

# NEGOTIATE

Overcoming early job-insecurity in Europe

## Are recessions good for human capital accumulation?

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# Are recessions good for human capital accumulation? \*

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## Abstract

This paper is the first to investigate to what extent the high levels of joblessness brought by the Great Recession across Europe have translated into higher school attendance among youth. Using cross-sectional and longitudinal data from the EU-SILC on 28 countries, we establish a robust counter-cyclical relationship between rising unemployment rates and school enrollment. The same is true for transitions back to education. However, our analysis by subgroups reveals a worrisome trend by which youths belonging to most disadvantaged backgrounds (measured by low household income) became less likely to enroll in University studies. The austerity measures and educational cutbacks imposed during the recession, not only changed the pattern of educational decisions among young Europeans, they also made the opportunity of skill acquisition more unequal.

***JEL classification:*** I23, I24, J64, E32

***Keywords:*** unemployment, school enrollment, return to education, youth, Great Recession, EU-SILC

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# 1 Introduction

The Great Recession has hit particularly hard young people across Europe (Bell and Blanchflower, 2011). According to data from Eurostat, the unemployment rate for those below 25 years of age reached 23.7% in the European Union (28 countries) in 2013 while the corresponding figure for those older than 24 was 9.5%. In countries as Spain or Greece, every second young person that was looking for a job that same year could not find it, being the youth unemployment rate of 55.5% and 58.3%, respectively. Undoubtedly, such levels of joblessness and overall employment insecurity have important consequences in young people lives in multiple domains: possibilities for residential emancipation (Becker et al., 2010; Matsudaira, 2016); decisions on marriage (De la Rica, 2005), fertility and family formation (Del Bono et al., 2012, 2015), income mobility (Cantó and Ruiz, 2015), etc.

A poor economy can also affect young people’s decisions on investment in education. It is reasonable to expect that when young people observe that there are fewer jobs available (and perhaps more precarious working conditions), pursuing further education can be thought of as a good alternative to joblessness or bad career prospects. The opportunity cost of education is lower when the unemployment rate is high so remaining in education or returning to school could be more likely during an economic downturn than in a growing economy (Becker, 1975, Heylen and Pozzi, 2007). Naturally, uncertainty about the future can drive school retention and transitions back to education (Canton, 2002).

On the opposite, it is also true that when the economy enters a recession and governments are forced to implement austerity measures, educational budgets can suffer important cutbacks jeopardizing young people’s chances to remain or return to education — either because of increased tuition fees, a reduced number of scholarships or more expensive student loans (Kane, 1994; Dellas and Sakellaris, 2003).<sup>1</sup> By the same token, in those contexts where non-compulsory education is not fully subsidised, a decline in individual and family income during recession years, may also prevent young people from remaining or returning to education because of an increased “inability-to-pay” (Christian, 2007; Méndez and Sepúlveda, 2012; Sakellaris and Spilimbergo, 2000). A smaller availability of part-time jobs to conciliate with studying may also yield enrollment more difficult during bad economic years (Dellas and Sakellaris, 2003).

The main objective of this paper is to assess to what extent the high levels of joblessness and job insecurity brought by the Great Recession across Europe have translated into a higher probability of educational enrollment, returns to education and school retention among young people. Has the diminished opportunity cost of studying dominated the increased difficulties of educational enrollment brought by austerity measures and declining income? If this is the case, our results will find a positive association between increasing unemployment rates and the probability that young people are enrolled. Instead, if the (in)ability-to-pay effect dominates, a negative association between unemployment and school enrollment will be found.

Empirical evidence on the effect of crises on schooling decisions is scant (particularly

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<sup>1</sup>Examples of cutbacks in education are multiple across Europe in the context of the Great Recession. According to the European University Association, public spending in higher education decreased more than 40% in Greece between 2008 and 2014; between 20 and 40% in Ireland, Lithuania and the United Kingdom; and in between 10% and 20% in the Czech Republic, Spain, Iceland and Italy (see Public Funding Observatory, 2016). As for tuition fees, possibly, the most extreme case during the period can be found in the United Kingdom where fees tripled in 2012.

in the case of Europe) and ambiguous (mostly based on single country case studies). The majority of papers find a counter-cyclical relationship by which when the economy enters a period of recession (and the unemployment rate raises), school attendance and enrollment increases (see, among others, Alessandrini et al., 2015; Long, 2015; Méndez and Sepúlveda, 2012; Heylen and Pozzi, 2007; Dellas and Sakellaris, 2003; Dellas and Koubi, 2003; Mattila, 1985; and references there in). Fewer studies find a pro-cyclical relationship (King and Sweetman, 2002; Rucci, 2003; Edwards, 1976) and yet another group of papers find no association at all (Kane, 1994; Polzin, 1984).<sup>2</sup> So it is unclear at this point, what to expect in the context of the Great Recession in Europe.

This paper contributes to the literature in several important ways. First, to the best of our knowledge, this is the first paper to study educational enrollment in the context of the Great Recession for a total of 28 European countries (and over 170 regions) — being the only exception a brief analysis by Vandenberghe (2010) (commented below). Second, this is the first analysis not solely based on cross-sectional data or on longitudinal data but our findings are based on both. This way, we do not only study the association between bad economic conditions and total enrollment, we also try to understand which group (those remaining or those returning to education) drives the overall trend. This allows us to draw new results in the literature as to what extent the effect of cyclical fluctuations on human capital decisions is persistent or transitory in the context of Europe. Finally, our in-depth analysis by individual and household characteristics allows us to unfold the great heterogeneity by subgroup behind the overall trend.

Our analysis is based on the European Union - Statistics on Income and Living Conditions (EU-SILC) for the period between 2004 and 2014 in the case of the cross-sectional data and, between 2004 and 2013 as for the longitudinal component. We have matched the EU-SILC with data from Eurostat on the population and youth unemployment rates (both at the country and at the regional level). Given that the Great Recession has impacted very differently in the European countries and regions, we can exploit the large variability of unemployment rates across time and territory to identify a change in the decision to enroll, return or remain in education by European youth. All our results are the outcome of fixed-effects logit regressions with clustered standard errors.

Our main findings are consistent with the literature documenting that schooling decisions are counter-cyclical. Specifically, we find that a 1 percentage point increase in the unemployment rate can be associated with between 0.28 and 0.42 percentage points increase in the probability of being enrolled in education. In the case of returns to education, the same figures are 0.12-0.16 and we get 0.20-0.31 in the case of school retention. Our results are robust to different standard errors adjustments, specifications and sample of countries included. The analysis by demographic subgroups indicates that young males, those younger than 25, those without a college degree and those who were previously employed tend to react more to changes in the labor market conditions. More importantly, we find that household income is a very strong determinant of schooling decisions during the period by which those in the lower part of the income distribution are not as likely to enroll in education as their richer counterparts. Indeed, when breaking the results by educational level, we even find a negative association between rising unemployment rates and enrollment at the University for those in the poorest income quartile.

Our results have positive and negative implications. On the good side, the Great Recession meant that young Europeans acquired more education which, in the future, can translate in higher economic productivity, lower wage inequality and better career

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<sup>2</sup>We review this literature in more detail in the next section.

prospects. Also, with the decision to enroll, return or remain in education, young people can avoid unemployment scarring (Arulampalam et al., 2000, 2001) and the future consequences of it. On the negative side, our results show that the Great Recession made the possibility to enroll in education more unequal than before as students from more disadvantaged economic backgrounds are less likely to enroll in University studies in response to rising unemployment rates. Moreover, in contexts where over-education is a problem and, graduates perform tasks that are below their qualifications, acquiring more education may not pay-off and the accumulation of human capital may not produce the expected returns. Indeed a recent study by McGuinness et al. (2015) shows that over-education is more important in some of the peripheral countries hardest hit by the Great Recession in Europe where, moreover, youth over-education tends to be more important than adult over-education.

After this introduction, the paper continues as follows. Next section reviews the literature on the influence of the business cycle on human capital investment decisions. Section 3 presents the datasets used, defines our dependent variables and details our controls. Section 3 introduces the methodology and the econometric technique used throughout the paper. Section 4 shows our main results and gives account of a series of robustness checks. And, finally, the conclusions summarise our findings and discuss some policy recommendations of our results.

## 2 Literature review

The literature on the influence of the business cycle on decisions to return to education is scant, particularly in the case of Europe (Vandenbergh, 2010). Most of the theoretical papers about the cyclicity of schooling find a positive relationship between economic growth and human capital accumulation (Becker, 1975; DeJong and Ingram, 2001; Delmas and Sakellaris, 2003). However, the empirical literature is much more diverse and ambiguous, mostly based on country case studies.

The great majority of analyses (devoted to the United States) find a counter-cyclical relationship: school attendance and enrollment declines as the economy grows while the number of students increases when the unemployment rate rises. The recent study by Long (2015), and the closest to our work, assesses the impact of the Great Recession on college enrollment in the United States and finds that attendance level increased during the recession particularly in those States most affected by the economic downturn (measured by State unemployment rates and an indicator for change in home values).<sup>3</sup> However, she finds that the trend is driven by part-time enrollment since full-time enrollment actually declines. Moreover, the author finds that the trend favoured particularly minority students while white students actually reduced their enrollment in those states most affected by the crisis. Finally, Long (2015) shows that the number of less-than-one-year certificates increased and suggests that this may be related with an increased likelihood of upper-level students being more likely to stay to finish their degrees after the recession. Barr and Turner (2014), also referring to the period of the Great Recession, find a similar counter-cyclical trend but they attribute it to an increase in the availability of financial aid and the extensions in unemployment insurance benefits.

Furthermore, Alessandrini et al. (2015) based on data from the United States for the period 1986-2012 find that a one percent increase of GDP above its trend increases young

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<sup>3</sup>It has been shown for the US that many families rely on home equity to finance college.

people’s probability of post-secondary enrollment by 1.37 percentage points. Moreover, in an analysis by subgroups, the authors show that low-skilled individuals (*proxied* by parental education) are more responsive to macroeconomic conditions. In turn, Méndez and Sepúlveda (2012) study not only schooling episodes but also training using quarterly data from the National Longitudinal Survey of Youth (NLSY79) for a period of 19 years. They find that aggregate schooling and time devoted to schooling in the United States are clearly counter-cyclical while training is pro-cyclical (mainly because firm-financed training is so). Only self-financed training is found to be counter-cyclical. In subgroup analyses, they conclude that skill acquisition investment also depends on the educational level and the employment status of the individual —being the increased probability of enrollment higher for the unskilled.

Continuing on evidence from the United States, Dellas and Sakellaris (2003) find once more a counter-cyclical relationship: a one percentage point increase in the unemployment rate is associated with a 2% increase in college enrollment among 18 to 22 year old high school graduates for the period between 1968 and 1988. Importantly, the authors indicate that “youths that substitute away from college education in a boom year are less likely to go to college later on when economic activity falls. The increase in college enrollment during a subsequent recession seems to come from increased participation of new cohorts of high school graduates” (Dellas and Sakellaris, 2003: 164). Thus establishing a persistent effect of cyclical fluctuations in enrollment decisions.<sup>4</sup> In a similar fashion, Dellas and Koubi (2003) study the schooling behaviour of different age groups and find a general counter-cyclical trend — being stronger for teenagers and those in the age group between 25 and 29. They also show that expected real interest rate is negatively associated with enrollment but there is no evidence for a link with other credit market variables.

There are other studies with similar evidence for the United States. DeJong and Ingram (2001) estimate a business cycle model in which a representative individual allocates time among skill acquisition, leisure and labour. Using data from 1948 to 1995 to estimate the parameters of the model, they find that skill acquisition is counter-cyclical: the correlation with output is -0.36. Betts and McFarland (1995) with information from the 60s up to mid 80s find that a 1% increase in the unemployment rate of recent college graduates is associated with a rise of 0.5% full-time college attendance. When considering the unemployment rate of all adults, the same effect rises to 4%. Mattila (1982) shows that school enrollment between 1956 and 1979 increased during recessions among young males (but not older ones) result that he interprets as evidence of a ‘discouragement effect’.<sup>5</sup>

As for evidence outside the United States<sup>6</sup>, we can highlight the work by Heylen and Pozzi (2007) who find a positive relationship between economic crises (measured by

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<sup>4</sup>As we will see below, our results for Europe in the context of the Great Recession differ from those by Dellas and Sakellaris (2003) as we find that decisions to leave education are not persistent over time.

<sup>5</sup>Card and Lemieux (2001) also find a counter-cyclical relationship in the US to explain enrollment trends in the 70s but the size of the effect is weak and depends on age.

<sup>6</sup>Part of the literature has been devoted to the analysis of low and middle-income countries but in this case the analyses usually refer to children at school age. For example, Schady (2004) finds no effect on attendance rates of the macroeconomic crisis that Peru suffered between 1988 and 1992 but they do find higher mean educational attainment. Skoufias and Parker (2006) show that the 1995 peso crisis in Mexico had no effect on school attendance of teenage boys (12 to 19 years of age) but a negative effect on teenage girls. However, lower attendance among girls did not seem to impede advancement to the next grade. The authors use the event of unemployment of the household head as a proxy of the economic conditions. Finally, Rucci (2003) provides evidence for Argentina during the crisis of 1998-2002. The author finds that the 55% real household income decline can be associated with a reduction in the probability of attending school of 4.7-12% for 12 to 17 years olds.

large increases in the inflation rate) and schooling (measured by a change in the average number of years of schooling for the population of age 15 between  $t$  and  $t - 5$ ) in a macro-data panel of 86 countries between 1970-2000. They find that a crisis translates in average into 0.3 more years of schooling and that the crisis does not need to be extreme to translate into more human capital accumulation. The authors also find a positive effect of government spending on schooling. Moreover, Sakellaris and Spilimbergo (2000) study the relationship between tertiary education enrollment and economic fluctuations for a large number of countries during the period from 1962 to 1992. They focus on foreign students who enrol in US universities and find a strong correlation between enrollment and the business cycle in the sending countries. However, the direction differs depending on the level of development of the country of origin: while enrollment for those coming from a OECD country is counter-cyclical, it is pro-cyclical for those from a non-OECD country.<sup>7</sup> To the best of our knowledge, there are no studies exclusively based on Europe that would show a counter-cyclical relationship of schooling and economic conditions as we do.

Few papers have found a pro-cyclical relationship between schooling and business cycle fluctuations. King and Sweetman (2002) focus on the group of individuals over 25 years of age that have been working for at least 20 weeks and decide to return to education (in what they label as “retooling”). Using administrative data from Canada between 1979 and 1993, they find that transitions back to education move in the opposite direction than the unemployment rate and in the same direction with a “help-wanted index” and the natural logs of GDP and investment. The authors conclude that during booming years, workers have more incentives to leave their low productivity jobs to gain access to higher-paying occupations in the future. In a similar vein, Edwards (1976), also finds a pro-cyclical response of school enrollment and retention to changes in the business conditions among teenage girls during the postwar period in the United States. On the contrary, the same effect is not found among boys (except for non-white males that behave counter-cyclically). The difference is attributed to a lesser degree of variation in the opportunity costs of enrollment among teenage girls.

Finally, a small number of papers have found no association between the business cycle and schooling. The only one based on Europe that we have found is by Vandenberghe (2010). Using data from the EU-SILC (as in the current paper) for 2006 and 2007, the author analyses whether final educational attainment is influenced by the labour market conditions that young people observed when they were 17. His identification strategy is based on first-difference models that capture the impact across quasi-cohorts on educational attainment trends of changing unemployment rates. He does not find any statistically significant correlation between changing labour market conditions at age 17 and subsequent educational attainment. However, note that his results are based on only one year of data. Similarly, Kane (1994) finds that State unemployment rates are not related with individual enrollment neither for whites nor blacks in the United States through the 70s and 80s. Rather he finds that changes in tuition fees and increasing average parental education explain the trends. Finally, Polzin (1984) in his analysis of University enrollment in the State of Montana in the beginning of the 80s finds that short-term economic conditions do not influence the decision to enroll in higher education

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<sup>7</sup>This different behaviour seems to be explained by institutional differences in the financial and educational system and in the labour market (those in OECD face less credit constraints and higher returns to education) rather than by differences in the level or inequality of income (as proxies to ability-to-pay) between these groups of countries.



but they do in the type of college that is chosen.

### 3 Data

We use data from all the waves available of the European Union - Statistics on Income and Living Conditions (EU-SILC) in its cross-sectional and longitudinal form. The EU-SILC has several advantages for the purpose of our analysis: (i) it provides detailed information on individuals and households socio-economic and demographic characteristics, (ii) it allows a comparative analysis across Europe with evidence for 28 countries and, (iii) it covers a sufficiently large period of time: the years previous to the bust of the Great Recession (2004-2007), the time when countries were hit hardest by the economic downturn (2008-2011) and the years after (up to 2014 for the cross-sectional data and 2013 for the longitudinal). On the opposite, one of the disadvantages of the longitudinal component is that individuals are only traced for four consecutive waves. This implies that in each wave, 25% of the sample is replaced by a new rotational group so, for example, we can only observe a possible transition back to education in three occasions for each individual. Necessarily, if a transition to education occurs outside our observational window, we cannot account for it.<sup>8</sup> In a similar vein, the EU-SILC has been questioned for not tracing well young people leaving parental home in a number of countries (Iacovou and Lynn, 2013). Thus, if transitions back to education occur simultaneously with residential emancipation, our results could be biased.<sup>9</sup>

While the cross-sectional component of the EU-SILC poses no problem, in the case of the longitudinal component, researchers need to make a choice as for the way that the pooled dataset is constructed in order to avoid the duplication of households (Iacovou and Lynn, 2013). In our case, for each rotational group, we take the information available from the last wave each individual participates in the panel. This way not only observations are not duplicated, we also make sure that if there was a change between years in the way information is collected, our individual observations are not affected by this.

Our sample includes young people aged 16 to 29. In the case of the cross-sectional data, an individual is considered to be enrolled in education if he declares that his/her current economic status is being a student. In the longitudinal data, and regarding transitions back to education, we consider all young people that at  $t - 1$  were employed, unemployed or inactive who can potentially make a transition to education at  $t$ . Thus, we exclude individuals that are students at  $t - 1$  and individuals with missing information on their labour market status at  $t - 1$  or at  $t$ . By the same token, we consider that an individual is retained in the educational system if at  $t - 1$  was a student and declares to be still studying at  $t$ . Again, we disregard individuals with missing information in one of the two years.

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<sup>8</sup>Notwithstanding this, it is important to take into account that the EU-SILC is the dataset that has allowed the identification of the greatest number of transitions back to education compared to, for example, the Labour Force Survey which contains a variable that allows to identify a change of status in the labour market in comparison to the previous year. However, the fact that information is collected for only one possible transition reduces strongly the chances of observing a return to education for a given individual.

<sup>9</sup>To make sure that our findings are not driven by the EU-SILC survey design and its tracing rules, we have run our main specification on transitions back to education (see the first panel in Table 5) with those countries identified to best follow young people (namely, Spain, Portugal, Italy, France and Cyprus) and our qualitative findings remained unchanged (though the level of significance decreased due to the low number of observations).

We draw results for all the countries that are available in both components of the dataset with the only exception of Croatia because it joined the project only in 2010 and therefore the number of available waves was considered insufficient. As mentioned, the period under analysis is from 2004 to 2013/14 but note that few countries joined the EU-SILC project later on. Table A.1 in the Appendix provides detailed information of the period covered in each country by the longitudinal dataset.<sup>10</sup> The sample contains 965,134 observations in the case of the cross-sectional data and 208,595 as for the longitudinal component.

Finally, Table 1 summarises some of the most important characteristics of our sample.<sup>11</sup> As for the dependent variables, 39.8% of individuals declare to be students, about 4.7% of young people engage in a transition from employment, unemployment or inactivity to education during the period while 78.5% are school retained.<sup>12</sup> Moreover, 47% of the sample are females and the average age is 25.1. Nearly 45% of the young people in the sample live with at least one of their progenitors while 33% cohabit with a partner. About 20% of the sample live with their own children. As for young people's educational level, 52.4% hold a high-school degree and 25.4% a University degree. The rest of the sample did not graduate from secondary education. Furthermore, 23.9% live in a household with an equivalent income placed in the first quartile while those in the fourth quartile represent 23.5%.<sup>13</sup> The great majority of young people however live in a household with an income in the third quartile of the distribution. The sample is largest for 2009 and 2010 as it is the time when most rotational groups and countries participate in the panel.

## 4 Methodology

With the objective of understanding the possible relationship between changes in the labour market (measured by the unemployment rate) and young people's decisions to return to education, we have merged the built datasets with information from Eurostat on the unemployment rates in the different countries and regions. As the Great Recession has had a very diverse impact in the different countries and regions of Europe, we can exploit such variability to capture the relationship between changes in the unemployment rate and (transitions to) education.

Figure 1 shows by means of a box plot the great variability of the incidence of the population unemployment rate across the 28 countries analysed.<sup>14</sup> As can be seen, the unemployment rate varies from as low as 2.3% in Iceland (for 2007) to as high as 27.5% in Greece (for 2013). Note also that while some countries have an unemployment rate

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<sup>10</sup>As a robustness check, we have run our main regressions with the countries that participate continuously from 2004 or 2005 to 2013 and our main findings do not change.

<sup>11</sup>We detail the summary statistics of the longitudinal component but those of the cross-sectional file are similar.

<sup>12</sup>As noted by King and Sweetman (2002), the number of individuals that decide to return to education may seem small, however, cumulatively, they represent an important part of the workforce.

<sup>13</sup>Household income is made equivalent by using the modified OECD equivalence scale that gives a weight of 1 for the first adult, 0.5 for the rest of adult members in the household and 0.3 for children under the age of 14. Note that equivalent income quartiles do not necessarily contain 25% of the observations in our sample as quartiles have been computed for the whole income distribution in each country and per year.

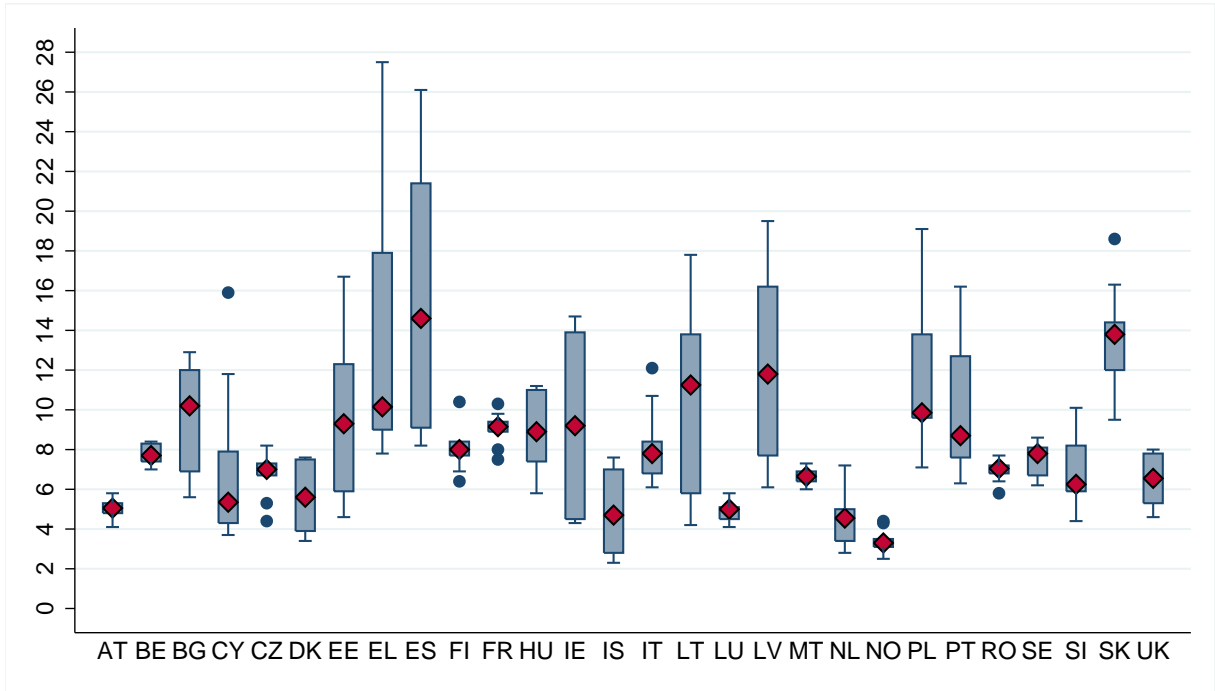
<sup>14</sup>Recall that in a whisker plot the adjacent line shows the lower and upper values while the box contains the values between the 25th and 75th percentile. The circles are outside values and the diamonds indicate the median.

**Table 1:** Summary statistics

Variable	Mean	Std. Dev.	Min.	Max.
Enrolled in education (*)	0.397	0.489	0	1
Back to education	0.047	0.211	0	1
School retained	0.785	0.411	0	1
Female	0.472	0.499	0	1
Age	25.183	2.956	16	29
Age squared	642.913	144.54	256	841
Living with parents	0.446	0.497	0	1
Living with a partner	0.335	0.472	0	1
Has own children	0.207	0.405	0	1
High-school drop-out	0.222	0.416	0	1
High-school graduate	0.524	0.499	0	1
University degree	0.254	0.435	0	1
Hh. equivalent income (1st. quartile)	0.239	0.426	0	1
Hh. equivalent income (2nd. quartile)	0.246	0.431	0	1
Hh. equivalent income (3rd. quartile)	0.280	0.449	0	1
Hh. equivalent income (4th. quartile)	0.235	0.424	0	1
2005	0.064	0.245	0	1
2006	0.107	0.309	0	1
2007	0.111	0.315	0	1
2008	0.121	0.326	0	1
2009	0.121	0.326	0	1
2010	0.126	0.332	0	1
2011	0.126	0.332	0	1
2012	0.116	0.32	0	1
2013	0.107	0.309	0	1

Source: Authors' computation on the EU-SILC, longitudinal files (2005-2013). Weighted results. (\*) indicates result drawn from the cross-sectional component.

**Figure 1:** Box plots for the unemployment rate at country level, 28 European countries, 2004–2013



Source: Labour Force Survey, Eurostat.

that varies within a relatively small range (see, for example, Luxembourg, Norway or Romania), others experience a dramatic change with large differences between the minimum and maximum values of the period (see Spain, Greece, Ireland or Lithuania). For completeness, Figure A.1 in the Appendix shows the unemployment rate trends by country. We confirm our results by using the unemployment rate at regional level and also the youth unemployment rate (both at country and at regional level). In both cases, the variability is even larger. When working with data at the regional level, we use information at NUTS (*Nomenclature of Territorial Units for Statistics*) 1 or 2 depending on the information available in the EU-SILC and we can count on more than 170 regions.

Our results are based on fixed-effects logit models which we specify as follows:

$$Y_{ict} = \alpha + X_{ict}\beta + Unempl_{ct}\gamma + C_c + T_t + \epsilon_{ict} \quad (1)$$

where subscript  $i$  is for individuals,  $c$  is for country (or  $r$ , in the case of regions) and  $t$  for time.  $Y_{ict}$  represents the outcome of interest, young people's decision to enroll, return or be continuously engaged in education.  $X_{ict}$  is a vector of control variables that includes gender, age, age squared, living with at least one parent, living with a partner and having own children.  $\gamma$  is the parameter of main interest as it captures the relationship between changes in the unemployment rate and changes in education attendance.  $\epsilon_{ict}$  is the usual error term.

Importantly, we control for country (or region) and time fixed-effects,  $C_c$  and  $T_t$ , respectively. Country fixed-effects account for characteristics that are specific of a given

country—for example, cultural factors towards further education. In turn, time fixed-effects control for possible shocks that occur at a point in time throughout Europe—for example, a change in the rules for exchange students within the Erasmus+ programme.<sup>15</sup> All the regressions are weighted and clustered standard errors either at country or at regional level are used throughout the paper.

## 5 Results

We present the results in three subsections. First, we use cross-sectional data to investigate the relationship between total enrollment in education and changes in the unemployment rate. Specifically, we test whether bad labour market conditions during the Great Recession led more young people to enrol in education. Second, we take advantage of the longitudinal component of the EU-SILC data and investigate whether some young people—who may have substituted education in the booming years—decide to return to the educational system when labour market conditions worsened. Finally, we finish the analysis with a brief section on school retention.

In all cases, we first present our preferred specification which uses the population unemployment rate as a measure of change in the labour market—though we also detail results for youth unemployment. Arkes (2007) argues in favour of using a population unemployment rate because potential sampling error may be less important. As he says, the use of a youth unemployment rate could introduce some endogeneity. Instead, such effect is likely to have a minimal impact on the population rate. On the other hand, though, it can be argued that young people are more likely to make decisions on remaining in education or returning to education while observing their age group opportunities in the labour market and not those of all the adult population. Therefore, in a second analysis we run our main regressions using the youth unemployment rate instead of the population unemployment rate. We also check whether our findings are robust to alternative specifications, different standard errors adjustments and sample selection. Finally, we carry out a subgroup analysis to explore whether the business cycle affects differently the human capital accumulation decisions of youths with different characteristics.

### 5.1 Enrollment in education

#### *Main Results*

Table 2 displays the results for the unemployment rate coefficient from estimating equation 1 using the population unemployment rate at country and at regional level. The dependent variable is an indicator variable which takes value one if the individual is currently studying and zero otherwise. First, we present the raw estimates; then we add individual characteristics (gender, age, age squared, living with at least one parent, living with a partner and having own children) and, finally, we add dummy variables indicating whether the individual’s household income is in the first (omitted), second, third or fourth quartile of the income distribution by country and wave. In Panel A, we

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<sup>15</sup>Note that it is particularly important to control for year fixed-effects (or a linear trend for time) because enrollment has generally increased during the last decades and was likely to increase regardless of the economic downturn. So we need to control for this upward trend to capture the effects of the Great Recession beyond the annual growth rate of enrollment.

use the current unemployment rate.<sup>16</sup> Alternatively, Panel B and C present the results using the unemployment rate lagged one and two years, respectively.

**Table 2:** Main results: Total enrollment and unemployment rate

	At country level			At regional level		
	Raw	+ Individual characteristics	+ Family income	Raw	+ Individual characteristics	+ Family income
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A</b>						
UR (t)	0.0178*** (0.0058)	0.0175** (0.0081)	0.0169** (0.0078)	0.0152*** (0.0032)	0.0161*** (0.0042)	0.0157*** (0.0042)
Marginal effect	0.0042*** (0.0014)	0.0032** (0.0015)	0.0031** (0.0014)	0.0036*** (0.0008)	0.0029*** (0.0008)	0.0028*** (0.0007)
<b>Panel B</b>						
UR (t-1)	0.0173*** (0.0060)	0.0165** (0.0083)	0.0161** (0.0081)	0.0149*** (0.0032)	0.0152*** (0.0042)	0.0149*** (0.0042)
Marginal effect	0.0041*** (0.0014)	0.0030** (0.0015)	0.0030** (0.0015)	0.0035*** (0.0008)	0.0027*** (0.0008)	0.0027*** (0.0007)
<b>Panel C</b>						
UR (t-2)	0.0192*** (0.0064)	0.0180** (0.0086)	0.0176** (0.0085)	0.0179*** (0.0031)	0.0173*** (0.0041)	0.0171*** (0.0040)
Marginal effect	0.0045*** (0.0015)	0.0033** (0.0016)	0.0032** (0.0016)	0.0042*** (0.0007)	0.0031*** (0.0007)	0.0031*** (0.0007)
Observations	969,539	969,315	968,610	746,113	746,040	745,342
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Results from estimating equation 1 using the pooled EU-SILC cross-sectional microdata from 2004 to 2014. Sample: Youth 16-29 years old. Individual controls include: sex, age, age squared, an indicator variable of whether the individual has a partner, an indicator variable of whether the individual lives with parents and an indicator variable of whether the individual has children. Household income is captured in a set of dummies indicating whether the individual is in the second, third or fourth quartile of the income distribution (the first one is omitted). Standard errors are clustered at country (regional) level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

The results in Table 2 indicate a positive relationship between the level of unemployment in a given country or region and enrollment in education. Given that we control for country and year fixed-effects, the relationship is net of other possible circumstances that may affect a particular country and other common shocks that may affect all the countries in our sample. As can be seen in Panel A, after controlling for individual characteristics and family income, we find that a 1 percentage point increase in the current population unemployment rate at the country level, is associated with a 0.31 percentage points increase in the proportion of young people who are currently studying. Panels B and C show that the marginal effects are almost the same when considering the lagged unemployment rate either at  $t - 1$  or at  $t - 2$ .

The results are also quite similar when exploiting regional variation in the unemployment rates. In this case, the effect varies from 0.28 to 0.31 percentage points depending on the point in time that the unemployment rate is considered. In Appendix Table A.3 we show that our findings are robust to the unemployment measure chosen, to different

<sup>16</sup>Table A.2 in the Appendix shows all the coefficients of the control variables included in the main regression (Panel A in Table 2).

standard errors adjustments and specifications and also to the sample of countries under analysis. First, we consider the youth instead of the population unemployment rate and again we find a positive relationship but the effect is slightly smaller.<sup>17</sup> Second, we show the results when clustering the standard errors at year and at country (regional) level simultaneously. In Panels C and D we include a general linear trend and country-specific linear trends, respectively, in addition to control for year fixed effects. In panel E, we run our main regressions with the countries that participate continuously from 2004 or 2005 to 2014. All these robustness checks support our main results.

Given that individuals are asked about the level of education in which they are enrolled, next we investigate whether the increase in the total enrollment during the Great Recession is driven by those youths enrolled in tertiary education or by those attending either a high school or a vocational programme. To this end, we estimate equation 1 using two alternative dependent variables: first, the dependent variable takes the value one if the individual is enrolled in a high school or in a vocational programme and zero otherwise and, second, the dependent variable takes the value one if the individual is currently attending a tertiary level programme and zero otherwise. The results are displayed in Table 3. As can be seen, in both cases the relationship between education attendance and the unemployment rate is positive. However, while the effect of the unemployment rate on the likelihood of being enrolled in a High School or a vocational programme is always statistically significant at 1%, the effect on the likelihood to being enrolled in a tertiary education programme is substantively lower and even not statistically significant when we carry out the analysis at regional level.

In summary, our results suggest that as a consequence of bad labour market conditions during the period of the Great Recession, more young Europeans decided to enrol in education —being particularly the case for those at the level of non-compulsory secondary education. This finding is consistent with the literature documenting that schooling decisions are counter-cyclical (Alessandrini et al., 2015; Méndez and Sepúlveda 2012; Heylen and Pozzi 2007; Dellas and Sakellaris 2003; DeJong and Ingram 2001; Betts and McFarland 1995). However, our estimates for Europe are substantially lower than the estimates for the United States. Specifically, among the studies which also use the unemployment rate as a proxy of the business cycle, Méndez and Sepúlveda (2012) find that a one percentage point increase in the unemployment rate is associated with an increase between 0.6 and 0.9 percentage points in the likelihood of being in formal education, Dellas and Sakellaris (2003) document a 0.8 percentage points increase in college enrollment and Betts and McFarland (1995) estimate a rise of 0.5 percentage points in full-time college attendance.

In addition, while the studies from the United States find robust evidence about the counter-cyclicity of enrollment at the University level, the evidence we present is less robust in the case of Europe. One possible explanation is that the cost of tertiary studies along with credit constrains during the period of economic downturn have prevented some young people from enrolling in University’s programmes. In the next section, we carry out the analysis by socio-demographic characteristics and look for possible evidence of this hypothesis.

### *Subgroup analysis*

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<sup>17</sup>In this regard, it is important to take into account that youth unemployment rates increased significantly more than the population unemployment rate during the Great Recession.

**Table 3:** Total enrollment and unemployment rate by educational level

	At country level			At regional level		
	Raw	+ Individual characteristics	+ Family income	Raw	+ Individual characteristics	+ Family income
	(1)	(2)	(3)	(4)	(5)	(6)
<b>A. Enrollment in High School or vocational programme</b>						
UR (t)	0.0211*** (0.0070)	0.0171** (0.0080)	0.0169** (0.0079)	0.0182*** (0.0030)	0.0176*** (0.0036)	0.0174*** (0.0036)
Marginal effect	0.0032*** (0.0010)	0.0019** (0.0009)	0.0019** (0.0009)	0.0027*** (0.0004)	0.0019*** (0.0004)	0.0019*** (0.0004)
<b>B. Enrollment in tertiary level education</b>						
UR (t)	0.0061** (0.0028)	0.0092** (0.0037)	0.0088** (0.0035)	0.0054 (0.0034)	0.0065 (0.0041)	0.0064 (0.0040)
Marginal effect	0.0010** (0.0004)	0.0012** (0.0005)	0.0012** (0.0005)	0.0008 (0.0005)	0.0009 (0.0005)	0.0009 (0.0005)
Observations	965,134	964,910	964,207	743,875	743,802	743,106
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Results from estimating equation 1 using the pooled EU-SILC cross-sectional microdata from 2004 to 2014. Sample: Youth 16-29 years old. Individual controls include: sex, age, age squared, an indicator variable of whether the individual has a partner, an indicator variable of whether the individual lives with parents and an indicator variable of whether the individual has children. Family income is a set of dummies indicating whether the individual is in the second, third or fourth quartile of the income distribution (the first one is omitted). Standard errors are clustered at country (regional) level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

In this section, we explore whether the unemployment rate affected in a different way the schooling decisions of different socio-demographic and economic groups. This analysis may reveal whether the balance between “opportunity costs” and “ability-to-pay” for education leads to different behaviours across groups. This is relevant because as Méndez and Sepúlveda (2012) point out *“while it could be optimal for many individuals to engage in counter-cyclical skill acquisition, the inability to obtain financing in recessions may distort this decision toward acquiring skills procyclically”* (Méndez and Sepúlveda, 2012: 149). The results are shown in Table 4. We carry out the analysis by gender, age, and quartiles of income. Panel 1 presents the results for the likelihood of being enrolled in education (regardless of the level), whereas Panel 2 and 3 present the results for the likelihood of being enrolled in High School or a vocational programme, and the likelihood of being enrolled in tertiary education, respectively.

As can be seen in Panel 1.A, labour market conditions seem to have more influence on male than female schooling decisions. The marginal effect of a 1 percentage point of the unemployment rate is higher (and estimated with more precision) for men than for women (0.3 versus 0.2 percentage points). This pattern is observed in both educational levels (see Panels 2.A and 3.A). Given that women already face worse labour market conditions than men, it is possible that they were less affected by the Great Recession. Indeed, while the average male unemployment rate for the EU countries increased 4.2 percentage points during the Great Recession (from 6.6% in 2008 to 10.8% in 2013), the female unemployment rate increased 3.4 percentage points, from 7.5% in 2008 to 10.9% in 2013 according to data from Eurostat. Additionally, it could also be that since girls are more likely to participate in non-compulsory education than boys, the former take their



schooling decisions somehow more independently of the economic environment.

When we divide the sample in two groups depending on whether the individuals are younger (older) than the median, we find that the positive effect between the unemployment rate and enrollment is driven by the youngest group (see Panels 1.B, 2.B and 3.B of Table 4). For every 1 percentage point increase in the unemployment rate, the probability that a young person between 16 and 23 years old is enrolled in education increases 0.38 percentage points, while the increase in the probability for those older than 23 is less than half of it (between 0.14 and 0.18 percentage points). This result could suggest that the effect on the total enrollment is mostly driven by new cohorts rather than the return to education of those who substituted away education during the booming years. In the next section, we explore with more detail whether some young Europeans actually decided to come back to education motivated by the rise in the unemployment rate during the Great Recession.

Finally, Panels 1.C, 2.C and 3.C show the results by quartiles of the equivalent household income. An interesting pattern emerges from this analysis. First, the labour market conditions do not affect the schooling decisions of those in the first quartile of the income distribution. When focusing on the total enrollment of those in the second quartile and above, the richer the household, the higher the effect of the unemployment rate on decisions to enrol in education. Méndez and Sepúlveda (2012) also find a stronger counter-cyclical behaviour of skill acquisition for wealthier people in the United States, but only for those engaged in training activities.

Panels 2.C and 3.C show that this pattern differs depending on the level of education in which the individual is enrolled. Indeed, as can be seen in Panel 2.C, the rise in the unemployment rate has a higher effect on the likelihood of being enrolled in High School or vocational programmes for those in the middle of the income distribution. The marginal effect of a 1 percentage point increase in the unemployment rate drops from 0.30 percentage points for those in the second quartile of the income distribution to 0.10 for those in the fourth quartile. Finally, Panel 3.C shows that the relationship between the labour market conditions and the likelihood of being enrolled in tertiary education programme is strongly affected by the individual's household income. The results even suggest a negative relationship between the unemployment rate and the likelihood of being enrolled in tertiary education for the poorest group (those belonging to the first quartile); for whom the schooling decision is pro-cyclical. These results support the hypothesis that the rising cost of tertiary level education along with more credit constrains during the Great Recession seems to have distorted the decision of skill acquisition for some groups of individuals, jeopardising the opportunities of those with less economic resources.

## 5.2 Back to education

### *Main Results*

In order to gain a more nuanced understanding of the overall trend of rising education enrollment along with growing unemployment rates, in this section, we disaggregate the analysis by focusing on a group of young individuals: those that had left education at a point in time, were employed, unemployed or inactive, and decide to return to education because of the bad macroeconomic conditions. In this respect, we try to disentangle whether the results presented in the previous section are mostly driven by new cohorts (as suggested by the cross-sectional results) or rather it is young people that decide to transit

**Table 4:** Total enrollment and unemployment rate - Subgroup analysis

	At country level			At regional level		
	UR(t)	Marginal effect	N	UR(t)	Marginal effect	N
<b>1. TOTAL enrollment</b>						
A) By gender						
Males	0.0207** (0.0093)	0.0040** (0.0018)	530,766	0.0189*** (0.0047)	0.0036*** (0.0009)	408,859
Females	0.0124* (0.0063)	0.0019** (0.0010)	437,844	0.0124*** (0.0047)	0.0019*** (0.0007)	336,483
B) By age						
23 or younger	0.0192* (0.0103)	0.0038* (0.0020)	592,966	0.0196*** (0.0053)	0.0038*** (0.0010)	457,695
Older 23	0.0138** (0.0069)	0.0018** (0.0009)	375,644	0.0105*** (0.0038)	0.0014*** (0.0005)	287,593
C) By income						
Q1	-0.0020 (0.0058)	-0.0004 (0.0011)	254,350	-0.0022 (0.0063)	-0.0004 (0.0012)	203,469
Q2	0.0228** (0.0092)	0.0042** (0.0017)	242,232	0.0205*** (0.0057)	0.0037*** (0.0010)	185,641
Q3	0.0279*** (0.0099)	0.0048*** (0.0017)	250,760	0.0272*** (0.0049)	0.0046*** (0.0008)	189,234
Q4	0.0261*** (0.0089)	0.0045*** (0.0015)	221,437	0.0286*** (0.0055)	0.0048*** (0.0009)	167,127
<b>2. HIGH SCHOOL OR VOCATIONAL PROGRAMME</b>						
A) By gender						
Males	0.0214** (0.0102)	0.0025** (0.0012)	528,607	0.0224*** (0.0041)	0.0026*** (0.0005)	407,762
Females	0.0137** (0.0061)	0.0011** (0.0005)	435,600	0.0155*** (0.0049)	0.0011*** (0.0004)	335,344
B) By age						
23 or younger	0.0171** (0.0082)	0.0027** (0.0013)	589,836	0.0187*** (0.0040)	0.0028*** (0.0006)	456,164
Older 23	0.0349** (0.0170)	0.0007** (0.0003)	374,371	0.0299*** (0.0101)	0.0004*** (0.0001)	184,004
C) By income						
Q1	0.0134 (0.0083)	0.0017 (0.0011)	253,025	0.0139** (0.0060)	0.0018** (0.0008)	202,707
Q2	0.0242** (0.0102)	0.0029** (0.0013)	241,104	0.0247*** (0.0048)	0.0029*** (0.0006)	185,060
Q3	0.0169* (0.0098)	0.0017* (0.0010)	249,680	0.0177*** (0.0047)	0.0017*** (0.0005)	188,714
Q4	0.0116** (0.0053)	0.0010** (0.0004)	220,566	0.0125** (0.0049)	0.0010*** (0.0004)	166,675
<b>3. TERTIARY EDUCATION</b>						
A) By gender						
Males	0.0116*** (0.0040)	0.0014*** (0.0005)	528,607	0.0083* (0.0048)	0.0010* (0.0006)	407,735
Females	0.0062* (0.0036)	0.0009* (0.0005)	435,600	0.0045 (0.0044)	0.0007 (0.0007)	335,334
B) By age						
23 or younger	0.0093*** (0.0032)	0.0013*** (0.0004)	589,836	0.0070 (0.0048)	0.0010 (0.0007)	456,164
Older 23	0.0053 (0.0045)	0.0005 (0.0004)	244,395	0.0037 (0.0037)	0.0003 (0.0003)	186,474
C) By income						
Q1	-0.0161*** (0.0037)	-0.0020*** (0.0005)	253,025	-0.0192*** (0.0069)	-0.0023*** (0.0008)	202,642
Q2	0.0093* (0.0052)	0.0012* (0.0007)	241,104	0.0055 (0.0075)	0.0007 (0.0009)	184,947
Q3	0.0219*** (0.0046)	0.0028*** (0.0006)	249,680	0.0202*** (0.0045)	0.0026*** (0.0006)	188,736
Q4	0.0216*** (0.0072)	0.0032*** (0.0011)	220,566	0.0236*** (0.0056)	0.0035*** (0.0008)	166,698

Notes: Standard errors are clustered at country (regional) level.\*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

back to education that can explain the overall trend. Or, alternatively, is it both groups?. To this end, we exploit the longitudinal component of the EU-SILC data that follows individuals during four periods and create a dependent variable that takes the value one if the individual transitioned from employment, unemployment or inactivity (different from being student) at time  $t - 1$  to education at time  $t$  and zero otherwise.

**Table 5:** Main results: Back to education and unemployment rate

	At country level			At regional level		
	Raw	+ Individual characteristics	+ Family income	Raw	+ Individual characteristics	+ Family income
	(1)	(2)	(3)	(4)	(5)	(6)
UR (t)	0.0353*** (0.0085)	0.0399*** (0.0093)	0.0383*** (0.0092)	0.0288*** (0.0098)	0.0324*** (0.0093)	0.0309*** (0.0092)
Marginal effect	0.0015*** (0.0004)	0.0016*** (0.0004)	0.0015*** (0.0004)	0.0012*** (0.0004)	0.0013*** (0.0004)	0.0012*** (0.0004)
UR (t-1)	0.0459*** (0.0087)	0.0509*** (0.0089)	0.0490*** (0.0089)	0.0385*** (0.0093)	0.0428*** (0.0087)	0.0411*** (0.0085)
Marginal effect	0.0020*** (0.0004)	0.0021*** (0.0004)	0.0020*** (0.0004)	0.0016*** (0.0004)	0.0017*** (0.0003)	0.0016*** (0.0003)
UR (t-2)	0.0541*** (0.0097)	0.0580*** (0.0097)	0.0561*** (0.0096)	0.0401*** (0.0095)	0.0439*** (0.0097)	0.0420*** (0.0095)
Marginal effect	0.0024*** (0.0004)	0.0023*** (0.0004)	0.0023*** (0.0004)	0.0017*** (0.0004)	0.0017*** (0.0004)	0.0016*** (0.0004)
Observations	208,595	207,584	207,531	164,461	163,806	163,790
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: Results from estimating equation 1 using EU-SILC longitudinal microdata from 2004 to 2013. Sample: Youth 16-29 years old. Individual controls include: sex, age, age squared, an indicator variable of whether the individual has a partner, an indicator variable of whether the individual lives with parents and an indicator variable of whether the individual has children. Household income is a set of dummies indicating whether the individual belongs to the second, third or fourth quartile of the income distribution (the first one is omitted). Standard errors are clustered at country (regional) level. Marginal effects are calculated at mean values of the covariates. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

The results in Table 5 indicate a positive relationship between the level of unemployment in a given country or region and young people's decision to return to education. The effect remains after controlling for individual characteristics and household income.<sup>18</sup> Specifically, we find that a 1 percentage point increase of the current population unemployment rate at the country level, can be associated with a 0.15 percentage points increase in the proportion of young people who return to education. This implies that for example in Spain, where the unemployment rate increased 6.6 percentage points in 2009 (from 11.3% in 2008 to 17.9%), the proportion of young people who returned to education would have increased by 1 percentage point during that year, which is equivalent to almost 79,000 individuals.<sup>19</sup> The marginal effects are even higher when considering the lagged unemployment rate: a 1 percentage point increase of the unemployment rate one or two years earlier is associated with about 0.2 percentage points increase in the proportion of young people who return to education.

<sup>18</sup>Table ?? in the Appendix shows all the coefficients of the control variables included.

<sup>19</sup>The Spanish population between 16 and 29 years old was 7,9 million in 2010 according to the National Statistics Institute (see [www.ine.es](http://www.ine.es)).

As can be also seen in columns 4, 5 and 6 of Table 5, the results are quite similar when exploiting the regional variation in the unemployment rates. In this case, the effect varies from 0.12 to 0.16 percentage points depending on the period of the unemployment rate considered. Our results are robust to the unemployment measure chosen, different adjustments of the standard errors and specifications and also to the sample of countries (see Table A.5 in the Appendix.).<sup>20</sup>

Our results therefore suggest that during the Great Recession, a non-negligible proportion of young Europeans decided to return to education. Dellas and Sakellaris (2003) is the only other paper that we know of that investigates whether individuals who return to the educational system drive the effect on total enrollment in the United States in the late 60s to late 80s. Given that they do not have panel data, they look at the results by age and find that, the older the individual, the lower the effect, suggesting that their results are mainly driven by the enrollment of new cohorts and that the effect of those returning to education is more limited. They conclude that, in their case, the effect of the business cycle is permanent on schooling decisions as those that left education do not return to it when worsening economic conditions. In our case, and given the fact that we find a clear effect looking at those who decide to return to education, it implies that for some young individuals the effect of the business cycle in Europe is transitory on their schooling decisions: they substitute education in a boom but return to formal education when economic activity falls.<sup>21</sup>

### *Subgroup analysis*

Having confirmed the robustness of our findings for an increase in the proportion of young people who return to education during bad economic conditions, we now turn to the subgroup analysis. We again explore whether there are differences by gender, age, educational level and household income, but also by previous labour market status.

The results are displayed in Table 6. As can be seen in Panel A, there are differences by gender: while an increase in the unemployment rate leads to some young men to return to education, the same is not true for young women. Indeed, the effect is lower and the coefficient is estimated with less precision for girls.<sup>22</sup> As argued in the previous section, one possible explanation is that the female unemployment rate increased less than the male unemployment rate during the Great Recession or simply, that girls take their schooling decisions independently of the macroeconomic environment.

Panel B presents the results by age group (divided by the median): those who are 25 years old or younger, and those older than 25. The results suggest that the business cycle has a stronger effect on the propensity to return to education of those younger than 25. For this group, a 1 percentage point increase in the unemployment rate leads to an increase between 0.25 and 0.30 percentage points in the probability to return to

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<sup>20</sup>We carry out the same robustness checks than in the previous section and our qualitative findings are unchanged.

<sup>21</sup>To test whether this is a characteristic of the European countries in comparison with the United States or is rather a new trend brought by the Great Recession is an empirical question that is beyond the scope of this paper. For example, Long (2004) hypothesis for the US that college decisions may have become more linked to the development of the economy in recent decades. In any case, it is important to note that the Great Recession in Europe has been different from other periods of economic downturn in the sense of being particularly hard on young people.

<sup>22</sup>Differently from our results, Dellas and Sakellaris (2003) do not find gender differences in the cyclicity of enrollment in college education in the United States.

education. This finding is consistent with the argument that the opportunity cost is lower for younger than for older youth (Alessandrini et al., 2015) and confirms the results found in the previous section.

In Panel C we show the analysis by educational level. Note that despite that we observe the current educational level, it is unlikely that we are capturing the degree reached after returning to education given that we study transitions in a one-year window. The results indicate that only those who have a High School degree or lower decide to return to education during a recession. Specifically, a one percentage point increase in the unemployment rate is associated with an increase between 0.11 and 0.16 percentage points in the likelihood that a young person who dropped out from High School returns to education, and between 0.15 and 0.17 in the case of youths with a High School degree. By contrast, our findings suggest that bad economic conditions do not lead to young people who already have a college degree to enrol in education again. As Alessandrini et al. (2015) point out, low-productivity individuals tend to react more to changes in the labor market conditions because they face a lower opportunity cost of education and a higher marginal product of human capital.

We then analyse the effect depending on the individuals' initial labour status. As can be seen in Panel D of Table 6, the decision to come back to the educational system is counter-cyclical for those who were employed or unemployed one year earlier, although the estimates are less robust for the latter group for which the number of observations in our sample is substantially lower. In the case of inactive individuals (not students), none of the specifications yields statistically significant results. This is a very heterogeneous group that includes permanently disabled individuals, those in compulsory military service or "other inactive".<sup>23</sup>

Finally, we explore whether the labour market conditions affect the decision to return to education in a different way depending on household income. As can be seen in Panel E, the effect of an increase in the unemployment rate on the propensity to return to education is stronger for those in the highest quartiles of the income distribution. For those young people in the lowest income quartile, the effect is smaller when the analysis is carried out at country level and even not statistically significant in the analysis at regional level. As in the previous section, this finding suggests that the ability-to-pay played a role not only in the probability to engage in the educational system for the new cohorts but also for those who wanted to return to education during the Great Recession in Europe.

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<sup>23</sup>If the group of young people not in employment or in education (NEET) belongs in part to this category of "other inactive", our results indicate that worst economic conditions do not necessarily bring them back to education.

**Table 6:** Back to education and unemployment rate - Subgroup analysis

	At country level		At regional level	
	UR(t)	Marginal effect N	UR(t)	Marginal effect N
<b>A) By gender</b>				
Males	0.0566*** (0.0105)	0.0022*** (0.0004)	0.0481*** (0.0138)	0.0018*** (0.0005)
Females	0.0181* (0.0099)	0.0008* (0.0004)	0.0124 (0.0093)	0.0005 (0.0004)
<b>B) By age</b>				
25 or younger	0.0408*** (0.0097)	0.0027*** (0.0006)	0.0347*** (0.0087)	0.0022*** (0.0005)
Older than 25	0.0328*** (0.0092)	0.0005*** (0.0001)	0.0209 (0.0188)	0.0004 (0.0003)
<b>C) By highest educational level</b>				
HS drop out	0.0450*** (0.0146)	0.0016*** (0.0005)	0.0324** (0.0131)	0.0011** (0.0005)
HS graduated	0.0379*** (0.0131)	0.0017*** (0.0006)	0.0360*** (0.0120)	0.0015*** (0.0005)
College degree	0.0167 (0.0162)	0.0005 (0.0005)	0.0125 (0.0173)	0.0004 (0.0005)
<b>D) By labour status at <math>t-1</math></b>				
Employed	0.0470*** (0.0077)	0.0014*** (0.0002)	0.0423*** (0.0095)	0.0012*** (0.0003)
Unemployed	0.0332** (0.0169)	0.0020** (0.0010)	0.0183 (0.0173)	0.0011 (0.0010)
Inactive (not students)	0.0054 (0.0136)	0.0004 (0.0010)	0.0038 (0.0140)	0.0003 (0.0010)
<b>E) By income quartiles</b>				
Q1	0.0301*** (0.0108)	0.0015*** (0.0005)	0.0142 (0.0153)	0.0007 (0.0007)
Q2 <sup>a</sup>	0.0307** (0.0150)	0.0013** (0.0007)	0.0158 (0.0106)	0.0007 (0.0005)
Q3	0.0498*** (0.0160)	0.0017*** (0.0005)	0.0435** (0.0177)	0.0014** (0.0006)
Q4	0.0637*** (0.0150)	0.0021*** (0.0005)	0.0705*** (0.0147)	0.0024*** (0.0005)

Note: Results from estimating equation 1 using EU-SILC longitudinal microdata from 2004 to 2013. Sample: Youth 16-29 years old. All specifications control for individual characteristics and household income and include year and country (region) fixed-effects. Standard errors are clustered at country (region) level. Marginal effects are calculated at mean values of the covariates. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$  a. The effect of regional UR had to be estimated without control variables because otherwise the model does not converge. We check the results estimating also the other quartiles without controls and the results are almost the same.

### 5.3 School retention

For completeness, we have also run all the specifications for the group of young people that is consecutively engaged in education. The results are not shown to save space but are available from the authors upon request. In this case, the dependent variable takes value one if the individual is a student at  $t - 1$  and at  $t$ , and zero if the individual is a student at  $t - 1$  but changed status at  $t$ . Naturally, with the data at hand, we cannot distinguish those individuals that are retained because their studies have not been completed, from those that decide to continue studying (possibly moving to a higher educational level) because of the macroeconomic conditions. Notwithstanding this, main results indicate a positive relationship between the unemployment rate and school retention, however, the results are not robust across specifications being the coefficient for the unemployment rate at country level statistically significant at 10% when using controls, while the coefficient for unemployment at regional level is significant at 1% in all regressions. In this case, a 1% increase in the regional unemployment rate is associated with a between 0.24 and 0.31 increase in school retention. The coefficients for lagged unemployment rates are not precisely estimated in any of the specifications at country level while, at the regional level, the significance goes down to 5% when the unemployment rate refers to  $t - 1$  and to 10% for the unemployment rate at  $t - 2$ .

In the analysis by subgroups, we find similar relationships when considering gender and age than those already documented —though significance varies depending on the specification. Interestingly, results indicate that school retention during bad times is mostly driven by University students being the coefficient for the unemployment rate significant at 1% in all regressions. For example, a 1% increase in the unemployment rate at country level increases retention by 0.9 percentage points while the same figure when economic conditions are measured at the regional level is 0.8. In other words, growing unemployment rates enhance retention among University students —as similarly found by Long (2015) for the US— but the same is not true for those that have not yet graduated from High School. Finally, by household income, once more, individuals belonging to the first quartile do not show a higher probability of school retention associated with higher unemployment rates, again, indicating the great difficulties to acquire education for those at the bottom end of the income distribution in comparison with those with higher household income.

## 6 Conclusions

This is the first paper to study enrollment, returns to education and school retention of young people in 28 European countries during the Great Recession. We analyse to what extent rising unemployment rates can be associated with more young people engaged in non-compulsory education. To this end, we use two sources of data: (1) the cross-sectional component of the European Union - Statistics on Income and Living Conditions which allows the analysis of total enrollment, and (2) its longitudinal component which follows individuals for four consecutive waves thus, permitting the identification of returns to education and school retention. The period under analysis starts in 2004 and ends in 2014.

Main results show that young Europeans were more likely to enroll in education in response to the bad labour market conditions brought by the recession. A one percentage point increase in the population unemployment rate translated in a 0.28 to 0.42 percentage

points increase in the probability of being enrolled in education. Moreover, our analysis by educational level revealed that the overall trend is mostly driven by those enrolling in non-compulsory secondary education (rather than University students). As documented before in the literature for the United States, also in Europe, unskilled individuals are more likely to react to the adverse economic conditions by engaging in education.

In our analysis by socio-demographic characteristics, we found that males and younger individuals are more likely to be enrolled in education in response to rising unemployment, but more importantly, our results also showed that not all young people have had the same chances to be enrolled in education during the period: boys and girls in households at the lowest end of the income distribution (first quartile) are not equally more likely to be enrolled in education as their richer counterparts. The results are particularly worrisome in the case of University studies: youths in the lowest quartile are actually less likely to be enrolled in tertiary education along the Great Recession. This is the only pro-cyclical result that we find in the whole paper indicating that actually the effect for “ability-to-pay” (or rather, inability, in this case) has dominated the “opportunity cost” among individuals from more disadvantaged backgrounds.

In order to gain a more nuanced understanding of the overall trend of increased enrollment, we have used longitudinal data to be able to isolate the effect of returns to education from that of school retention. Importantly, while we find that both groups can explain the overall trend, it is transitions back to education that have the most robust link with the macroeconomic conditions.<sup>24</sup> This means that, in the case of Europe, we can establish a transitory effect of the business cycle on human capital accumulation decisions by which those that substituted away education in good times, often come back to it. Instead, rising unemployment rates have a less robust impact on those that are already in the educational system and are school retained. Once more, the increased trend of transitions back to education is mostly driven by High School drop-outs and High School graduates (and not by those holding a University degree) uncovering the increased need for skill acquisition among those with less opportunities in the labour market. Finally, returns to education have been found to be more likely also among those belonging to the richer quartiles.

Our findings suggest that not only the Great Recession in Europe brought by a change in the pattern of young people’s schooling decisions, it also increased the inequality of opportunities in skills acquisition according to socio-economic characteristics. The reasons behind our results are difficult to disentangle given the great heterogeneity of the countries under analysis and the different responses to the Great Recession that each took, but probably, education cutbacks in the form of higher tuition fees or a reduced number of scholarships, are behind our results.

Policy implications of our findings are straightforward. Austerity measures in periods of economic downturn should not be imposed at the price of further jeopardising the possibilities for skills acquisition of that part of the population that, because of their poor background, already have the greatest difficulties to be engaged in non-compulsory education. The educational sector acted as a buffer for many young people during the Great Recession but it is up to policymakers to make sure that such cushion exists in equal terms for everyone.

This analysis has several limitations. Our results are necessarily an imperfect measure of the impact of the Great Recession on school attendance because we cannot control for

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<sup>24</sup>In this respect, this paper also provides new evidence to guide theoretical applications as for the cyclicity of schooling in Europe.



young people's patterns of emigration in search of labour market or educational opportunities. Moreover, our results based on longitudinal data may be limited by the fact that the EU-SILC survey does not follow equally well all young people in the different countries. Finally, our results may be biased by attrition, something that the EU-SILC can improve upon.

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# A Appendix

**Table A.1:** Countries in the analysis and period of time covered

Country	Period of time covered
Austria (AT)	2004–2013
Belgium (BE)	2004–2013
Bulgaria (BG)	2006–2013
Cyprus (CY)	2005–2013
Czech Republic (CZ)	2005–2013
Denmark (DK)	2004–2013
Estonia (EE)	2004–2013
Finland (FI)	2004–2013
France (FR)	2004–2013
Greece (GR)	2004–2013
Hungary (HU)	2005–2013
Iceland (IS)	2004–2013
Ireland (IE)	2004–2013
Italy (IT)	2004–2013
Latvia (LV)	2005–2013
Lithuania (LT)	2005–2013
Luxembourg (LU)	2004–2013
Malta (MT)	2006–2013
Netherlands (NL)	2005–2013
Norway (NO)	2004–2013
Poland (PL)	2005–2013
Portugal (PT)	2004–2013
Romania (RO)	2007–2012
Slovakia (SK)	2005–2013
Slovenia (SI)	2005–2013
Spain (ES)	2004–2013
Sweden (SE)	2004–2013
United Kingdom (GB)	2005–2013

**Table A.2:** Detailed results of main estimates in Panel A of Table 2

	At country level			At regional level		
	Raw	+ Individual characteristics	+ Family income	Raw	+ Individual characteristics	+ Family income
	(1)	(2)	(3)	(4)	(5)	(6)
UR (t)	0.0178*** (0.0058)	0.0175** (0.0081)	0.0169** (0.0078)	0.0152*** (0.0032)	0.0161*** (0.0042)	0.0157*** (0.0042)
female		0.7726*** (0.0530)	0.7728*** (0.0542)		0.8193*** (0.0208)	0.8199*** (0.0211)
age		1.0912*** (0.2514)	1.0983*** (0.2551)		1.2217*** (0.0845)	1.2304*** (0.0857)
agesq		-0.0292*** (0.0057)	-0.0294*** (0.0059)		-0.0322*** (0.0020)	-0.0325*** (0.0021)
noeman		-0.0245 (0.1617)	-0.0458 (0.1533)		0.0981 (0.0602)	0.0640 (0.0590)
partner		-0.9844*** (0.0742)	-0.9976*** (0.0811)		-0.9466*** (0.0440)	-0.9698*** (0.0503)
haschildren		-0.8841*** (0.1028)	-0.8638*** (0.0867)		-0.9489*** (0.0494)	-0.9210*** (0.0463)
quart2			-0.0317 (0.0664)			0.0057 (0.0433)
quart3			-0.0473 (0.0884)			0.0053 (0.0592)
quart4			0.1641 (0.1137)			0.2144*** (0.0665)
Observations	969,539	969,315	968,610	746,113	746,040	745,342
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: Results from estimating equation 1 using the pooled EU-SILC cross-sectional microdata from 2004 to 2014. Sample: Youth 16-29 years old. Standard errors are clustered at country (regional) level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table A.3:** Enrollment in education and unemployment rate: Robustness checks

	At country level	At regional level
A) Using youth UR		
UR (t)	0.0084*** (0.0027)	0.0077*** (0.0014)
Marginal effect	0.0015*** (0.0005)	0.0014*** (0.0003)
B) Clustering SE at year*country (region)		
UR (t)	0.0169*** (0.0054)	0.0157*** (0.0027)
Marginal effect	0.0031*** (0.0010)	0.0028*** (0.0005)
C) Adding a linear time trend		
UR (t)	0.0169** (0.0078)	0.0157*** (0.0042)
Marginal effect	0.0031** (0.0014)	0.0028*** (0.0007)
D) Adding linear time trends by country (region)		
UR (t)	0.0166** (0.0079)	0.0155*** (0.0042)
Marginal effect	0.0030** (0.0014)	0.0028*** (0.0007)
E) Keeping countries with data from 2004-2005		
UR (t)	0.0182** (0.0086)	0.0179*** (0.0046)
Marginal effect	0.0028** (0.0013)	0.0027*** (0.0007)

Notes: Results from estimating equation 1 using the pooled EU-SILC cross-sectional microdata from 2004 to 2014. Sample: Youth 16-29 years old. All specifications control for individual characteristics and household income and include year and country (region) fixed-effects. Standard errors are clustered at country (region) level, except in Panel B. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table A.4:** Detailed results of main estimates in Panel A of Table 5

	At country level			At regional level		
	Raw	+ Individual characteristics	+ Family income	Raw	+ Individual characteristics	+ Family income
	(1)	(2)	(3)	(4)	(5)	(6)
UR (t)	0.0353*** (0.0085)	0.0399*** (0.0093)	0.0383*** (0.0092)	0.0288*** (0.0098)	0.0324*** (0.0093)	0.0309*** (0.0092)
Female		0.4949*** (0.0400)	0.4905*** (0.0403)		0.5264*** (0.0541)	0.5227*** (0.0545)
Age		-0.6795*** (0.2046)	-0.6751*** (0.2075)		-0.5915*** (0.1463)	-0.5831*** (0.1454)
Age squared		0.0088** (0.0044)	0.0088** (0.0044)		0.0070** (0.0032)	0.0070** (0.0032)
Living with parents		0.0600 (0.0782)	0.1201** (0.0580)		0.1073 (0.0687)	0.1572** (0.0676)
Living with a partner		-0.8657*** (0.0935)	-0.8131*** (0.1067)		-0.8600*** (0.1004)	-0.8178*** (0.1062)
Has own children		-0.3491*** (0.1290)	-0.4089*** (0.1071)		-0.3603*** (0.1056)	-0.4095*** (0.1036)
Hh. income (2nd. quartile)			-0.0996 (0.1086)			
Hh. income (3rd. quartile)			-0.3576*** (0.1153)			
Hh. income (4th. quartile)			-0.2567 (0.1620)			
Observations	208,595	207,584	207,531	164,461	163,806	163,790
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: Results from estimating equation (1) using EU-SILC panel microdata from 2004 to 2013. Sample: Youth 16-29 years old. Standard errors are clustered at country (regional) level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

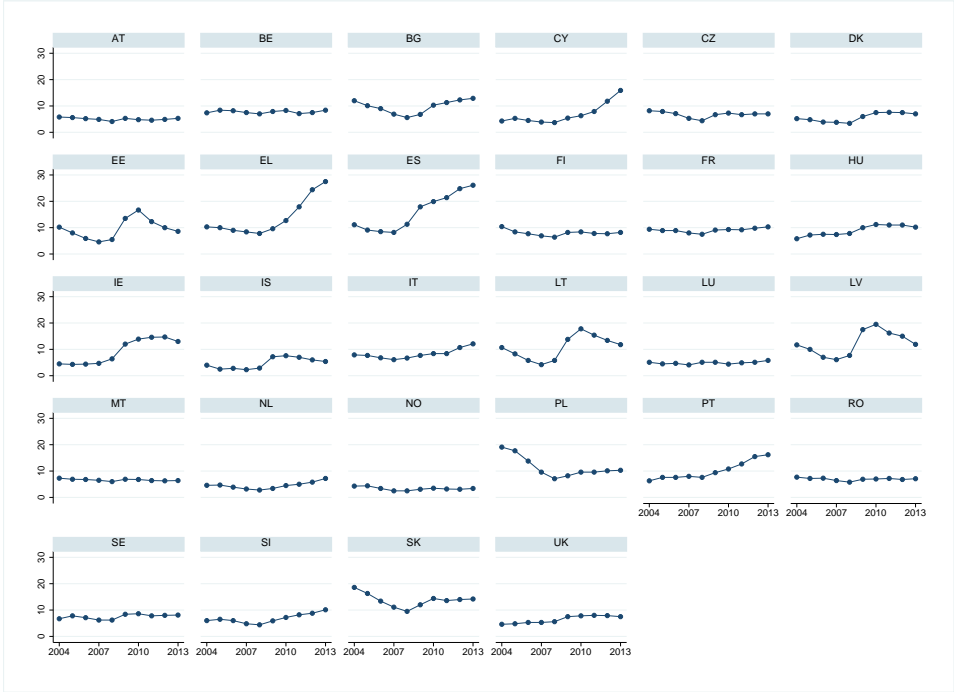


**Table A.5:** Back to education and unemployment rate: Robustness checks

	At country level	At regional level
A) Using youth UR		
UR (t)	0.0198*** (0.0052)	0.0172*** (0.0042)
Marginal effect	0.0008*** (0.0002)	0.0007*** (0.0002)
B) Clustering SE at year*country (region)		
UR (t)	0.0383*** (0.0109)	0.0309*** (0.0083)
Marginal effect	0.0015*** (0.0004)	0.0012*** (0.0003)
C) Adding a linear time trend		
UR (t)	0.0383*** (0.0092)	0.0309*** (0.0092)
Marginal effect	0.0015*** (0.0004)	0.0012*** (0.0004)
D) Adding linear trends by country (region)		
UR (t)	0.0417*** (0.0098)	0.0307*** (0.0096)
Marginal effect	0.0017*** (0.0004)	0.0012*** (0.0004)
E) Keeping only countries with data from 2004/05 to 2013		
UR (t)	0.0381*** (0.0095)	0.0306*** (0.0093)
Marginal effect	0.0016*** (0.0004)	0.0012*** (0.0004)

Notes: Results from estimating equation (1) using EU-SILC panel microdata from 2004 to 2013. Sample: Youth 16-29 years old. All specifications control for individual characteristics and family income and include year and country (region) fixed-effects. Standard errors are clustered at country (region) level, except in Panel B. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Figure A.1:** Unemployment rate trends at country level, 28 European countries, 2004–2013



Source: Labour Force Survey, Eurostat.

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