 21 | : | *1,5* | *2,7* |
| Iceland | 8,1 | 7,2 | 8,2 | 7,1 | 8,2 | 16 | 16,2 | 14,6 | 13,6 | 10,7 | *1,5* | *2,0* |
| Norway | 11,2 | 11,4 | 8,8 | 7,2 | 7,3 | 9,2 | 9,2 | 8,7 | 8,6 | 9,1 | *1,3* | *2,6* |
| Turkey | : | 17,4 | 16,4 | 17,2 | 18,4 | 22,7 | 19,7 | 16,8 | 15,7 | : | *0,9* | *1,9* |
| United States | 11,8 | 11,3 | 10,5 | 10,5 | 12,8 | 17,6 | 18,4 | 17,3 | 16,2 | 15,5 | *1,5* | *2,1* |
| Japan | 9,5 | 8,7 | 8 | 7,7 | 7,3 | 9,1 | 9,3 | 8,2 | 8,1 | : | *1,1* | *1,9* |
| **Russia** | 20.8 | 18.3 | 19.6 | 16.9 | 16.3 | 22.6 | 20.4 | 17.9 | 17.3 | : | *1,0* | *3,1* |

*Source: Eurostat and Rosstat (Russia)*

*Notes: *: 2012/2007 ratio if 2013 not available; °(2012) for the same countries*

Although we have made, so far, many comparisons across countries, we must emphasize that there is a wide variation also within countries, especially in large ones. For example, in Italy unemployment has traditionally been much higher in Southern regions: in 2007, TUR was equal to 11% in the South compared to 6.1% for the country as a whole; in 2011 (the last available year for regional data) 13.3% and 8.4% respectively. In the case of YUR, the differences are similar, e.g. 39.2% in 2011 in the South of Italy and 29.1% in the whole country. The relative increase between 2007 and 2011 (last column of Table 3) appears smaller in the South: this is because the impact of the economic crises in such regions lagged, although it is more persistent over time.

If we consider some individual regions, the variation is even greater. As an example of "good" regions, we consider Lombardy, which the richest and most populated region in the North, although it is not the best from the point of view of unemployment (the regions in the North-East of the country perform even better). The worst region, from the point of view of unemployment, is Campania, a populous region in the South. In 2011, the TUR was equal in these two regions: 5.8% and 15.5% and the YUR to 20.7% and 44.4%, respectively. Despite these significant regional variations, we maintain that youth unemployment is a worrying problem in all regions of the country.

Also in Russia there are significant regional variations (Table 4), with the TUR as low as 1.5-1.7% in St. Petersburg and Moscow,and 13 per cent in the North Caucasus.

**Table 3 - Unemployment rate: regional differences in Italy**

| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 11/07 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total unemployment** | 9,0 | 8,5 | 8,4 | 8,0 | 7,7 | 6,8 | 6,1 | 6,7 | 7,8 | 8,4 | 8,4 | *1,4* |
| Lombardy | 3,3 | 3,3 | 3,6 | 4,0 | 4,1 | 3,7 | 3,4 | 3,7 | 5,4 | 5,6 | 5,8 | *1,7* |
| Campania | 18,8 | 17,6 | 16,9 | 15,6 | 14,9 | 12,9 | 11,2 | 12,6 | 12,9 | 14,0 | 15,5 | *1,4* |
| South of Italy | 16,0 | 15,0 | 15,0 | 14,0 | 14,0 | 12,0 | 11,0 | 11,0 | 12,0 | 13,0 | 13,3 | *1,2* |
| **Youth unemployment** | 23,1 | 22,0 | 23,6 | 23,5 | 24,0 | 21,6 | 20,3 | 21,3 | 25,4 | 27,8 | 29,1 | *1,4* |
| Lombardy | 9,7 | 10,1 | 11,2 | 12,7 | 13,0 | 12,3 | 12,9 | 12,5 | 18,5 | 19,8 | 20,7 | *1,6* |
| Campania | 45,5 | 44,7 | 39,9 | 37,7 | 38,8 | 35,4 | 32,5 | 32,4 | 38,1 | 41,9 | 44,4 | *1,4* |
| South of Italy | 39,0 | 38,0 | 37,0 | 36,0 | 37,0 | 33,0 | 31,0 | 31,0 | 34,0 | 38,0 | 39,2 | *1,3* |

*Source: Istat*

**Table 4 – Total unemployment rate: regional differences in Russia**

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 13/04 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **The Russian Federation** | 7,8 | 7,1 | 7,1 | 6,0 | 6,2 | 8,3 | 7,3 | 6,5 | 5,5 | 5,5 | *0,7* |
| Central Federal District | 4,7 | 4,3 | 4,0 | 3,1 | 3,6 | 5,8 | 4,6 | 4,1 | 3,1 | 3,3 | *0,7* |
| Northwestern Federal District | 6,0 | 5,4 | 4,9 | 4,1 | 5,0 | 6,9 | 5,9 | 5,1 | 4,0 | 4,3 | *0,7* |
| Southern Federal District | 9,6 | 8,4 | 8,2 | 7,0 | 6,4 | 8,6 | 7,6 | 7,0 | 6,2 | 6,5 | *0,7* |
| The North Caucasus Federal District | 18,8 | 17,1 | 22,6 | 19,2 | 15,7 | 16,0 | 16,5 | 14,5 | 13,1 | 13,0 | *0,7* |
| Volga Federal District | 7,9 | 7,4 | 6,5 | 6,1 | 6,2 | 8,6 | 7,6 | 6,5 | 5,3 | 4,9 | *0,6* |
| Urals Federal District | 7,4 | 6,7 | 6,8 | 4,9 | 5,5 | 8,1 | 8,0 | 6,8 | 6,0 | 5,7 | *0,8* |
| Siberian Federal District | 9,9 | 9,3 | 8,7 | 7,6 | 8,3 | 10,5 | 8,7 | 8,1 | 7,1 | 7,2 | *0,7* |
| Far Eastern Federal District | 8,9 | 7,9 | 7,4 | 6,6 | 7,7 | 9,2 | 8,6 | 7,4 | 6,7 | 6,5 | *0,7* |
| **Moscow** | 1,6 | 0,8 | 1,6 | 0,8 | 0,9 | 2,8 | 1,8 | 1,4 | 0,8 | 1,7 | *1,1* |
| **St. Petersburg** | 2,7 | 2,2 | 2,4 | 2,1 | 2,0 | 4,1 | 2,6 | 2,0 | 1,1 | 1,5 | *0,6* |

*Source: Rosstat*

## 3. Factors explaining Youth Unemployment: a brief survey

Before analysing the youth unemployment problem and the literature on micro determinants of personal and family characteristics, we discuss the issue of unemployment in general. At the macro level we can identify three groups of variables[6]: cyclical conditions, structural variables, and the institutional framework.

[6] Part of this discussion is better explained in Choudhry et al. (2013), where it is shown in the empirical section that YUR are particularly sensitive not only to economic growth, but also to variables such as economic freedom, labour market reforms, share of part time employment, and active labour market policies.

The business cycle, measured for instance by the growth of output or GDP, is a key explanatory variable of labour demand, hence of employment and unemployment dynamics. The link between GDP growth and unemployment change is normally expressed through the Okun's law; changes in Okun's coefficients across countries and over time are generally explained by differences in institutions and policies (IMF, 2010). The highest impact of the crisis can be delayed up to three years and the persistence of effects is sometimes detected for up to five years.[7] The impact of GDP on unemployment can be amplified by systemic uncertainty, for instance after the events of the financial crises (Bartolucci et al. 2011). Some other macroeconomic variables that are significant in explaining unemployment dynamics include productivity growth, trade openness, the terms of trade dynamics, the inflation rate and real (long-term) interest rates.

Structural variables include the trade specialisation of countries, the links between the financial structure and real economic activities, the degree of competitiveness. In broader terms, structural variables also include demographic variables such as population density, the age structure of population, and migration flows.

A third group of variables comprises the institutional determinants, whose importance has been long recognized (Nickell and Layard, 1999). They include regulation and policies concerning product markets (liberalisations, reforms, "economic freedom", etc.), housing markets (incidence of home ownership and housing policies), and more specifically labour markets. Some specific variables are the degree of unionisation (union density and union coverage), the structure of collective bargaining (degree of coordination and/or centralisation), employment protection legislation (EPL), incidence of temporary (or part-time) contracts, labour taxes, unemployment benefits and active labour market policies.[8] Notice that reforms in labour and product markets are mutually reinforcing, justifying comprehensive reform programmes; moreover, improvements in labour market performance require reforms in more than one area of the labour market (Bassanini and Duval, 2009).

According to OECD (2006), two-thirds of non-cyclical unemployment changes are explained by changes in policies and institutions. The traditional OECD view (since the *Jobs Studies* of the 1990s) is that the weak employment performance in many European countries can be explained in terms of labour market rigidities and inappropriate policies or institutions. A progressive shift of resources, from passive income support to active measures, was therefore advocated.

If we now analyse the specific issue of youth unemployment, first of all it should be observed that YUR are more sensitive to the business cycle than adult unemployment rates. According to many studies, there is a disproportionately large response in youth employment or unemployment to changes in overall unemployment (Blanchflower and Freeman, 2000). Also following the recent crisis and the Great Recession, the young have suffered disproportionately: see e.g. Bell and Blanchflower (2011)[9] and Bruno et al. (2014). In particular, the rate of transition of youth from unemployment to employment fell dramatically, which is well documented in the case of Ireland, by Kelly et al., 2013.

However, the worse youth labour market performance, compared to adults, can be explained by more specific elements. First, a lower level of human capital. This explains the wide differences existing within the young group, OECD (2005) found that young people with low human capital and few skills are more exposed not only to higher YUR, but also to long-term unemployment, unstable and low quality jobs, and perhaps social exclusion. Although young people generally have higher

[7] With reference to previous financial crises, Choudhry et al. (2012), considering approximately 70 countries in the world, found that the crises' impact on YUR is significant and robust; youth unemployment increases until five years after a financial crisis, with the largest effects in the second and third years.

[8] The key roles of active labour market policies (ALMP) and unemployment benefits in the explanations of changes in both employment and the unemployment rate are confirmed by the empirical analysis of Destefanis and Mastromatteo (2010).

[9] In this study, the sensitivity of YUR to adult rates, for the Oecd countries in the 1970-2009 period, is estimated equal to 1.8.

education than older workers, often they lack other components of human capital, like generic and job-specific work experience.[10] In fact, the youth experience gap harms the employability of young people; an "experience trap" happens when employers select workers with experience, hence labour-market entrants are never hired and so cannot increase their experience.

From this point of view, some other determinants become important. First of all, the quality of the educational system and its structure: it seems that "dual apprenticeship systems", like the German one, guarantee better outcomes. Secondly, the school-to-work transition system (STWT)[11] is relevant, particularly to facilitate "good matches"; in fact, a possible cause of high youth unemployment and low quality employment is the mismatch between the knowledge acquired through formal education and the skills required by the labour market (young workers are generally less efficient in job search activities than adults)[12]. Thirdly, labour market institutions are also important for young workers: for example, the impact of unemployment benefits, labour taxes, minimum wages, employment protection legislation.

A crucial variable is the diffusion of temporary contracts: not only during recessions are young workers generally among the first to lose their jobs (especially in countries with the highest EPL on "permanent contracts"), but labour hoarding practices can further reduce the labour demand for young people.[13] Thus, because of a reduction in labour demand, school-leavers compete with more jobseekers for fewer vacancies and youth unemployment increases and becomes persistent over time: this is the risk of a "lost generation" (Scarpetta et al., 2010). Moreover, not only are the young more often unemployed (or in the NEET group), but even when employed they are frequently underemployed, in the sense of more likely working part-time (even though they would prefer full-time), or under temporary contracts rather than permanent ones (Bell and Blanchflower, 2011). In many cases, an increase in youth unemployment is also accompanied by a decline in labour participation (due to the "discouraged worker effect") or intensified emigration flows.[14]

Recent policies have been undertaken at the EU level in support of youth employment. The new "Youth opportunity initiative" (European Commission, 2010) is designed to prevent early school leaving, help young people in developing skills relevant to the labour market, assisting them in finding a good first job and ensuring on-the-job training. In particular, the "Youth Guarantee Recommendation" (agreed by the EU Council of Ministers in 2013) requires Member States to put in place measures to ensure that young people up to age 25 receive a good quality offer of employment, continuing education, an apprenticeship or a traineeship within four months of leaving school or becoming unemployed (Eurofound, 2012).

Before considering the individual and family determinants of youth unemployment, we recall that there are few investigations of unemployment and youth unemployment at a regional level. Marelli et al. (2012) show that regional unemployment differentials are wide and persistent and low unemployment regions tend to cluster close to each other; in addition, such differentials show a clear core-periphery pattern. With specific reference to YUR, we mention Demidova et al. (2013) concerning the Russian regions and Demidova et al. (2014) regarding both Italian and Russian regions; in both studies, the use of distance matrixes allows an analysis of the role played by spatial

[10] In fact in some countries (Belgium, Italy, and a number of eastern European states) unemployment rates among graduates have sometimes been higher than those with a secondary qualification.

[11] Appropriate "school-to-work" transition services are fundamental to break up the work experience trap, See Caroleo and Pastore (2007), Quintini and Manfredi (2009), Pastore (2012b) and Formez (2012).

[12] An incentive to restrict their job search activity is given by the willingness of parents to support their children, should they not find work.

[13] In many countries, for example in Italy, practically all new employment opportunities in the recent period have been temporary (O'Higgins, 2012).

[14] In some countries like Ireland the age-selective emigration may have reduced, after the crisis, the youth–adult unemployment ratio.

effects. A feature of the Russian labour market is its overall flexibility, both in terms of working time and pay; this flexibility comes from the willingness and ability of both employers and employees to curtail their exposure to formal rules and rely on informal arrangements (Gimpelson et al., 2010).

In Italy, there is a dichotomy of the labour market between the Mezzogiorno regions, i.e. the South and the two islands, where unemployment rates are much higher, activity rates very low, together with the presence of informal activities (or the "black" economy), and the remaining regions of the country (in the North and Central Italy).[15] In Russia, both North-South and East-West divisions have been considered (see the two papers by Demidova et al. mentioned above), although the second type of geographical division is more common. In addition to such divides, other types of polarisation can be detected, for instance contrasting the urbanised centres (especially Moscow) to the rural regions, affected by economic and demographic decline; and the low interregional mobility in Russia (Shilov and Möller, 2009).

Let us now turn to the microeconomic determinants of unemployment, with reference to personal or family characteristics. The econometric investigations making use of micro-data are not numerous, but they are increasing over time. They use either large samples of cross-sectional units or longitudinal data. While a specific application to Italian and Russian data will be made in the next sections, we provide here some examples of empirical investigations making use of micro-data.

Kostoris and Lupi (2002) investigated Italy's unemployment.[16] In addition to the probability of unemployment, they estimated the probability of participation in the labour force and the probability of long-term unemployment. In particular, they found—by means of standard logit models—that youth unemployment strongly depends on family income and wealth; this is particularly true for first-job seekers (but there is no significant relation in case of "strictly unemployed"). Moreover, the probability of unemployment decreases if the families have their own businesses. Education seems to have the opposite effects for the first-job seekers and strictly unemployed: low school degrees increase the risk of unemployment only for the second group. Finally some regional and local variables (average regional per-capita income, local fiscal burden, local public-to-total employment ratio, size of the town of residence, etc.) turn out to be significant.

Caroleo and Pastore (2003) investigated the youth labour market participation decisions in a selection of European countries. The analysis focuses on Spain and Sweden, two countries with rigid and flexible sequential STWT systems respectively, with training following education, and Germany as the best example of a dual educational and training system. They estimated, through multinomial logit estimates, the probability of belonging to one of the five different labour market statuses: unemployed, employed, in training, in education and inactive. Despite significant differences between the three countries, they found little evidence for the positive role of training programmes in increasing the employability of young participants. The subsequent study by Pastore (2012a) focuses on the probability of finding employment in a sample of young adults in Poland, by making use of Heckman probit estimates and controlling for the possible selection bias (in fact employment/joblessness and investment in education are not independent choices). He found that regional characteristics may also be important: in high unemployment areas young people prefer to seek a job rather than study.

[15] A recent paper by De Sanctis (2008) focuses on youth employment and unemployment and compares the situation of Mezzogiorno with that of other European regions. Notice that Southern regions have been especially hurt by the recent crisis. However Pastore (2012c) found that that high unemployment regions have a higher, not a lower rate of reallocation; this is because they especially suffer from high job destruction, rather than from low job creation. Thus economic policies should be targeted at increasing labour demand and raising the competitiveness of such regions.

[16] They used micro-data from Bank of Italy's surveys on households' income.

A joint consideration of personal characteristics and macroeconomic conditions can be found in Hérault et al. (2012), analysing employment outcomes and school-to-work transition of young people in Australia (for the period 1985-2008). They used longitudinal data from two different national surveys and employed a multinomial logit specification. The most important finding is that young men who did not complete secondary school suffered the largest increase in unemployment risks as the unemployment rate increased (on the contrary for females the main impact is an increase in part-time work); overall, the effects of the unemployment rate appear to be more important for youth performance than those of GDP growth.

Bell and Blanchflower (2011) argued that young people aged 16–24 have suffered disproportionately during the recent Great Recession. For the EU-27 countries they used data from the Eurobarometer surveys (February 2008-February 2010) including 88,000 observations. They found that unemployment rates tend to be higher among the less educated young.[17] Finally, Dolado et al. (2013), by using cross-country econometric evidence from different micro-datasets, focused on the labour market characteristics and determinants of youth unemployment in Spain, together with some other key youth labour market dimensions (wages, decisions to work and study, mobility, type of employment contract, time to find a first job, skill mismatches).

The most commonly used personal variables in this type of studies are: gender, age, health conditions, family status (single or married, being head of household, number of children, young adults still living with their parents i.e. cohabitation choice), education level (e.g. primary school, secondary school or tertiary education), nationality (country of origin or immigrant status)[18]. In case of individuals who have previously worked, the most recent industry of employment is in some cases taken into account; perhaps jointly with occupation or profession. In other cases, especially regarding recently graduated students in search of their first job, the school-to-work transition procedures and methods of job search (e.g. employment service, asking a friend.) are analysed.

The most frequently used family variables are family income (disposable income is more often employed) and other family characteristics or socioeconomic background (e.g. parental education and employment status); wealth variables are sometimes considered, although information about the house is more easily obtainable (e.g. number of rooms, area, available services, presence of computers or use of internet). The location of the household is also important, with particular reference to urban or rural locations. More generally, the region of residence plays a key role, provided the previously mentioned regional differentiation in unemployment rates.

## 4. The role of individual determinants: the data sets used and descriptive statistics

For our empirical analysis, concerning the period 2004-2011, we consider two source of data: RLMS-HSE data for Russia and EU-SILC[19] for Italy. We selected observations relating to youth aged 15-24 and, for comparison purposes, adults aged 25-60 for Russia and 25-64 for Italy as these countries have different retirement ages and different definition of "working age". We analysed the 2004-2011 period for both countries. Our main variable of interest is the employment status of the respondents, among the "active people". We use ILO definition to determine unemployed persons.

[17] In this study they focus not only on the determinants, but also on the consequences of youth unemployment, including the long-run effects. Through another investigation on micro data, they show – making use of a continuing longitudinal study that seeks to follow the lives of all those living in Great Britain and various measures of "wellbeing" (life satisfaction, health status, mental health, job satisfaction) – that youth unemployment continues to hurt even two decades later; however, spells of unemployment experienced after age 23 have little bearing on later well-being.

[18] In the case of Germany, the country with the best youth performance (see section 2), Burkert and Siebert (2007) found that "compared to Germans, migrant men and especially migrant women have a higher risk of unemployment and occupational mismatch".

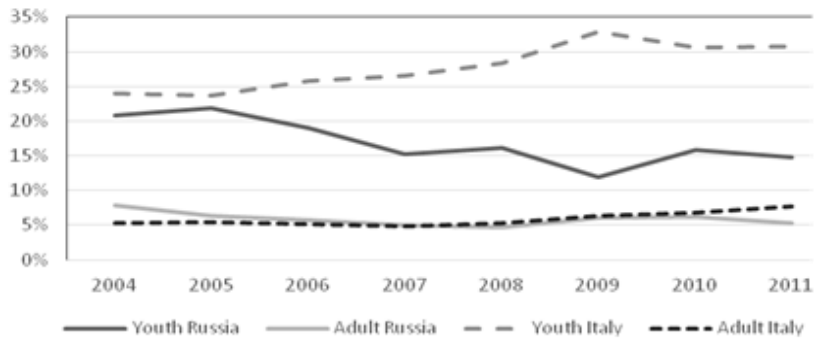
[19] Istat, Indagine sulle condizioni di vita (UDB IT - SILC). This is a survey carried out in the EU countries according to a common methodology. Only the A. (of course not Istat) is responsible for the elaborations in this paper.

Figure 1 shows the dynamics of the unemployment rate which we calculated using sample data for Russia and Italy. Macro level data shows the YUR is much higher for Italy than for Russia. At the end of the period the YUR in Italy is twice that of Russia, 30 and 15% respectively. Adult unemployment rates are similar for both countries and much lower than the YUR.

Table 5 presents descriptive statistics for our samples, separately for Russia and Italy and youth and adults. The unemployment rate for adults is 5% and 6% in Russia and Italy respectively while the YUR is 15% and 27% respectively.

The average age of the youth in the Russian and Italian databases is similar: 21 years. However, for adults the mean age in the sample for Italy is higher (due to the different retirement age). The share of men in the Russian sample is lower than in the Italian sample for both youth and adults. The share of young people with tertiary education is higher in Russia (15%) than in Italy (9%). This fact could be explained by differences in their education systems. In Russia people graduate from University at 22; in Italy it is higher (also because fewer students complete their graduate studies within the standard university period). However, the share of adults with higher education is similar for both countries, while the number of people with secondary education is higher for Italy both for young and adults. There is a huge difference in youth marital status between Russia and Italy; in Russia the incidence of married individuals is much bigger: 30% compared to 4% in Italy. This is due to national and cultural traditions.

*Figure 1. Unemployment rate in Russia and Italy among youth and adult people.*




Note: Authors calculation using RLMS-HSE (Russian database) and EU-SILC (Italian database).

However, there are no significant differences in marital status among adults. Considering further personal characteristics, young people of both countries have good health: only 1-2% of them have bad health. Around 80% of individuals in Russia live in urban areas and 33-36% in Italy. Approximately 70% of Russian youth own a computer; the same figure can be found for Italy. However, only 30% of the Russian adults have a computer while the corresponding figure is 70% for Italy.

There are also some household characteristics in Table 5, such as housing size, the number of household members and family disposable income (computed as a ratio to average family income in the sample). This ratio of disposal incomes is similar for both countries. In Russia the average housing per household member is 10,6 square meters for youth and 12,2 for adults. The number of rooms per household is approximately 3,5 in Italy. Average number of household members is three in Russia. This data is not available for Italy. About 20% of the Russian respondents were not born in Russia. In Italy this figure is less than 7%.

**Table 5. Descriptive statistics in our sample**.

| Variables | Russian Federation | | | | Italy | | | |
|---|---|---|---|---|---|---|---|---|
| | Youth | | Adult | | Youth | | Adult | |
| | Mean | Std.dev. | Mean | Std.dev. | Mean | Std.dev. | Mean | Std.dev. |
| Share of unemployed | 0,15 | 0,36 | 0,05*** | 0,21 | 0,27 | 0,45 | 0,06*** | 0,23 |
| Age | 21,48 | 2,01 | 42*** | 9,87 | 21,63 | 1,95 | 42*** | 9,64 |
| Male (share) | 0,51 | 0,50 | 0,45*** | 0,50 | 0,59 | 0,49 | 0,58** | 0,49 |
| Secondary education (share) | 0,30 | 0,46 | 0,28*** | 0,45 | 0,56 | 0,50 | 0,41*** | 0,49 |
| Tertiary education (share) | 0,15 | 0,36 | 0,27*** | 0,45 | 0,09 | 0,29 | 0,23*** | 0,42 |
| Married (share) | 0,30 | 0,46 | 0,74*** | 0,44 | 0,04 | 0,19 | 0,63*** | 0,48 |
| Urban (share)[20] | 0,79 | 0,41 | 0,77** | 0,42 | 0,33 | 0,47 | 0,36*** | 0,48 |
| Bad health (share) | 0,02 | 0,13 | 0,06*** | 0,23 | 0,01 | 0,09 | 0,03*** | 0,17 |
| Housing per household member[21] | 10,59 | 5,52 | 12,19*** | 7,02 | 3,59 | 1,09 | 3,62** | 1,13 |
| Number of household members | 3,45 | 1,45 | 1,11* | 1,56 | | | 1,14*** | |
| Family disposable income[22] | 1,13 | 0,91 | 0,49*** | 0,95 | 1,09 | 0,69 | 0,70 | 0,83 |
| Computer (share)[23] | 0,74 | 0,44 | 0,18** | 0,50 | 0,70 | 0,46 | 0,07*** | 0,46 |
| Foreign nationality (for Russia) or citizenship (for Italy) | 0,15 | 0,36 | 0,08 | 0,34 | 0,06 | 0,24 | | 0,21 |
| Moscow (share) | 0,09 | 0,28 | 0,03 | 0,28 | | | | |
| St. Petersburg (share) | 0,03 | 0,18 | | 0,18 | | | 0,27*** | |
| South of Italy (share)[24] | | | | | 0,33 | 0,47 | 0,06*** | 0,44 |
| Number of observations[25] | 4330 | | 26695 | | 11635 | | 155182 | |

Note: Significance of test of equal means between adult and youth in each country: *** p<0.01, ** p<0.05, * p<0.1.

## 5. Econometric estimation and results

In this paper we model the probability being unemployed for youth and adults. We start using binary choice models. The main specification is written as:

$$P\left(Y_i = 1 \middle| X\right) = F\left(x_i'\beta\right) \tag{1}$$

where $F(\cdot)$ is a normal distribution function. $Y_i = 1$ if a person is unemployed and 0 otherwise. It is so when latent variable $y_i^*$ in latent equation $y_i^* = x_i\beta + u_{1i}$ is greater than zero. Therefore,

[20] For Italian data it is the variable DB100 (Degree of urbanization) in EU-SILC. This dummy variable equals 1 for the densely populated area and 0 for the intermediate area and thinly populated area. For Russia this variable equals 1 for urban areas and 0 otherwise.

[21] For Italian data this variable means number of rooms for household. For Russian data it is housing in square meters per household member.

[22] Family disposable income is considered as the ratio of nominal family income to average income in the sample by the year (therefore we also adjust for effects of inflation). In Russia it is measured in rubles per household members. In Italy disposable income is measured in euros per family.

[23] This is the share of people in the sample who owns a computer.

[24] It includes both Southern regions and the two islands (i.e. Mezzogiorno's regions in a broad sense).

[25] Number of observations for Russia is for all variables except variable nationality. Not all people answered for these questions. The number of observations for these variables are presented in Table 7.

$Y_i = 1 \; if \; y_i^* > 0$. $x_i$ is the vector of explanatory variables, and $\beta$ is the vector of estimated coefficients. Therefore, we consider a probit model. However, in this case there is sample selection problem, because not all people are active in the labour market.

To take into account the non random selection of labour participation for both groups we estimate probit model with a correction for sample selection (Heckman Probit).[26] The binary outcome (1) will be observed only when the individual is active. Therefore, the selection equation is:

$$y_i^{select} = \left( z_i \beta + u_{2i} > 0 \right) \tag{2}$$

where $y_1^{select} = 1$ when the individual is active in the labour market. We suppose, that the error terms are, from equation (1) $u_{1i} \sim N(0,1)$, and from equation (2) $u_{2i} \sim N(0,1)$, and $corr(u_{1i}, u_{2i}) = \rho$. If $\rho = 0$ then we can reject non-random selection and we do not need to correct for selection. We test this hypothesis using Likelihood ratio test.

To estimate equations (1) and (2) we use the maximum likelihood method. Our explanatory variables for both equations are individual characteristics of the people in the sample (age, gender, education level, marital status, health, having a computer); the characteristics of households (disposable household income, housing size); the characteristics of location (urban area, unemployment rate in the region); time effects which control for macro conditions and the crisis effect. However, we use unique variables for the selection equation, which is the probability of being inactive in the labour market, such as student status and disability.

For the quantitative interpretation and comparisons between countries, we estimated the average marginal effects accounting for the fact that most of our variables are dummies. The average partial effect for the Heckman probit model is $APE_{x_k} = \sum_{i=1}^{N} \frac{\partial P\left(Y_i = 1 \middle| x_i, y_i^{select} = 1\right)}{\partial x_k} \Big/ N$ for continuous variables. We multiply the average marginal effects by the standard deviation of the corresponding regressor $x_k$ $\left(APE_{x_k} \cdot \sigma_{x_k}\right)$[27] in order to measure the significance of the variables, characterizing the degree of influence of the variable on the probability. The larger absolute value of $APE_{x_k} \cdot \sigma_{x_k}$, the larger the contribution of the standard deviation change of the variable $x_k$ to the probability of being unemployed (equation 1). For discrete variables the average partial effect is the difference in conditional probabilities of being unemployed for different values of the dummy variable, i.e. $APE_D = \sum_{i=1}^{N} \left[ P\left(Y_i = 1 \middle| x_i, D_i = 1, y_i^{select} = 1\right) - P\left(Y_i = 1 \middle| x_i, D_i = 0, y_i^{select} = 1\right) \right] \Big/ N$.

We estimate equation (1) and (2) separately for both groups in Russia and Italy. In fact, we tested the significance of no differences between the youth and adults for both countries and we can reject such a hypothesis at any significance level (Table 12 in Appendix).

[26] For recent empirical investigations making use of this methodology, see Kogan (2010), Pastore (2012a), Addabbo et al. (2013).

[27] Something similar was in (Peresetsky, 2007) and (Peresetsky et al., 2011). However, the author multiply coefficients from probit model on standard deviation of regressors.

5.1. *Econometric results for Italy*

The econometric results for Italy are presented in Table 6. Columns 1- 3 present the results for young people. Columns 4-6 present results for adults. We consider two types of models: probit (model 1) and Heckman probit (model 2). The selection equation (model 3) represents the probability of being active in the labour market.

First of all, we can see that the signs and significance of the coefficients are exactly the same for youth and adults (column 1, 2 and 4, 5 respectively). However, the correlation between unemployment and the selection equation, rho is significant for both groups. Therefore, it is important to control for non random selection and let us now focus on results for Heckman probit (model 2).

Firstly, we consider our main equation of interest, the unemployed equation. We can see that the **age** variable is highly significant for young people. The coefficient is negative, this means that probability of being unemployed decreases with age. For adults, the relationship between the probability of being unemployed and age is nonlinear, it is U-shaped. However, the threshold is 68.5 years, which is out of our sample. There is a significant and negative coefficient for **male**, i.e. women have a higher probability of being unemployed than men. However, the probability of being active is also higher for males for both age groups. **Marital status** is also significant for both the youth and adults: the probability of being unemployed is lower for married people. This can be explained by the fact that married people are more motivated to find a job (moreover, especially in Italy, young people who are "single" often live with their parents and are maintained by them if unemployed). **Bad health** leads, as expected, to higher a probability of being unemployed. If the person owns a **computer**, the probability of being unemployed decreases. This fact is associated with the education level of the person and the income level.

We obtained a significant coefficient for the secondary and tertiary **education** for adults. Higher education reduced the probability of being unemployed. However, for youth secondary education level increases the probability of being unemployed, and tertiary education is insignificant; for adults the opposite holds. A possible explanation is that less educated young people have a longer period, in the 15-24 age interval, to search for (and successfully find) a job; graduated individuals have at the best one or two years to search for (and find) a job: the probability of being unemployed consequently increases.[28] Another possible explanation is that highly educated people are frequently "choosy", i.e. tend to reject uninteresting offers or proposals not matching their skills and capabilities. Higher education decreases the unemployment risk for adults.

The probability of being unemployed is higher for more densely populated areas. The coefficients for the variable **urban** are significant and positive for both youth and adults. This can be explained by labor supply behavior: many people migrate to urban areas to search for a job.

As to **housing** conditions, such as the number of rooms, it is significant and positive for both youth and adults. Disposable household **income** (with respect to the average in the sample by the year) is highly significant and has negative coefficients for both age groups. Therefore, respondents from rich families have a higher probability of being employed.

[28] From this point of view, the age group 15-24 is misleading in the case of Italy (15-29 or 15-34 would be better). On the other hand, for many other control variables, this group is satisfactory; moreover, it is convenient to maintain the same age intervals for Italy and Russia.

**Table 6. Probit (model 1) and Heckman probit (model 2) for Italy, 2004-2011. Youth: 15-24 age. Adult: 25-64 age.**

| VARIABLES | Youth | | | Adult | | |
|---|---|---|---|---|---|---|
| | Unemployment equation | | Selection | Unemployment equation | | Selection |
| | model 1 | model 2 | model 2 | model 1 | model 2 | model 2 |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Student | | | -2.325*** | | | -0.971*** |
| | | | (0.024) | | | (0.016) |
| Age | -0.117*** | -0.139*** | 0.914*** | -0.092*** | -0.137*** | 0.282*** |
| | (0.007) | (0.008) | (0.085) | (0.006) | (0.009) | (0.003) |
| Age2 | | | -0.018*** | 0.001*** | 0.001*** | -0.004*** |
| | | | (0.002) | (0.000) | (0.000) | (0.000) |
| Disability | -0.071 | -0.026 | -0.181*** | 0.173*** | 0.204*** | -0.230*** |
| | (0.077) | (0.076) | (0.052) | (0.022) | (0.022) | (0.011) |
| Male | -0.118*** | -0.171*** | 0.283*** | -0.252*** | -0.378*** | 0.903*** |
| | (0.029) | (0.029) | (0.021) | (0.013) | (0.025) | (0.007) |
| Secondary education | 0.066** | 0.056* | 0.026 | -0.242*** | -0.286*** | 0.361*** |
| | (0.032) | (0.032) | (0.024) | (0.015) | (0.016) | (0.008) |
| Tertiary education | 0.062 | 0.051 | 0.082* | -0.174*** | -0.255*** | 0.641*** |
| | (0.057) | (0.056) | (0.042) | (0.018) | (0.023) | (0.010) |
| Married | -0.394*** | -0.278*** | -0.587*** | -0.295*** | -0.267*** | -0.165*** |
| | (0.082) | (0.081) | (0.051) | (0.014) | (0.015) | (0.008) |
| Urban area | 0.262*** | 0.274*** | -0.043** | 0.147*** | 0.153*** | -0.062*** |
| | (0.030) | (0.030) | (0.022) | (0.013) | (0.013) | (0.007) |
| Housing | 0.056*** | 0.067*** | -0.059*** | 0.012* | 0.016*** | -0.035*** |
| | (0.014) | (0.014) | (0.010) | (0.006) | (0.006) | (0.003) |
| Bad health | 0.438*** | 0.587*** | -0.797*** | 0.290*** | 0.361*** | -0.437*** |
| | (0.160) | (0.157) | (0.095) | (0.034) | (0.035) | (0.016) |
| Household income | -0.686*** | -0.689*** | 0.116*** | -0.520*** | -0.536*** | 0.185*** |
| | (0.029) | (0.029) | (0.013) | (0.014) | (0.014) | (0.005) |
| Computer | -0.172*** | -0.156*** | 0.036 | -0.144*** | -0.150*** | 0.077*** |
| | (0.033) | (0.032) | (0.025) | (0.014) | (0.014) | (0.008) |
| Unemployment rate | 0.005*** | 0.006*** | -0.005*** | 0.071*** | 0.074*** | -0.031*** |
| | (0.001) | (0.001) | (0.001) | (0.002) | (0.002) | (0.001) |
| Constant | 2.159*** | 2.804*** | -10.315*** | 0.992*** | 2.037*** | -5.080*** |
| | (0.171) | (0.179) | (0.869) | (0.117) | (0.214) | (0.061) |
| + time effects | | | | | | |
| Observations | 9,940 | | 32,978 | 126,578 | | 194,068 |
| Uncensored observations | | 9,940 | | | 126,578 | |
| Rho | | | -0.342*** | | | -0.291*** |
| | | | (0.040) | | | (0.050) |
| LR test (independent equations) (rho = 0), chi(1) | | | 75.03 | | | 32.29 |
| Log likelihood | -5206.36 | | -15035.02 | -23597.02 | | -116239.6 |
| Wald chi2(19) | 1464.34 | | 1416.80 | 10106.19 | | 8525.70 |
| % of correctly predicted (cut off 0.2) | 85.73 | 86.01 | | 32.36 | 32.46 | |

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

To take into account the macroeconomic conditions, in our model we also control for regional specific features, such as the regional **unemployment rate**[29]. For both groups, this variable is significant and has a positive sign. Therefore, if the average unemployment rate in the region is higher, the probability of being unemployed is higher too. There were significant coefficients for the **time dummies** after the 2007 year (not reported in the table). This clearly reflects the impact of the recent crisis. All coefficient for the 2008-11 years are significant and positive for both youth and adults. Therefore, the probability of being unemployed is much higher in the crisis period.

To test the quality of the estimated Heckman probit models, we estimated the percent of correctly predicted outcomes for a given cut off of 0.2. For youth the percent correctly predicted is higher than for adults, 86% and 32% respectively (see last row of Table 6). The reason is because the number of unemployed is higher for young people, therefore the model can better predict unemployment for them.

If we consider the selection equation (model 3), we can see that most of the variables which are significant in the unemployment equation, are also significant in the selection equation. However, they have the opposite sign, because they estimate the effect of the explanatory variables on the probability of being active in the labor market. Only marital status has the same sign in both equations. If the individual is married than the probability of being active is lower; this may be explained by the behaviour of women: in many Italian regions (especially in the South) they do not look for jobs if married.[30] The student status is intentionally included only in the selection equation: it is significant for both age groups and is negative. This means that the probability of being active is lower—as expected—when the individual is a student.

We also control for immigrants (Table 8 in Appendix). Our results show that **immigrants** have a smaller chance of being unemployed if they are young: this can be explained by the fact that young people decide to migrate to Italy only if they have a chance to find a job (the coefficient is not significant for adult individuals). Finally, Table 9 in Appendix presents the results differentiated by gender.

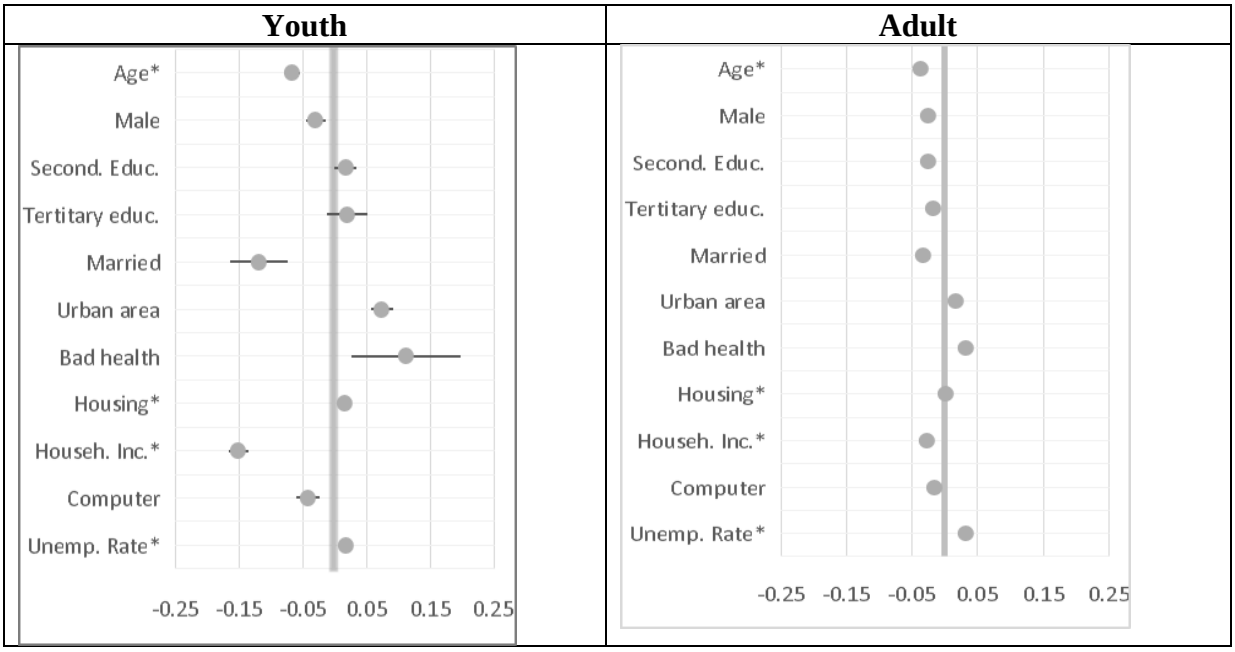
Figure 2 presents a graphical representation of average partial effects (APE), which we discussed above. We compare, for the different regressors, the marginal effects for youth and adult individuals. In general, we find that APEs are much higher for young individuals than for adults. Therefore, considering almost all regressors, they are more significant for the youth. However, the macro level variable, unemployment rate, has a higher influence on the probability of being unemployed for adults.

Considering the individual regressors, APE of the variable urban is higher for youth. The household income, marital status and bad health have the most significant effect on the probability of being unemployed for young people: an increase of household income by one standard deviation decreases the probability of being unemployed by 0.15. Bad health decreases the probability of being unemployed by 0.11 and marital status decreases this probability by the same value. An increase in age by one standard deviation raises the probability of being unemployed by approximately 0.07 for the youth and 0.04 for the adult. Therefore, age is more critical for young individuals.

[29] We consider 5 regions (Nuts-1 level of Eurostat) for Italy. We use the regional youth unemployment rate for youth people (15-24 age) and the regional total unemployment rate for the adult.

[30] On the other hand, if they do look for jobs, they are more likely to find them, perhaps due to more intensive search efforts (this explains the negative sign in the unemployment equation).

*Figure 2. Comparison of APE and their confidence intervals for youth and adult unemployed in Italy.*




Note: * is for continuous variables.

5.2. *Econometric results for Russia*

The econometric results for Russia are presented in Table 7. Columns 1-3 show the results for young people and the other columns for adults. First of all, we compare results for probit (model 1) and Heckman probit (model 2). The selection equation (model 3) refers to the probability of being active.

An important difference between the two models (1 and 2) is found only for the secondary education variable, for youth unemployment, and for the regional unemployment rate for adult unemployment. These variables are insignificant in the unemployment equation with selection. All other variables have the same signs and significance for both types of models. However, the correlation between disturbances in the selection and in the unemployment equation are significant. Therefore, we discuss below the results of the Heckman probit model.

Firstly, we consider individual characteristics. There is significant result for **age**, which has a negative coefficient for both age groups, as in Italy. There is no significant nonlinear relationship between age and the probability of being unemployed. However, there is nonlinearity by age in the selection equation for youth and adult individuals. **Gender** is significant only for adults and the probability of being unemployed is higher for men. However, gender is significant in the selection equation for both age groups and the "male" variable has a positive sign. Therefore, the probability of being active in the labour market is higher for men. For young people both **education** proxies are insignificant; on the contrary, for adults both education levels are significant and have a negative sign. **Marital** status is significant only for youth, showing a reduced probability of being unemployed if married, as in Italy. Bad **health** is significant for unemployment only for adults. The presence of a computer is a significant factor only for adults: it decreases the probability of being unemployed.

**Table 7. Probit (model 1) and Heckman probit (model 2) for Russia, 2004-2011. Youth: 15-24 age. Adult: 25-60 age.**

| VARIABLES | Youth | | | Adult | | |
|---|---|---|---|---|---|---|
| | Unemployment equation | | Selection | Unemployment equation | | Selection |
| | model 1 | model 2 | model 2 | model 1 | model 2 | model 2 |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Student | | | -2.088*** | | | -1.917*** |
| | | | (0.046) | | | (0.180) |
| Disability | | | -0.577*** | | | -0.994*** |
| | | | (0.119) | | | (0.035) |
| Age | -0.146*** | -0.055*** | 0.720*** | -0.010*** | -0.010*** | 0.178*** |
| | (0.014) | (0.014) | (0.117) | (0.002) | (0.001) | (0.008) |
| Age2 | | | -0.014*** | | | -0.002*** |
| | | | (0.003) | | | (0.000) |
| Male | 0.018 | 0.072 | 0.251*** | 0.151*** | 0.182*** | 0.378*** |
| | (0.050) | (0.048) | (0.036) | (0.028) | (0.028) | (0.020) |
| Secondary education | -0.134** | -0.060 | 0.140*** | -0.122*** | -0.099*** | 0.224*** |
| | (0.060) | (0.058) | (0.045) | (0.035) | (0.034) | (0.023) |
| Tertiary education | 0.080 | 0.116 | 0.115 | -0.110*** | -0.082** | 0.308*** |
| | (0.086) | (0.083) | (0.076) | (0.039) | (0.039) | (0.028) |
| Married | -0.161*** | -0.170*** | -0.226*** | -0.044 | -0.052 | -0.174*** |
| | (0.060) | (0.057) | (0.046) | (0.033) | (0.032) | (0.023) |
| Urban area | 0.014 | 0.051 | 0.377*** | 0.103*** | 0.123*** | 0.213*** |
| | (0.062) | (0.058) | (0.043) | (0.034) | (0.033) | (0.022) |
| Bad health | 0.120 | -0.049 | -0.362*** | 0.253*** | 0.157*** | -0.412*** |
| | (0.175) | (0.167) | (0.115) | (0.053) | (0.056) | (0.032) |
| Housing | 0.003 | 0.003 | 0.002 | -0.003 | -0.003 | 0.006*** |
| | (0.005) | (0.004) | (0.003) | (0.002) | (0.002) | (0.001) |
| Household income | -0.311*** | -0.266*** | 0.113*** | -0.281*** | -0.270*** | 0.157*** |
| | (0.038) | (0.037) | (0.022) | (0.024) | (0.024) | (0.014) |
| Computer | 0.120* | 0.081 | 0.330*** | -0.162*** | -0.123*** | 0.409*** |
| | (0.063) | (0.060) | (0.046) | (0.034) | (0.034) | (0.024) |
| Unemployment rate | 0.018*** | 0.012** | -0.030*** | 0.010** | 0.006 | -0.040*** |
| | (0.007) | (0.006) | (0.004) | (0.005) | (0.005) | (0.003) |
| Constant | 2.179*** | -0.056 | -8.168*** | -0.979*** | -1.046*** | -2.431*** |
| | (0.301) | (0.316) | (1.166) | (0.092) | (0.091) | (0.180) |
| +time effects | | | | | | |
| Observations | 4,330 | | 9,350 | 26,695 | | 31,553 |
| Uncensored observations | | 4,330 | | | 26,695 | |
| Rho | | | 0.842*** | | | 0.453*** |
| | | | (0.072) | | | (0.128) |
| LR test (independent equations) (rho = 0), chi(1) | | | 179.06 | | | 15.89 |
| Log likelihood | -1684.43 | | -4750.91 | -4744.01 | | -15972.4 |
| Wald chi2(18) | 331.46 | | 112.34 | 472.84 | | 353.89 |
| % of correctly predicted (cut off 0.2) | 51.28 | 44.78 | | 0.08 | 0.4 | |

Note: Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Secondly, we analyzed **region** specific features. The probability of being unemployed is higher in **urban areas** for adults. A possible reason is the operation of labour supply effects: people

move to urban areas to search for jobs. The average **unemployment rate**[31] in the region increases the probability of being unemployed for youth and reduces the probability of being active for both age groups. Among the various household characteristics, only disposable **household income** is highly significant and has a negative coefficient, as in Italy. For Russia, too, we find significant **time effects** (with negative signs in the crisis period), however not all year dummies are significant.

The variables in the selection equation have opposite signs compared to the unemployment equation for both Russia and Italy. Two specific variables have been intentionally included only in the selection equation: disability and student status; both of them are significant and have negative sign for both age groups.

The percentage of correctly predicted outcomes (unemployed individuals) in Russian models is lower than for Italy. That is due to the lower number of unemployed people in the sample. It is 44.4% for the youth unemployment model and only 0.4% for the adult one. Therefore, the model has low predictive power for adult unemployment in Russia.

*Figure 3. Comparison of APE and their confidence intervals for youth and adult unemployed in Russia.*

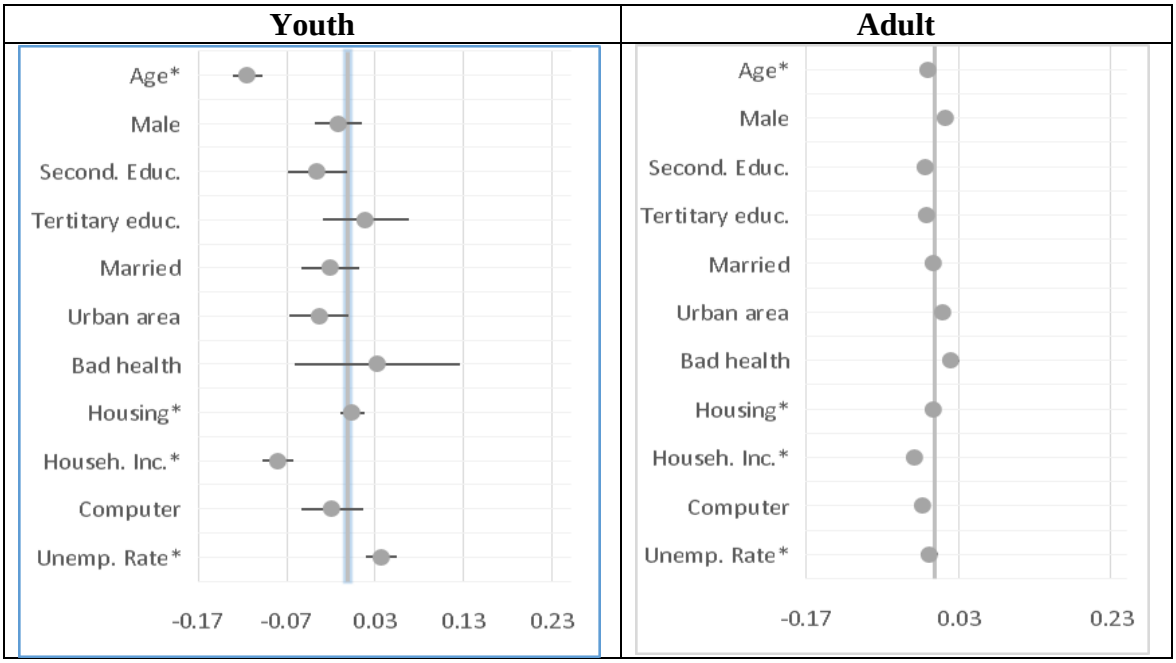



Figure 3 presents APE for youth and adult unemployment equations. As for Italy, APEs for the youth are higher than for adults. The highest APE is for the age variable. A rise of age by one standard deviation decreases the probability of being unemployed of young individuals by 0.11. High marginal effects are also found in case of household income (-0.08). The APE of the regional unemployment rate is significant only for the youth (0.037).

We also considered a specification including the variable of non-Russian **nationality**, (Table 10 in Appendix). These results should be discussed separately since the number of observations dramatically reduces in this case. This variable (non-Russian nationality) is significant only in the unemployment equation for adults and has a positive sign, as in Italy. However, a non-Russian nationality is significant also in the selection equation and has a negative sign for both age groups.

[31] We consider all regions of Russia which are included in RLMS-HSE data. We use the regional youth unemployment rate for the youth (under 29 years) and the total unemloyment rate for the adult.

5.3. *A synthesis of results for both countries*

We compare the results for both countries by contrasting the APE (see Figures 2 and 3). The highest negative effect for the probability of being unemployed for youth is found—for both countries—for household income. The APE of marital status and bad health, which are important for young Italian individuals, are insignificant for young Russians. There is also a difference concerning the urban area variable: the probability of being unemployed is lower for young Russians who live in urban areas, but there is a positive (increasing) effect in the Italian case. Bad health has a strong effect on the employment status, for adult people both in Italy and Russia: the APE is 0.03 and 0.02 respectively. The housing condition has very low effect on the employment status, unlike household incomes.

Considering the partial effects of adults, the APE of household income for adult is the same (-0.027) in Russia and Italy. There is strong gender effect for adults. However, this variable has different signs in different groups. In Russia adult men have a higher probability of being unemployed than women (0.01); in Italy, however, women have higher probability (0.026) of being unemployed than men. Education is a significant factor only for adults, however its effect is weak. Adults with secondary education have a lower probability of being unemployed, than people with primary education, by 0.01 in Russia, and 0.025 in Italy. If an adult has tertiary education, the probability of being unemployed is smaller by 0.011 in Russia, and 0.017 in Italy.

Therefore, for young people the key factors explaining their (un)employment status are household incomes and age for both countries, the regional unemployment rate for Russia, and marital status, urban area and bad health for Italy. Individual characteristics, in general, are more important than the regional ones.

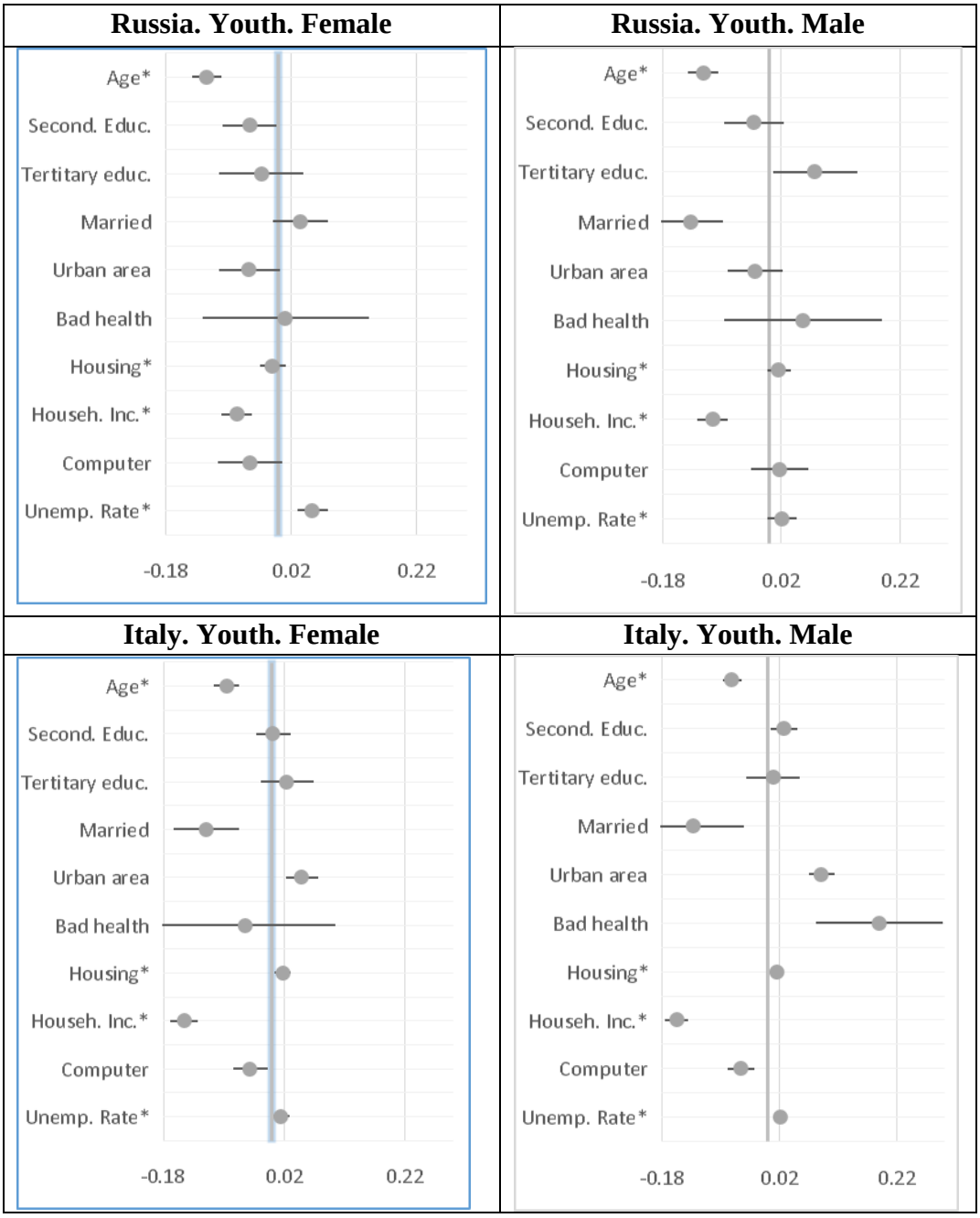
For adults, regional specific characteristics are also important; and, as for youth, individual characteristics provide more significant contributions to the explanation of employment status, because standardized coefficients for individual characteristics are higher and their confidence intervals do not overlap. In most cases, the APEs for Italian models are higher than for Russian models (in fact the unemployment risk is higher in Italy and so also the elasticities).

5.4. *Additional evidence*

As additional evidence we consider the differences in characteristics of youth unemployment in Italy and Russia by gender. Wald tests show that there are significant differences between genders in both countries (Table 12 in Appendix). Estimation results of Heckman probit models are in Table 9 and 11 in Appendix for Italy and Russia respectively.

Figure 3 presents the APE for both countries and gender. First of all, we find that when APE is significant, it has the same sign for youth females and males in both countries.

*Figure 3. Comparison of APE and their confidence intervals for Russia and Italy for youth by gender.*




Tertiary education is significant and has a positive sign only for young Russian men; for young Italian men we find the same effect for secondary education: the explanation is that, after finishing school or university, they have little time to find a job (when they start looking for it). In Russia secondary education reduces the unemployment risk for females. Marital status is significant and has a negative sign for females and males in Italy and only for males in Russia. Bad health is an important factor only for Italian men.

Young individuals with higher household income exhibit a lower probability of being unemployed, both in Italy and in Russia; however, in Italian models the APE is higher. Computer ownership is a significant variable only for Italian females and males: having a computer reduces the probability of being unemployed and it makes more efficient the job search process.

Concerning the regional characteristics, the regional unemployment rate is significant and has a positive sign for all groups. However, the APE for Russian females is the highest. Urban area is an important factor for the unemployment status only for Italian females and males: the signs are positive because labour supply effects are probably dominant; many young people migrate to Italian urban areas in search for jobs or remain in such areas after finishing school (or university) but stay unemployed for a certain period.

## 6. Conclusions

Youth unemployment is much higher than adult unemployment and has been particularly sensitive to the economic cycle, reaching after the recent crisis values (in 2013) as high as 59% in Greece, 56% in Spain, 50% in Croatia, 40% in Italy. In Russia, it is lower—also thanks to informal activities of young people—but it has also increased after the crisis.

In several studies, individual and family characteristics were found to be important elements in shaping the differences and trends in youth unemployment. However, we found that such characteristics are more important for adults rather than young people. For instance, this is the case for education (especially tertiary education). Also gender is more important for adults: females face higher risk of unemployment in Italy, while the opposite is true in Russia.

These results have been obtained using a Heckman Probit model. We analysed the 2004-2011 period for Italy and Russia. Our key variable of interest was the unemployment status of the respondents. We selected observations relating to young people (aged 15-24 years) and, for comparison purposes, adults (aged 25-60 for Russia and 25-64 for Italy). Our explanatory variables included individual characteristics; the characteristics of households; the characteristics of location (region); and time effects (to control for macro conditions and crisis effects). For a quantitative interpretation and comparisons between countries, we also estimated average marginal effects: in fact, most of our variables are dummies. For young people APEs are much higher than for adults in both countries.

The highest negative marginal effect for the probability of being unemployed, for both countries and age groups, is disposable family income. Moreover, the unemployment risk decreases with age of young people (especially in Russia) and marital status (being single increases the risk) in Italy.

The highest positive (marginal) effects are for the regional unemployment rate, which leads to higher unemployment risk. Bad health has a high significant positive effect on unemployment especially in Italy. In general, regional characteristics are less important than individual and family features as risk factors of unemployment. Finally[32] the time effects are significant and, especially for Italy, they led to increased unemployment risk during the recent crisis period (2008-2011).

To conclude, youth unemployment is detrimental to society because it is a waste of resources; it causes a permanent loss of human capital; it affects health and diminishes the well-being of society, not only for the unemployed (e.g. for anxiety over job security). Bell and Blanchflower (2011) found evidence that spells of youth unemployment have harmful impacts on a number of outcomes—happiness, job satisfaction, wages and health—even many years later.

[32] For future research, we could think of further improvements in the empirical investigations, for instance considering some age classes different from 15-24 years (e.g. 15-29 years would be more appropriate for certain explanatory variables in the case of Italy) or allowing for the type of university degrees (e.g. humanistic vs. scientific).

Regarding the policy implications of our study, firstly we emphasize that appropriate "school-to-work" transition services (as specified in Section 3) are important, since our empirical results have shown that higher education, by itself, is not enough to guarantee young people higher employment. Moreover, there is also a need for targeted policies, differentiated by gender (for instance helping women in finding jobs in Italy)[33], supporting people with bad health or youngsters living in under-performing regions in both countries. In fact, we have econometrically detected the importance of the regional unemployment rate in affecting the individual probability of unemployment. The risk of rising—especially after the recent crisis—and persistent unemployment is much higher in such regions. Only through effective policies we can avoid the threat that a "lost generation" will be with us for many years to come.

## References


Addabbo T., Rodríguez-Modroño P. and Gálvez-Muñoz L. (2013), "Youth living in a couple. How women's labour supply adapts to the crisis. The case of Spain", CAPPaper 114, Università di Modena e Reggio Emilia.

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

Bartolucci F., Choudhry M., Marelli E. and Signorelli M. (2011), "Financial Crises and Labour Market: Beyond the Okun's Law", presented at the 16th World Congress *International Economic Association*, Tsinghua University, Beijing, July 4-8, 2011.

Bassanini A. and Duval R. (2009), "Unemployment, Institutions, and Reform Complementarities: Re-Assessing the Aggregate Evidence for OECD Countries", *Oxford Review of Economic Policy,* 25: 40–59.

Bell D.N.F. and Blanchflower D.G. (2011), "Young People and the Great Recession", *Oxford Review of Economic Policy*, 27, 2, 241-267.

Blanchflower D.G. and Freeman R.B. (eds) (2000), *Youth Employment and Joblessness in Advanced Countries*, Chicago, IL, University of Chicago Press and NBER.

Bruno G., Marelli E. and Signorelli M. (2014), "The rise of NEET and Youth Unemployment in EU regions after the crisis", *Comparative Economic Systems*, submitted.

Burkert C. and Siebert H. (2007), "Labour market outcomes after vocational training in Germany : equal opportunities for migrants and natives?", IAB Discussion Paper n. 200731.

Caroleo F.E. and Pastore F. (2003), "Youth participation in the labour market in Germany, Spain and Sweden", in T. Hammer (ed.), *Youth unemployment and social exclusion in Europe A comparative study*, Policy Press, University of Bristol, 109-133.

Caroleo F.E. and Pastore F. (2007), "The Youth Experience Gap: Explaining Differences Across EU Countries", *Quaderni del Dipartimento di Economia, Finanza e Statistica*, Università di Perugia, 41.

Choudhry M., Marelli E. and Signorelli M. (2013), "Youth and the total unemployment rate: The impact of policies and institutions *Rivista internazionale di Scienze Sociali*, 121, 1, 63-86..

Choudhry M., Marelli E. and Signorelli M. (2012), "Youth Unemployment Rate and Impact of Financial Crises", ", *International Journal of Manpower*, 33, 1, 76-95.


[33] This is especially true for Southern Italian regions. In Russia, on the contrary, the unemployment risk is higher for men, but more for adults than for youngsters.

Demidova O., Marelli E. and Signorelli M. (2013), "Spatial Effects on Youth Unemployment Rate: The Case of Eastern and Western Russian Regions", *Eastern European Economics*, forthcoming.

Demidova O., Marelli E. and Signorelli M. (2014), "Youth Labour Market Performance in the Russian and Italian Regions", *Economic Systems*, submitted.

De Santis M. (2008), "Il rapporto tra i giovani e il mercato del lavoro: La difficile condizione nel Mezzogiorno", *Rivista Economica del Mezzogiorno*, 22, 3-4, 713-34.

Destefanis S. and Mastromatteo G. (2010), "Labour-market Performance in the OECD: Some Recent Cross-country Evidence", *International Journal of Manpower*, 31, 7, 713-31.

Dolado J.J., Jansen M., Felgueroso F., Fuentes A. and Wolfl A. (2013), "Youth Labour Market Performance in Spain and its Determinants: A Micro-level Perspective", OECD Economics Department Working Papers, n. 1039.

Eurofound (2012), *NEETs – Young people not in employment, education or training: Characteristics, costs and policy responses in Europe*, Publications Office of the European Union, Luxembourg.

European Commission (2010), *Youth on the move*, Publications Office of the European Union, Luxembourg.

Formez (2012), *I servizi per l'impiego nell'ottica della transizione scuola-lavoro. Un'analisi comparata*, Roma.

Gimpelson V.E., Kapelyushnikov R.I. and Lukyanova A. (2010). "Employment Protection Legislation in Russia: Regional Enforcement and Labor Market Outcomes", *Comparative Economic Studies*, 52, 4, 611-636.

Hérault N., Kostenko W., Marks G. and Zakirova R. (2012), "The Effects of Macroeconomic Conditions on the Education and Employment Outcomes of Youth", *Australian Journal of Labour Economics*, 15, 1, 17-36.

IMF (2010), "Unemployment Dynamics During Recessions and Recoveries: Okun's Law and Beyond", Chapter 3 in *World Economic Outlook: Rebalancing Growth*, Washington.

Kelly E., McGuinness S., O'Connell P., Haugh D. and González Pandiella A. (2013), "Transitions in and out of Unemployment among Young People in the Irish Recession", OECD Economics Department Working Papers, n. 1084.

Kogan I. (2010), "New Immigrants – Old Disadvantaged Patterns? Labour Market Integration of Recent Immigrants into Germany", in Gozdziak E. – International Organization for Migration (IOM), International Migration, Blackwell Publ., 91-117.

Kostoris Padoa Schioppa F. and Lupi C. (2002), "Family Income and Wealth, Youth Unemployment and Active Labour Market Policies", *International Review of Applied Economics*, 16, 4, 407-16.

Marelli E., Patuelli R. and Signorelli M. (2012), "Regional Unemployment in the EU before and after the Global Crisis", *Post-Communist Economies*, 2.

Nickell S. and Layard R. (1999), "Labour market institutions and economic performance", in: O. Ashenfelter and D. Card (eds.), *Handbook of Labor Economics*, ch. 46, Amsterdam, Elsevier.

OECD (2005), *Education at Glance*, Paris.

OECD (2006), *Employment Outlook*, Paris.

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

O'Higgins N. (2012), "This Time It's Different? Youth Labour Markets during 'The Great Recession' ", *Comparative Economic Studies,* 3.

Pastore F. (2012a), "To Study or to Work? Education and Labor-Market Participation of Young People in Poland", *Eastern European Economics*, 50, 3, 49–78.

Pastore F. (2012b), "Youth Unemployment in Italy at the Time of the New Great Depression", Friedrich-Ebert-Stiftung, International Dialogue, Berlin, November.

Pastore F. (2012c), "Primum vivere . . . industrial change, job destruction and the geographical distribution of unemployment", *IZA Journal of European Labor Studies*, 1:7.

Peresetsky A.A. (2007). "Modeli veroyatnosti defolta banka" (Probability default models for the banks). *Economics and Mathematical Methods*, 43 (3), 37–62.

Peresetsky A., Karminsky A., Golovan S. (2011). Probability of default models of Russian banks. *Economic Change and Restructuring*, 44(4), 297–334.

Quintini G. and Manfredi T. (2009), "Going Separate Ways? School-to-Work Transitions in the United States and Europe", *OECD Social, Employment and Migration Working Paper*, 90.

Scarpetta S., Sonnet A. and 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*, 6.

Shilov A. and Möller J. (2009), "The wage curve in Russia, 1995–2005". *Economics Letters* 102, 90–92.

## APPENDIX

**Table 8. Probit (model 1) and Heckman probit (model 2) with nationality variable for Italy, 2004-2011. Youth: 15-24 age. Adult: 25-60 age.**

| | Youth | | Adult | |
|---|---|---|---|---|
| VARIABLES | Unemployment equation | Selection | Unemployment equation | Selection |
| | (1) | (2) | (3) | (4) |
| Student | | -2.324*** | | -0.966*** |
| | | (0.024) | | (0.016) |
| Disability | -0.040 | -0.180*** | 0.157*** | -0.229*** |
| | (0.076) | (0.052) | (0.022) | (0.011) |
| Age | -0.140*** | 0.914*** | -0.029*** | 0.282*** |
| | (0.008) | (0.085) | (0.001) | (0.003) |
| Age2 | | -0.018*** | | -0.004*** |
| | | (0.002) | | (0.000) |
| Male | -0.172*** | 0.283*** | -0.182*** | 0.902*** |
| | (0.029) | (0.021) | (0.017) | (0.007) |
| Secondary education | 0.042 | 0.028 | -0.215*** | 0.360*** |
| | (0.032) | (0.024) | (0.016) | (0.008) |
| Tertiary education | 0.038 | 0.084** | -0.131*** | 0.641*** |
| | (0.056) | (0.042) | (0.020) | (0.010) |
| Married | -0.187** | -0.596*** | -0.320*** | -0.170*** |
| | (0.082) | (0.052) | (0.013) | (0.008) |
| Urban area | 0.274*** | -0.043** | 0.142*** | -0.062*** |
| | (0.030) | (0.022) | (0.013) | (0.007) |
| Housing | 0.053*** | -0.058*** | 0.011* | -0.034*** |
| | (0.014) | (0.010) | (0.006) | (0.003) |
| Bad health | 0.592*** | -0.798*** | 0.251*** | -0.437*** |
| | (0.158) | (0.095) | (0.035) | (0.016) |
| Household income | -0.698*** | 0.116*** | -0.495*** | 0.188*** |
| | (0.029) | (0.013) | (0.014) | (0.005) |
| Computer | -0.185*** | 0.039 | -0.141*** | 0.079*** |
| | (0.032) | (0.025) | (0.014) | (0.008) |
| Unemployment rate | 0.005*** | -0.005*** | 0.069*** | -0.030*** |
| | (0.001) | (0.001) | (0.002) | (0.001) |
| Immigrant | -0.692*** | 0.044 | 0.017 | 0.049*** |
| | (0.071) | (0.049) | (0.029) | (0.018) |
| Constant | 2.947*** | -10.326*** | -0.352*** | -5.102*** |
| + time effects | (0.181) | (0.870) | (0.043) | (0.061) |
| Observations | | 32,978 | | 194,068 |
| Uncensored observations | 9,940 | | 126,578 | |
| Rho | | -0.341*** | | 0.175*** |
| | | (0.040) | | (0.031) |
| LR test (independent equations) (rho = 0), chi(1) | | 74.78 | | 32.13 |
| Log likelihood | | -14982.64 | | -116236.2 |
| Wald chi2(20) | | 1499.44 | | 8528.53 |
| Observations | | 32,978 | | 194,068 |
| Number of uncensored observations | 9,940 | | 126,578 | |
| % of correctly predicted (cut off 0.2) | 85.97 | | 32.42 | |

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

**Table 9. Probit (model 1) and Heckman probit (model 2) for Italy by gender, 2004-2011. Youth: 15-24 age.**

| | Female | | Male | |
|---|---|---|---|---|
| VARIABLES | Unemployment equation | Selection | Unemployment equation | Selection |
| | (1) | (2) | (3) | (4) |
| Student | | -2.275*** | | -2.395*** |
| | | (0.035) | | (0.033) |
| Disability | -0.018 | -0.066 | -0.050 | -0.284*** |
| | (0.110) | (0.074) | (0.106) | (0.073) |
| Age | -0.157*** | 0.919*** | -0.126*** | 0.944*** |
| | (0.012) | (0.128) | (0.010) | (0.116) |
| Age2 | | -0.019*** | | -0.019*** |
| | | (0.003) | | (0.003) |
| Secondary education | -0.063 | 0.238*** | 0.131*** | -0.149*** |
| | (0.050) | (0.037) | (0.041) | (0.033) |
| Tertiary education | 0.003 | 0.287*** | 0.059 | -0.131** |
| | (0.078) | (0.057) | (0.084) | (0.063) |
| Married | -0.181* | -0.680*** | -0.591*** | 0.638*** |
| | (0.097) | (0.057) | (0.160) | (0.191) |
| Urban area | 0.170*** | -0.007 | 0.348*** | -0.065** |
| | (0.045) | (0.031) | (0.040) | (0.030) |
| Housing | 0.074*** | -0.071*** | 0.063*** | -0.047*** |
| | (0.022) | (0.015) | (0.019) | (0.014) |
| Bad health | 0.062 | -0.765*** | 0.854*** | -0.819*** |
| | (0.265) | (0.150) | (0.201) | (0.124) |
| Household. income | -0.648*** | 0.116*** | -0.730*** | 0.121*** |
| | (0.043) | (0.018) | (0.039) | (0.018) |
| Computer | -0.158*** | 0.123*** | -0.153*** | -0.060* |
| | (0.049) | (0.035) | (0.043) | (0.035) |
| Unemployment rate | 0.004*** | -0.003** | 0.007*** | -0.007*** |
| | (0.002) | (0.001) | (0.002) | (0.001) |
| Constant | 3.312*** | -10.591*** | 2.267*** | -10.168*** |
| | (0.275) | (1.315) | (0.234) | (1.185) |
| Observations | | 16,329 | | 16,649 |
| Uncensored observations | 4,072 | | 5,868 | |
| Rho | | -0.385*** | | -0.292*** |
| | | (0.059) | | (0.054) |
| LR test (independent equations) (rho = 0), chi(1) | | 43.97 | | 29.17 |
| Log likelihood | | -6942.736 | | -7943.542 |
| Wald chi2(18) | | 590.57 | | 849.83 |
| % of correctly predicted (cut off 0.2) | 88.07 | | 83.96 | |

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

**Table 10. Probit (model 1) and Heckman probit (model 2) with nationality variable for Russia, 2004-2011. Youth: 15-24 age. Adult: 25-60 age.**

| VARIABLES | Youth | | Adult | |
|---|---|---|---|---|
| | Unemployment equation | Selection | Unemployment equation | Selection |
| | (1) | (2) | (3) | (4) |
| Student | | -2.049*** | | -1.594*** |
| | | (0.061) | | (0.245) |
| Disability | | -0.709*** | | -1.107*** |
| | | (0.161) | | (0.047) |
| Age | -0.076*** | 0.879*** | -0.011*** | 0.174*** |
| | (0.020) | (0.159) | (0.002) | (0.011) |
| Age2 | | -0.018*** | | -0.002*** |
| | | (0.004) | | (0.000) |
| Male | 0.107* | 0.330*** | 0.181*** | 0.427*** |
| | (0.063) | (0.048) | (0.037) | (0.026) |
| Secondary education | -0.021 | 0.198*** | -0.159*** | 0.215*** |
| | (0.074) | (0.059) | (0.046) | (0.030) |
| Tertiary education | 0.080 | 0.140 | -0.112** | 0.320*** |
| | (0.105) | (0.095) | (0.051) | (0.037) |
| Married | -0.188*** | -0.208*** | -0.059 | -0.187*** |
| | (0.072) | (0.058) | (0.042) | (0.030) |
| Urban area | 0.059 | 0.378*** | 0.154*** | 0.249*** |
| | (0.078) | (0.057) | (0.044) | (0.028) |
| Bad health | 0.082 | -0.457*** | 0.181** | -0.424*** |
| | (0.210) | (0.154) | (0.076) | (0.042) |
| Housing | 0.004 | 0.004 | -0.002 | 0.005*** |
| | (0.006) | (0.004) | (0.003) | (0.002) |
| Household income | -0.354*** | 0.094*** | -0.245*** | 0.165*** |
| | (0.050) | (0.029) | (0.030) | (0.019) |
| Computer | 0.115 | 0.448*** | -0.129*** | 0.382*** |
| | (0.084) | (0.064) | (0.043) | (0.030) |
| Unemployment rate | -0.007 | -0.023*** | 0.005 | -0.028*** |
| | (0.010) | (0.007) | (0.007) | (0.005) |
| Non Russian nationality | 0.004 | -0.220*** | 0.150*** | -0.236*** |
| | (0.087) | (0.064) | (0.049) | (0.034) |
| Constant | 0.506 | -10.117*** | -1.059*** | -2.709*** |
| +time effects | (0.453) | (1.601) | (0.148) | (0.241) |
| Observations | | 5,420 | | 18,699 |
| Uncensored observations | 2710 | | 15829 | |
| Rho | | 0.782*** | | 0.431** |
| | | (0.100) | | (0.178) |
| LR test (independent equations) (rho = 0), chi(1) | | 82.75 | | 7.68 |
| Log likelihood | | -2789.638 | | -9311.827 |
| Wald chi2(19) | | 88.84 | | 219.28 |
| % of correctly predicted (cut off 0.2) | 44.27 | | 0.97 | |

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

**Table 11. Probit (model 1) and Heckman probit (model 2) for Russia by gender, 2004-2011. Youth: 15-24 age.**

| VARIABLES | Female | | Male | |
|---|---|---|---|---|
| | Unemployment equation | Selection | Unemployment equation | Selection |
| | (1) | (2) | (3) | (4) |
| Student | | -2.142*** | | -2.080*** |
| | | (0.066) | | (0.067) |
| Disability | | -0.490*** | | -0.778*** |
| | | (0.147) | | (0.207) |
| Age | -0.059*** | 0.743*** | -0.056*** | 0.710*** |
| | (0.020) | (0.166) | (0.020) | (0.170) |
| Age2 | | -0.015*** | | -0.014*** |
| | | (0.004) | | (0.004) |
| Secondary education | -0.043 | 0.256*** | -0.085 | 0.010 |
| | (0.080) | (0.061) | (0.087) | (0.072) |
| Tertiary education | -0.018 | 0.168* | 0.315*** | 0.125 |
| | (0.117) | (0.097) | (0.119) | (0.136) |
| Married | -0.148* | -0.569*** | -0.208** | 0.599*** |
| | (0.077) | (0.059) | (0.089) | (0.092) |
| Urban area | 0.028 | 0.406*** | 0.055 | 0.334*** |
| | (0.088) | (0.061) | (0.080) | (0.063) |
| Bad health | -0.159 | -0.415*** | 0.059 | -0.340* |
| | (0.244) | (0.151) | (0.235) | (0.188) |
| Housing | -0.003 | 0.007 | 0.009 | -0.005 |
| | (0.007) | (0.005) | (0.006) | (0.005) |
| Household income | -0.226*** | 0.105*** | -0.315*** | 0.139*** |
| | (0.052) | (0.032) | (0.052) | (0.032) |
| Computer | 0.042 | 0.431*** | 0.124 | 0.159** |
| | (0.088) | (0.065) | (0.083) | (0.069) |
| Unemployment rate | 0.026*** | -0.024*** | -0.002 | -0.040*** |
| | (0.009) | (0.006) | (0.009) | (0.006) |
| Constant | -0.147 | -8.474*** | 0.255 | -7.526*** |
| +time effects | (0.460) | (1.664) | (0.444) | (1.685) |
| Observations | | 4,810 | | 4,540 |
| Uncensored observations | 2133 | | 2188 | |
| Rho | | 0.913*** | | 0.750*** |
| | | (0.109) | | (0.100) |
| LR test (independent equations) (rho = 0), chi(1) | | 100.67 | | 70.77 |
| Log likelihood | | -2422.518 | | -2221.964 |
| Wald chi2(17) | | 62.04 | | 65.50 |
| Observations | | 4,810 | | 4,540 |
| Uncensored observations | 2133 | | 2188 | |
| % of correctly predicted (cut off 0.2) | 48.08 | | 51 | |

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

**Table 12. Model comparison using Wald test.**

| | Russia | | Italy | |
|---|---|---|---|---|
| | Adult vs Young (Table 7) | Young Male vs Young Female (Table 11) | Adult vs Young (Table 6) | Young Male vs Young Female (Table 9) |
| Wald statistics | Chi (22) = 172.71 | Chi2( 22) = 210.39 | Chi2 (22) = 1649.49 | Chi2 (22) = 401.04 |
| p-value | 0.000 | 0.000 | 0.000 | 0.000 |

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