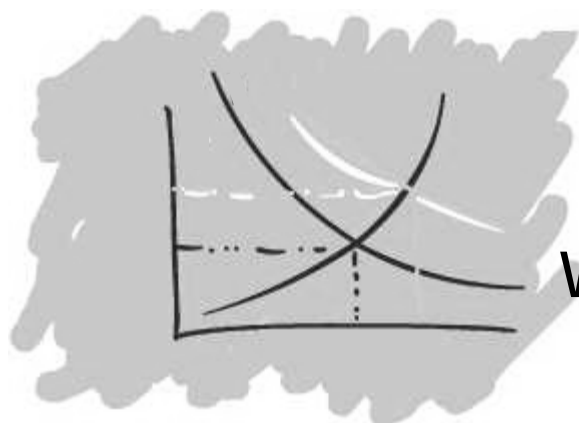# ECONOMIC ANALYSIS

WORKING PAPER SERIES

SCHOOL TO WORK TRANSITIONS AND THE IMPACT OF PUBLIC EXPENDITURE ON EDUCATION

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SCHOOL TO WORK TRANSITIONS AND THE IMPACT OF PUBLIC EXPENDITURE ON EDUCATION

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Abstract

In this paper we analyse how the decentralization process of the Spanish educational system has affected the school-to-work transition of youths over the last years. Using individual data from the Spanish Labor Force Survey for the period 1993-2002, we estimate a simultaneous equation model for the unemployment and employment hazard rates of these workers. We include public expenditure on education, at the regional level, as an explanatory factor in both hazards. Furthermore we account for cross-regional differences regarding the decision-making authority over education. Our results reveal that for both, university and non-university levels, public expenditure on education significantly improves the chances of Spanish youths in finding the first job after completing the educational system. However, it seems that the decentralization of university education has negative effects on youths' labor market prospects in terms of exiting from unemployment, while no effects are observed for the case of non-university education.

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1. Introduction

A decisive event in the life of most young people is when they leave school and enter the labor market. Today's transition from school to work is often described as a turbulent and uncertain period of young people (OECD, 1996b; EUROSTAT, 1997; Galland, 1997; Urquiola et al., 1997).

Improving the transition from school to the labor market had gradually entered into the political and social debate in many OECD countries, and many reforms have been enacted to facilitate this transition. Most of the policies aimed at youth are related to the institutional links between school and the labor market and the common thread in initiatives to improve the transition has been attempts to develop more flexible paths between education/learning and employment (OECD, 1996b). Previous research works (Shavit and Müller, 1998; Hannan et al., 1999) have found that institutional settings, and particularly educational and training systems and their link to labor market entry, greatly influence individual transitions from education to working life. Nonetheless, educational reforms aimed at improving school-to-work transitions are not only designed to link education to the job market, but also to improve educational quality. Although, most of empirical work on the effects of human capital on economic outcomes has focused on the overall role of school attainments, that is the quantity of schooling, recent works have also put attention to quality of education.[2] This literature concentrates on the effectiveness of school-to-work programs as well as test-based educational reforms in improving school-to-work transitions and more general economic outcomes. In general, it is found that educational reforms should deal with both school-to-work programs in high schools and efforts to raise academic achievement through the improvement of educational quality.

Basically, educational systems are divided into two groups. One is the well-known dual system, where students have the choice between an academic or vocational pathway at an early stage. The other group includes systems characterized by a range of relations between school and work experience. However, it should be noted that in Spain, as in almost all OECD countries, general education is the track followed by the large majority of young people. Furthermore, the Spanish public sector has played a key role in education. Public expenditure on education has increased significantly over the last decades, and local governments have progressively obtained decision-making authority over education. It would be

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[2] See "School-to-work and educational reform symposium", *Economics of Education* Review, vol 25 (4), 347-402 (2006).

expected therefore that both, public expenditure on education and the decentralization process had affected the transition from school to stable work in Spain over the last years. In particular, they might have influenced not only the individual probability of leaving the first unemployment period after leaving school, but also the stability of the first employment after school.

In this paper, we concentrate on labor market outcomes of young people after leaving the educational system, hereafter called school leavers. We try to address several question regarding school-to-work transitions in Spain: How well have new school leavers fared in terms of employment an unemployment hazard rates?; Do their employment and unemployment probabilities differ across regions with and without decision-making authority over education?; How public expenditure on education affect the labor market prospects of these people?; How the educational decentralization process has affected such prospects?.

Our results suggest that, devoting higher amounts of funds to education increases the opportunities and reduces the time school-leavers spend in finding a job. This is observed for both university and non-university education. However, for the case of university education, decentralization seems to have negative outcomes in terms of unemployment hazard rates. In contrast, for the case of non-university education we do not find significant differences between regions with and without decision-making authority over education when examining the unemployment hazard rates.

The paper is organized as follows. Next section provides an overview on school-to-work transitions. Section 3 focuses on the decentralization process and the experience of the Spanish educational system. Section 4 describes the empirical approach to estimate the hazard rates. Section 5 presents the estimation sample and Section 6 contains the main results. Finally, Section 7 concludes.

2. School-to-work transitions

After leaving the high school, individuals are faced with deciding whether to attend university education or enter the labor market. This decision is usually taken based on the expected returns of investing in university education. If there is competition for good quality jobs, individuals with higher educational levels are expected to get more likely a job after finishing education, which obviously increases their expected returns from education. In this sense, attending university education is an extremely attractive investment alternative from an individual point of view.

Over the last decades, the Spanish university system has experienced a rapid expansion. As a consequence, the proportion of people with tertiary education in Spain has increased significantly and reached similar levels as in other OECD countries. But investment in human capital is not only made at the individual level, but at the aggregate level. In Spain, government's decisions on education expenditure has been gradually transferred to the regional governments over the twenty years following the promulgation of the Constitution of 1978, which introduced a quasi-federal system for the territorial organization of the state.

Previous literature has analyzed the effects of education on the transition from education to the labor market. Dolado, Felgueroso and Jimeno (2000) find that workers with a university degree have higher employment rates than workers with high school or with a college diploma (although this result is only observed after 30 years of age). Bover, Arellano and Bentolila (2002) find that holding a university degree increases the unemployment hazard rate only at the beginning of the unemployment spell. After the third month, the presence of negative duration dependence reduces the exit rates of college graduates below those of less educated workers. Bover and Gómez (2004) investigate the determinants of exit rates from unemployment to permanent and temporary jobs. Splitting the sample by the type of job found, these authors explain the puzzling negative or non-significant effect of university education on the unemployment hazard rate in general, found by Bover *et al.* (2002). They show that having a university degree reduces the unemployment hazard rate to a temporary job and increases the one to a permanent job. García-Pérez (1997) finds that, for unemployment durations shorter than 12 months, qualified workers are more likely to leave unemployment than non-qualified workers. However, the opposite is observed when the unemployment duration exceeds 12 months. He also finds that the employment hazard rates are substantially lower among qualified workers.

It seems, therefore, that the effect of education on the Spanish exit rates from unemployment and employment has been the subject of study of many papers in the recent literature. However, we do not find any study that analyses the impact of regional governments' decisions on education public expenditure over these hazard rates. The question addressed in this paper deals on how these regional governments' decisions affect the successfulness of the transition process from school to work at the individual level. Is it possible for instance that, all else equal, individuals attending education at different regions face different probabilities of finding a job simply because of differences in the public

expenditure on education of their respective regions? If this is the case, then government's policies in terms of education would play an important role in the performance of the labor market.

In this regard, Spain is an interesting case. After the transition to a democratic regime in the late 1970s, a process of political devolution has produced a significant transfer of human and financial resources from the Central Administration to Regional Governments and Local Corporations. This decentralization process has been especially important in the case of education, whose management was transferred from the Central Administration to Regional Governments in all the regions but at different moments in time. This cross-regional variability claims for an empirical study to examine how the transfer of decision-making authority over education has affected school-to-work transitions in Spain over the last years.

3. Decentralization of the educational system: the Spanish experience

Over the last decades there has been a great advocacy of decentralization in educational governance. Several interrelated goals drive decentralization initiatives: increased economic development, increased management efficiency, redistribution of financial responsibility, democratization, neutralization of competing centers of power, and improved quality of education (Weiler, 1993).

As in other policy areas, decentralization of education implies that local governments obtain authority in the allocation of resources (human, material and financial). Thus, through its budgetary authority, local governments deal with the educational system's needs for financial resources.

One of the major arguments for introducing more decentralized structures of governance is based on the claim that decentralization may yield considerable efficiency in the management of educational systems. First, decentralization of the educational system is expected to mobilize and generate resources that are not available under more centralized conditions. In particular, decentralized systems of education do more actively involve a broader range of social institutions and groups contributing resources that, under centralized forms of governance, were not available or were used to other purposes. And second, decentralized systems can utilize available resources more efficiently, especially in the medium and long run. This is based on the assumption that decentralization increases familiarity with local conditions and

needs, which would lead to a better match between demand and supply and thus a more efficient utilization of limited resources (Cheema and Rondinelly, 1983).

All these advantages might explain that, in recent years, education decentralization had become a popular reform carried out by governments around the world. However, it is necessary to point out that decentralization might also have negative consequences if local governments are influenced by local elites. In such a case, local needs in terms of education might be deteriorated, and we could observe some regions funding education at a much lower level than others.

3.1. Decentralization process of the Spanish educational system

Over the last 30 years Spain has experienced a transition from the most centralized to one of the most decentralized nations in Europe. This decentralization has taken place in all type of policies but has been especially intense in education. This decentralization process began after Franco's government, when the education spending was only 1.78% of Spanish GNP compared to the 5.1% European average. From the beginning of the transition through the mid-1990s, the growth in expenditures on education was greater than 2.3 times the growth in the GDP[3]. And in 1996 educational expenditures represented more than 5 percent of GDP.

Spain is one of the few countries to have implemented a far-reaching educational decentralization reform systematically and completely. This process took place in two stages and with differences between university and non-university education. The details of this decentralization process were developed in the decentralization law passed in 1980, "*Ley Orgánica de Financiación de las Comunidades Autónomas*" (LOFCA). In the early eighties, 7 out of the 17 *Autonomous Communities,* or regions, in Spain obtained education spending responsibilities. First, competences in non-university education were transferred to: Catalunya, Basque Country, Andalusia, Galicia, Canary Islands and Valencian Community between 1980 and 1983, and to Navarra in 1990. Then, competences in university education were transferred to the first six regions in 1985 and 1986, and to Navarra in 1990. In 1990 the Law on the General Organization of the Educational System (LOGSE) stalled the decentralization process of the rest of Autonomous Communities until 1998. But, in these regions the competences in university education were first transferred, between 1995 and 1997, and finally those in non-university education

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[3] CIDE. El sistema educativo Español, p.228.

between 1997 and 2000. On January 1, 2000, after a 20-year decentralization process, the 17 regional governments received the complete decision-making authority over education.

Educational decentralization implies the fund transfers to the decentralized Autonomous Communities in the form of tax-sharing block grants. The decentralized regions establish their own public expenditure budget priorities, with some regions devoting higher amounts of funds to education than others. Previous studies provide evidence that the decentralization process has seemed to positively affect education expenditures in those regions with education spending responsibilities. A previous work[4] has showed that during the period 1980-1992, five of the seven decentralized regions increased their per capita education expenditures in relation to the mean of the 17 Autonomous Communities. This increase was very significant for the Basque Country (from 4.05% above the mean in 1980 to 20.44% above in 1992). Of the 10 regions under control of the Ministry of Education during that period, seven lost ground to the mean of the 17 regions. In the rest of the centralized regions the positive variations were not nearly as great as in the decentralized regions.

It seems, therefore, that the ability to set public expenditure priorities in the decentralized regions accounted for a significant measure of the increase in educational spending in these regions. However, an issue that has not been addressed so far is how decentralization of the educational system and public expenditure on education have affected the school-to-work transitions in Spain in the last years.

4.   The empirical approach

Unemployment and employment hazard rates have been considered by many analysts as good indicators of labor market performance, especially during the transition period from school to work. For instance, the length of the search period after completing education is a key policy issue both because of its implications for public costs and because of its impact upon the supply of qualified labor at a time when populations are ageing.

In order to study the hazard rate for both employment and unemployment, we use a discrete-time duration model (see Lancaster, 1990, or Jenkins, 1995 for the basic features of such models). In general, the hazard rates we will estimate are given by the following conditional probability:

$$\phi(t) = \Pr(T = t \mid T \geq t) \tag{1}$$

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[4] E. Uriel, M.L., Moltó, F. Pérez, J. Aldás, V. Cucarella. Las cuentas de la educación en España y sus Comunidades Autónomas 1980-1992 (Madrid: Fundación Argentaria, 1997) pp 177-178.

where T is a discrete random variable denoting either employment or unemployment duration. Following Bover et al. (2002) and García-Pérez (1997), we use a logistic distribution to model the hazard rates, so that the two conditional exit rates can be written as follows:

$$\phi_U(t) = F(\theta_0(t) + \theta_1(t)x(t)) \tag{2}$$

$$\phi_E(t) = F(\gamma_0(t) + \gamma_1(t)x(t)) \tag{3}$$

where $x(t)$ denotes the vector of explanatory variables, some of them varying with spell's duration, t. $\theta_0(t)$ and $\gamma_0(t)$ represent the additive terms of the duration dependence in the hazard rates that we will estimate in the most general way as possible. Finally, $\theta_1(t)$ and $\gamma_1(t)$ are the coefficients for the explanatory factors which in general depend on duration.

In order to avoid the known spurious duration dependence in the hazard rate, generated by the presence of unobserved factors, we control for unobserved heterogeneity, so that we have the following expressions for the hazard rates:

$$\phi_U(t, \eta) = F(\theta_0(t) + \theta_1(t)x(t) + \eta) \tag{4}$$

$$\phi_E(t, \eta) = F(\gamma_0(t) + \gamma_1(t)x(t) + \eta) \tag{5}$$

Furthermore, we will estimate the unemployment and employment hazard rates simultaneously and assuming that unobserved heterogeneity follows a discrete distribution function with different mass points (as used in Heckman and Singer, 1984). In particular, we consider the case of a two-mass-point distribution function, and we estimate the model by maximum likelihood.

The likelihood function considers the three possibilities of censoring present in our data. Firstly, unemployment duration may be censored, in which case employment duration is not observed. Secondly, we may have a completed unemployment spell and a censored employment one. And finally, both unemployment and employment spells may be completed ones, that is, not censored. The individual likelihood function with unobserved heterogeneity can easily be constructed, following García-Pérez and Muñoz Bullón (2001), as follows:

$$L_i(\eta) = \left[\prod_{s=1}^{t_u} \left(1 - \phi_{ui}(s, \eta) \right) \right]^{(1-d_{ui})} \left[\phi_{ui}(t_u) \prod_{s=1}^{t_u-1} \left(1 - \phi_{ui}(s, \eta) \right) \prod_{s=1}^{t_e} \left(1 - \phi_{ei}(s, \eta) \right) \right]^{d_{ui}(1-d_{ei})}$$

$$\left[\phi_{ui}(t_u) \prod_{s=1}^{t_u-1} \left(1 - \phi_{ui}(s, \eta) \right) \phi_{ei}(t_e) \prod_{s=1}^{t_e-1} \left(1 - \phi_{ei}(s, \eta) \right) \right]^{d_{ui}d_{ei}}$$

(6)

where t_u and t_e represent unemployment and employment durations, and d_{ui} and d_{ei} are two indicators that allow us to distinguish between censored and completed unemployment and employment spells respectively. The log-likelihood function with unobserved heterogeneity then takes the form:

$$\ln L = \sum_{i=1}^{N} \ln \int L_i(\eta) dF(\eta)$$

(7)

where $F(\eta)$ is the previously described mass point distribution function..

5.   A first look to the data

Our sample comes from the individual data of the Spanish Labor Force Survey rotating panel, for the period 1993Q1 to 2002Q2. In this survey households are interviewed for a maximum of six quarters. Our sample selection consists of people aged 16-35 that, at the first interview, reveal to be in either of the two following situations: 1) unemployed looking for a first job, or 2) employed and studying one year before. For these individuals we construct two variables measuring, respectively, the duration of the search period after completing education and the duration at first job[5].

For the purpose of this paper we also need data on public expenditure on education. This information is offered by the Spanish Ministry of Education[6]. In particular we select data on public expenditure on university and non-university education at the regional level (*Autonomous Communities*)[7].

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[5] We censor the maximum unemployment duration to 60 months.

[6] Source: www.mec.es/mecd/estadisticas/index

[7] The series of public expenditure on education are deflated using the *National Price Index (base year 1992).* See Tables 1-4 in the Appendix.

As we are interested on the effect of public expenditure on education over the success of young people at the first stages of their working life, for each individual in the sample we will use the data on average public expenditure of the three years before he/she left the educational system (and started the job search). The series on educational expenditure covers the period 1992-2001, and we distinguish between public expenditure in university and non-university education. Nonetheless, at the beginning of the period under analysis, only Andalusia, the Canary Islands, Catalunya, Valencian Community, Galicia, Navarra and the Basque Country present an education department with a specific budget to spend in public education. For the rest of the regions, this budget corresponds to the *National Ministry of Education*, and hence, we have decided to assign to each region according to the total people enrolled in both university and non-university education. That is, we can compare regions with and without decision-making authority over education and examine cross-regional differences in terms of educational spending.

Since 1995, however, the decentralization process of the educational system was restarted. Throughout the years 1995, 1996 and 1997, Aragón, Asturias, the Balearic Islands, Cantabria, Castilla y León, Castilla-La Mancha, Extremadura, Madrid, Murcia and La Rioja received decision-making authority over university education. The transfer process in terms of non-university education took place at different moments in the different regions: the Balearic Islands in 1998; Aragón, Cantabria and La Rioja since 1999; Madrid and Murcia in the second semester of 1999; and Asturias, Castilla y León, Castilla-La Mancha and Extremadura in 2000.

As we are interested in public expenditure on education in per-capita terms, we also need information on people enrolled in university and non-university education for the period 1992-2001. The series of people enrolled in non-university education have been extracted from the Spanish Ministry of Education, while data of people enrolled in university education comes from the Spanish Statistics Institute.[8]

Tables 2 and 4 in the Appendix show the evolution of the public expenditure in education (in per capita terms) for both, university and non-university education.[9] As expected, the numbers corresponding to public expenditure in university education are above the ones corresponding to non-university

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[8] Sources: *Estadísticas de las Enseñanzas no Universitarias. Series e Indicadores 1992-93 al 2001-2002; Series e Indicadores 1993-94 al 2002-03,* and *Estadística de Enseñanza Universitaria.*

[9] In order to construct Tables 2 and 4, we use information provided by Tables 1 and 3 respectively together with information on the number of students enrolled in both university and non-university education in each region.

education for all the regions. Furthermore, we observe an increasing trend for the expenditure in both university and non-university education, except for the Canary Islands and Navarra for which the public expenditure in university education has slightly decreased, in real terms, during the period 1992-2001.

We can also appreciate some differences between regions. Regarding the series of public expenditure in non-university education, it is noteworthy that the Basque Country and Navarra present the highest values, both at the beginning and the end of the period. As regards university education, it is interesting the case of Navarra. It is the unique region (apart from the Canary Islands) in which we observe a decreasing trend in the evolution of public expenditure. Nonetheless, the values at the beginning and the end of the period, for this region, are clearly above the corresponding to the rest of regions.

Table 5 contains the definitions for all the variables used in the estimation process. Given that the model is designed as a simultaneous recursive system, the issue of identification arises naturally. Clearly identification will require exclusion restrictions for some of the exogenous variables of the system. The applied restrictions become clear from this table. The unemployment equation includes the following individual attributes: gender, age when starting job search and the educational level. We also consider as an explanatory variable the three years before leaving the educational system average of public expenditure in education (in per capita terms) at the home region, and a dummy variable that takes value 1 if there is an education department with specific budget to spend in public education during these three years.[10] Finally, we also include region, yearly and quarterly dummies and we control for the structural circumstances in the region by introducing the quarterly employment rate at the home region, and a variable measuring the local employment growth.

Apart from the variables included as explanatory factors in the unemployment hazard rate,[11] in the employment hazard rate we also control for the type of contract, the sector and the type of job match. The type of job match refers to the comparison between job's educational requirements and the educational attainments of workers. The measure of the type of job match is based on an objective method (See Cohn & Khan, 1995; Groot, 1993; Verdugo & Verdugo, 1989). In particular, a worker is defined as over-educated, if his/her years of education are above the mean educational attainments of the corresponding occupation plus one standard deviation. Adequately educated workers are those whose

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[10] Alternative estimations are also done including an interaction of these two variables.

[11] The age variable in the employment equation refers to the one when starting the job.

educational level is higher than the mean educational level of the corresponding occupation minus one standard deviation, and lower than the mean occupational level plus one standard deviation. And finally, a worker is under-educated if his/her educational attainments are below the mean education of the corresponding occupation minus one standard deviation.[12]

The summary statistics of all variables used in our analysis, for both unemployment and employment spells, are provided in Table 6. It is worth mentioning that, when looking at complete unemployment durations, the average period of time spent by Spanish youths in finding a job after completing education is longer than one year. Table 7 shows the mean unemployment and employment durations by different categories: region, gender, educational level and date of entry. Looking at unemployment durations by region, the South-East region presents the shortest unemployment duration (around 12 months for the completed spells). In contrast, we observe the highest unemployment duration for the North-West region (more than 17 months).

Regarding the educational level there are no significant differences at this descriptive level. Mean unemployment durations are slightly shorter for people with secondary and university education compared to those with primary education or those involved in professional schools (named in Spain "Formación Profesional"). We observe, in contrast, significant differences by gender. Females are clearly more likely to exhibit higher unemployment durations than males. However we do not appreciate significant differences between males and females as regards employment durations.

We can also appreciate clear differences in the average unemployment duration by date of entry. As it can be observed the mean unemployment duration, for both censored and uncensored observations, clearly diminishes with the date of entry, so that the shortest unemployment durations are observed from 2000 onwards. In contrast, employment durations show an increasing trend with the maximum level at 1998 for uncensored employment durations.

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[12] Mean educational levels by occupation are constructed using data from the *Spanish Labor Force Survey* rotating panel, for the period 1993Q1 to 2002Q2. The classification of occupations provided by this data set follows the National Classification of Occupations (CNO-94), which is the most recent Spanish adaptation of the International Standard Classification of Occupations (ISCO-88). We use the two-digit level of CNO-94 to compute mean educational levels by occupation. The over-education index is then constructed taking into account the mean educational level of the corresponding occupation associated to the year when the individual found the job.

6. Results

The analysis of our results is based on separate estimations by level of education. First, we present the estimation of the hazard rates for both employment and unemployment durations separately, and second we provide the results obtained from a simultaneous estimation controlling for unobserved heterogeneity. Table 8 reports the estimation results for the subsample of people with university education, and in Table 8' we repeat the same estimations including an interaction of the variables "*Expenditure*" and "*Competences*".[13] The results for the set of controls are quite standard. Male exits earlier from unemployment and suffer a lower exit rate from employment than females. Workers with a long university degree have a lower exit rate from employment. As expected, we find that workers holding a permanent contract exhibit a lower probability of leaving employment. Our results reveal that the better the economic situation in the region where the worker searches or works, the larger is the unemployment hazard rate. Finally, we do not observe a significant effect of search duration on the employment hazard rate. Nonetheless, longer employment durations seem to reduce the probability of leaving a job, as reflected by the coefficient on the variable $Ln(t_e)$ in the employment hazard rate.

The coefficient which raises most interest is the one associated with the public expenditure in university education, included as an explanatory factor in the search and employment equations. The estimated coefficient on this variable seems to be non-significant when looking at the results in Table 8. However, when the interaction between the variables "*Expenditure*" and "*Competences*" is included in the simultaneous equations estimation, we find that public expenditure in university education tends to increase the probability of getting a first job after completing education (see Table 8'). In this sense, investments in university education seem to improve the position of a worker in the labor market. However, we observe significant differences between those regions with and without decision-making authority over education. For those regions with competences in university education transferred, the odd ratio of the variable *"Expenditure"* is 1.20, while for those without these competences transferred it is

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[13] Both separate estimations for the unemployment and employment hazard rates and simultaneous estimations with unobserved heterogeneity are presented. In both, Table 8 and Table 8', the results are in favour of the existence of unobserved factors affecting both employment and unemployment durations.

found to be 28.10. [14] Thus, public expenditure on university education seems to increase the probability of finding a first job after completing schooling especially in those regions where educational spending responsibilities were under control of the Ministry of Education. Furthermore, the odd ratio for the variable *"Competences"* is 0.257, suggesting that the unemployment hazard rate is 74.3 percent lower in those regions with decision-making authority over university education. Finally, we do not observe significant effects of decentralization and public expenditure on education on the probability of leaving employment. [15]

Figure 1 presents the variation in the unemployment hazard rate for the subsample of people with university education, when we increase public expenditure on education. We simulate increases of 10% and 20% in regional public expenditure in university education. As can be observed, school-leavers are more likely to leave the first period of unemployment, the higher the value of public expenditure in education. This effect is particularly important for unemployment durations between 12 and 24 months, where we observe the major differences among the three lines that represent the hazard rates. We can conclude, therefore, that Government's efforts in terms of university education seems contributing to the success in the transition process from school to work. Nonetheless, public expenditure in education does not play any role in lowering the probability of leaving that job (see Figure 3).

The estimation results corresponding to the subsample of people with non-university education are reported in Tables 9 and 9'. [16] In the search equation, unemployment duration-dependence has been taken into account through the inclusion of a three-grade polynomial in $ln(t_u)$. In the employment equation, in contrast, employment duration dependence is taken into account through the inclusion of a one-grade polynomial in $ln(t_e)$. As it occurred with the subsample of people with university education, public expenditure on non-university education significantly increases the individual likelihood of leaving the first period of unemployment, but only when the interaction variable *"Expenditure*Competences"* is

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[14] Odd ratio $= \exp(\beta + \gamma)$ for regions with competences in education, and Odd ratio $= \exp(\beta)$ for regions without competences in education, where β and γ are the estimated coefficient of the variables *"Expenditure"* and *"Expenditure*Competences"* respectively, reported in Table 8'.

[15] We also tried to account for employment duration-dependence through the inclusion of a two-grade polynomial in $ln(t_e)$, but the coefficients keep on being non-significant.

[16] In Table 9' we have added as an explanatory factor an interaction for the variables *"Expenditure"* and *"Competences"* referred to non-university education.

included. However, in contrast to the case of university education, no significant differences are observed between those regions with and without decision-making authority over education.

As we did for the subsample of people with university education, we simulate increases of 10% and 20% in regional public expenditure on non-university education, and we analyze the variations in the unemployment hazard rates (see Figure 2). School-leavers are found to be more likely to leave the first period of unemployment the higher the value of public expenditure on education. And this effect is particularly significant for unemployment durations between 12 and 24 months. However, as can be observed, the magnitude of the effect is smaller than in the case of university education. The same exercise is done for the employment hazard rate (see Figure 4). And in this case, we also compute the employment hazard rate separately, for those regions with and without an educational department with a specific budget to spend in public education (see Figures 4 (a) and 4 (b)). It is worth of mentioning that the employment hazard rates are higher in those regions decision-making authority over education. Furthermore, increasing public expenditure in education does not seem to reduce the employment hazard rate in these regions. In contrast, in those regions where competences in terms of education have not been transferred from the Central Administration, the employment hazard rates are lower, and clearly decreasing in the amount of public expenditure on education. Of course, these results are obtained once we have controlled for any other variable that could be affecting such hazard rates.

As it occurred for the case of people with university education, males are clearly more likely than females to get a job after completing education, but in this case they also exhibit a lower probability of leaving the first job. Regarding the educational variables, we find that higher levels of non-university education tend to increase the probability of getting a job. Furthermore, we observe people with primary education being the most likely to leave employment. We observe a positive and significant effect of the local employment rate on the probability of leaving unemployment, as it occurred in the case of people with university education. And finally, our results reveal that over-educated workers are more likely to leave the first job than those correctly allocated.

7. Concluding Remarks

This paper is intended to analyze how regional governments' decisions affect the successfulness of the transition process from school to work at the individual level. This is a question of political

relevance in Spain, where the management of the educational system has been progressively transferred from the Central Administration to Regional Governments. Since this process has taken place, in the different regions, at different moments in time, it turns out of paramount importance to analyze the cross-regional variability in public spending in order to identify its effect over the transition process from school to work.

For this purpose we use a sample of individuals aged 16-35 years old extracted from the Spanish Labor Force Survey rotating panel, for the period 1993-2002. Furthermore, we use the information provided by the Spanish Ministry of Education and the Spanish Statistics Institute to obtain data on public expenditure on education, at the regional level, for the three years before the individual left the educational system. As both, unemployment and employment hazard rates have been considered as good indicators of labor market performance, we estimate a simultaneous equation model for these hazard rates where both, public expenditure on education in per capita terms and decision-making authority over education are included as explanatory factors. The analysis is made for people with university and non-university education separately. With respect of university education, our results reveal that the chances of finding the first job after completing education are significantly higher for those individuals attending school in regions funding university education at higher levels. Furthermore decentralization of the educational system seems to have negative outcomes in terms of efficiency, since the unemployment hazard rate is found to be higher when the individual attended education in a region without decision-making authority over education. Besides, the positive effect of public expenditure on education in terms of increasing the unemployment hazard rate is found to be much higher in those regions where educational spending has not been transferred from the Central Administration. In contrast, the effect of these factors on the employment hazard rate seems to be non-significant. Regarding non-university education we again find a positive effect of per capita educational spending on the probability of finding a first job. Nonetheless, in this case we do not find significant differences between those regions with and without decision-making authority over education.

Acknowledgements

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Appendix

Tables

Table 1: Public expenditure on non-university education (thousands euros)									
	1992	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
TOTAL	**12.658.929**	**13.212.530**	**13.576.537**	**14.402.971**	**15.148.196**	**15.663.758**	**16.420.286**	**17.872.289**	**18.927.260**	**20.101.872**
Ministry of Education and regional governments (CCAA) with an education department	**11.457.669**	**12.062.170**	**12.334.939**	**13.118.781**	**13.868.993**	**14.384.448**	**15.270.984**	**16.802.441**	**17.916.044**	**18.967.195**
Ministry of Education	4.400.845	4.601.036	4.624.956	5.008.162	5.263.147	5.356.478	5.430.475	4.135.594	709.475	474.412
Andalusia	2.167.507	2.169.943	2.226.970	2.370.345	2.502.982	2.547.429	2.694.629	2.858.491	3.044.315	3.232.983
Aragón	-	-	-	-	-	-	-	437.154	488.943	519.099
Asturias	-	-	-	-	-	-	-	-	421.918	457.065
Balearic Islands	-	-	-	-	-	-	252.206	317.533	344.915	396.606
Canary Islands	616.421	628.401	674.170	747.973	809.047	832.190	877.928	991.207	975.195	1.006.278
Cantabria	-	-	-	-	-	-	-	215.120	235.024	234.501
Castilla y León	-	-	-	-	-	-	-	-	1.070.803	1.159.332
Castilla-La Mancha	-	-	-	-	-	-	-	-	771.032	881.216
Catalunya	1.508.195	1.664.139	1.689.914	1.743.875	1.853.480	2.029.454	2.114.026	2.276.231	2.397.731	2.498.686
Valencian Community	1.007.035	1.075.362	1.130.736	1.159.118	1.236.615	1.298.924	1.410.721	1.566.774	1.698.795	1.844.148
Extremadura	-	-	-	-	-	-	-	-	472.695	566.485
Galicia	801.794	862.955	914.099	935.422	978.603	1.035.368	1.128.581	1.194.579	1.207.862	1.239.163
Madrid	-	-	-	-	-	-	-	943.213	1.879.998	2.068.492
Murcia	-	-	-	-	-	-	-	249.475	533.178	575.282
Navarra	192.465	206.344	213.420	227.217	246.426	261.124	271.300	283.913	306.522	330.887
Basque Country	763.407	853.990	860.674	926.669	978.693	1.023.481	1.091.118	1.234.045	1.240.379	1.354.640
La Rioja	-	-	-	-	-	-	-	99.112	117.264	127.920
Other public administrations	**1.165.914**	**1.149.561**	**1.223.307**	**1.273.774**	**1.231.134**	**1.279.843**	**1.141.890**	**1.314.266**	**1.299.401**	**1.453.386**

Table 2: Deflated public expenditure on non-university education (in per capita terms)										
	1992	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Andalusia	1,340	1,292	1,285	1,326	1,381	1,416	1,507	1,598	1,663	1,725
Canary Islands	1,691	1,634	1,689	1,798	1,913	1,926	2,006	2,259	2,197	2,231
Cataluña	1,255	1,325	1,326	1,345	1,420	1,568	1,653	1,772	1,808	1,815
Valencian Community	1,259	1,299	1,346	1,396	1,450	1,526	1,651	1,838	1,942	2,035
Galicia	1,474	1,525	1,591	1,606	1,682	1,818	2,026	2,189	2,231	2,345
Navarra	1,952	2,038	2,052	2,141	2,275	2,404	2,515	2,621	2,791	2,865
Basque country	1,815	2,014	2,015	2,139	2,269	2,432	2,642	2,997	2,983	3,200
Rest of CCAA	1,446	1,463	1,435	1,514	1,567	1,602	1,710	1,919	2,071	2,089

Table 3: Public expenditure on university education (thousands euros)										
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
TOTAL	**3.084.794**	**3.339.655**	**3.480.047**	**3.844.929**	**4.235.272**	**4.758.480**	**4.836.156**	**5.124.665**	**5.569.937**	**6.025.913**
Ministry of Education and regional governments (CCAA) with an education department	**3.052.222**	**3.300.594**	**3.435.486**	**3.793.092**	**4.206.984**	**4.728.297**	**4.805.161**	**5.089.476**	**5.536.313**	**5.984.635**
Ministry of Education	1.269.500	1.364.820	1.384.489	1.485.989	202.545	130.474	130.474	147.314	154.351	182.594
Andalusia	472.835	511.029	576.072	631.225	672.265	690.480	754.785	781.701	867.180	928.444
Aragón	-	-	-	-	124.077	127.805	136.203	140.631	163.474	166.985
Asturias	-	-	-	-	118.773	139.212	139.301	139.301	154.874	156.215
Balearic Islands	-	-	-	-	-	48.912	48.183	46.019	49.318	60.955
Canary Islands	158.592	157.439	158.203	158.367	164.802	168.711	185.599	192.498	205.499	225.168
Cantabria	-	-	-	-	53.310	62.989	57.282	63.226	70.216	66.621
Castilla y León	-	-	-	-	274.394	307.605	336.144	364.263	395.040	383.586
Castilla-La Mancha	-	-	-	-	64.353	79.022	94.872	87.063	121.406	135.522
Catalunya	550.428	596.387	614.209	679.909	744.361	757.341	749.228	792.636	852.804	913.284
Valencian Community	258.367	286.338	290.805	385.088	448.267	636.404	595.447	597.981	623.234	690.803
Extremadura	-	-	-	-	61.692	67.971	81.431	83.414	96.005	96.984
Galicia	154.846	186.695	207.853	240.835	271.880	259.200	285.254	335.245	347.672	354.886
Madrid	-	-	-	-	678.898	875.798	819.198	872.267	956.071	1.129.019
Murcia	-	-	-	-	85.138	95.902	110.940	138.249	151.311	160.954
Navarra	40.407	34.962	30.708	31.616	36.615	42.207	43.710	50.327	57.971	53.369
Basque Country	147.247	162.924	173.147	180.063	188.554	216.504	209.590	226.838	237.527	253.476
La Rioja	-	-	-	-	17.060	21.760	27.520	30.503	32.360	25.770
Other public administrations	**30.132**	**28.377**	**33.780**	**34.943**	**28.288**	**30.183**	**30.995**	**35.468**	**34.261**	**41.785**

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Andalusia	2,416	2,263	2,281	2,217	2,182	2,158	2,282	2,337	2,565	2,690
Canary Islands	4,159	3,588	3,319	2,948	2,933	2,820	3,038	3,076	3,287	3,527
Cataluña	3,283	3,238	3,121	3,289	3,394	3,450	3,335	3,447	3,651	3,849
Valencian Community	2,236	2,260	2,088	2,547	2,788	3,813	3,350	3,307	3,481	3,747
Galicia	2,114	2,249	2,181	2,288	2,430	2,171	2,343	2,699	2,822	2,829
Navarra	5,884	4,149	3,135	2,868	3,222	3,245	3,303	4,039	4,581	4,643
Basque country	2,604	2,716	2,660	2,538	2,471	2,869	2,723	3,000	3,202	3,440
Rest of CCAA	2,188	2,112	2,019	2,027	2,108	2,373	2,386	2,490	2,818	3,038

Table 4: Deflated public expenditure on university education (in per capita terms)

Variable	Equation	Definition
Male	1, 2	Dummy variable indicating the individual is male
Age		
14-20	1, 2	Years when starting search (job): 14-20
20-25	1, 2	Years when starting search (job): 20-25
25-30	1, 2	Years when starting search (job): 25-30
30-35	1, 2	Years when starting search (job): 30-35
Educational Level		
Illiteracy	1, 2	Dummy variable indicating the individual has no estudies
Primary Ed.	1, 2	Dummy variable indicating the individual has primary education
Secondary Ed. (1st Stage)	1, 2	Dummy variable indicating the individual has 1st Stage secondary education
Secondary Ed. (2nd Stage)	1, 2	Dummy variable indicating the individual has 2nd Stage secondary education
"Form. Profesional" (1st Stage)	1, 2	Dummy variable indicating the individual has 1st Stage "formación profesional"
"Form. Profesional" (2nd Stage)	1, 2	Dummy variable indicating the individual has 2nd Stage "formación profesional"
Short	1, 2	Dummy variable indicating the individual has three years of university education
Long	1, 2	Dummy variable indicating the individual has more than three years of university education
Educational Expenditure		
University Education	1, 2	Average public expenditure (per capita) in university education of the 3 years before leaving the educational system
Non-University Education	1, 2	Average public expenditure (per capita) in non-university education of the 3 years before leaving the educational system
Region		
North-West	1, 2	Dummy variable for the North-West region
North-East	1, 2	Dummy variable for the North-East region
Middle	1, 2	Dummy variable for the Middle region
South-West	1, 2	Dummy variable for the South-West region
South-East	1, 2	Dummy variable for the South-East region
Year		
Y93-Y03	1, 2	Yearly dummy variables
Permanent Contract	2	Dummy variable indicating a permanent contract
Sector		
A0-A9	2	Sectorial dummy variables
Type of Job Match		
Over-educated	2	Dummy variable indicating the individual is over-educated
Adeq. Educated	2	Dummy variable indicating the individual is adequately educated
Under-educated	2	Dummy variabel indicating the individual is under-educated
Business Cycle		
Growth	1, 2	$(Employed_{t,j} - Employed_{t-1,j}) / Employed_{t-1,j}$
Employment Rate	1, 2	Employed/People older than 16
Quarter		
Q1-Q4	1, 2	Quarterly dummy variables
Competences	1, 2	Dummy variable indicating the region had competences in university/non-university education in the 3 years before the individual left the school

Equation (1) : Unemployment hazard rate
Equation (2) : Employment hazard rate

	Unemployment				Employment			
	t_u (uncensored) (N=4,038)		t_u (censored) (N=1,686)		t_e (uncensored) (N=893)		t_e (censored) (N=1,785)	
	Mean	*Std. Dev*	*Mean*	*Std. Dev*	*Mean*	*Std. Dev*	*Mean*	*Std. Dev*
t_u	12,300	10,207	27,912	13,431	13,676	12,233	12,854	10,931
t_e					3,856	3,378	13,573	7,134
Male	0,491	0,500	0,327	0,469	0,451	0,498	0,514	0,500
Age								
14-20	0,398	0,489	0,377	0,485	0,302	0,460	0,253	0,435
20-25	0,451	0,498	0,437	0,496	0,467	0,499	0,458	0,498
25-30	0,133	0,339	0,145	0,353	0,231	0,422	0,289	0,453
30-35	0,018	0,133	0,041	0,198				
Educational Level								
Illiteracy	0,000	0,022	0,001	0,034	0,076	0,265	0,041	0,199
Primary Education	0,051	0,219	0,081	0,273				
Secondary Education	0,474	0,499	0,454	0,498	0,458	0,499	0,422	0,494
"Formación Profesional"	0,176	0,381	0,190	0,393	0,200	0,401	0,190	0,393
University Education	0,300	0,458	0,273	0,446	0,265	0,442	0,346	0,476
Educational Expenditure								
Non-university education	1,662	0,290	1,516	0,214	1,584	0,248	1,658	0,291
University education	2,560	0,477	2,348	0,386	2,463	0,457	2,544	0,471
Region[17]								
North-West	0,115	0,319	0,197	0,398	0,123	0,329	0,136	0,343
North_East	0,243	0,429	0,148	0,355	0,214	0,410	0,243	0,429
Middle	0,240	0,427	0,238	0,426	0,221	0,415	0,259	0,438
South-West	0,269	0,444	0,337	0,473	0,315	0,465	0,237	0,425
South-East	0,133	0,340	0,080	0,271	0,128	0,334	0,124	0,330
Permanent Contract					0,049	0,217	0,273	0,446
Type of Job Match								
Over-educated					0,097	0,297	0,109	0,311
Adeq. Educated					0,761	0,426	0,789	0,408
Under-educated					0,141	0,348	0,102	0,303
Business Cycle								
Growth	0,043	0,023	0,029	0,027	0,042	0,023	0,045	0,021
Employment Rate	0,430	0,051	0,390	0,043	0,429	0,047	0,446	0,049
Quarter								
Q1	0,239	0,427	0,364	0,481	0,234	0,424	0,237	0,425
Q2	0,230	0,421	0,176	0,381	0,246	0,431	0,214	0,411
Q3	0,282	0,450	0,308	0,462	0,274	0,446	0,281	0,449
Q4	0,249	0,432	0,153	0,360	0,245	0,430	0,268	0,443
Competences								
Non-university education	0,575	0,494	0,538	0,499	0,587	0,493	0,539	0,499
University education	0,786	0,410	0,608	0,488	0,670	0,471	0,760	0,427
Educational expenditure & competences								
Non-university education	0,974	0,882	0,815	0,782	0,940	0,824	0,915	0,889
University education	2,105	1,177	1,530	1,271	1,763	1,298	2,035	1,214

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[17] *North-West:* Galicia, Asturias, Cantabria; *North-East*: Cataluña, Aragón, Navarra, País Vasco; *Middle*: Castilla-León, Castilla La Mancha, Madrid; *South-West*: Extremadura, Andalucía, Canarias; *South-East*: Comunidad Valenciana, Murcia, Baleares.

Table 7: Mean Unemployment and Employment Durations

		Unemployment			Employment		
		Mean	*Std.Deviation*	*N*	*Mean*	*Std.Deviation*	*N*
	North-West						
	t (i)	31.796	15.154	529	11.285	7.265	280
	t (c)	17.135	15.049	538	3.573	3.038	143
	North_East						
	t (i)	28799	14.691	492	13.948	7.225	484
	t (c)	11.921	9.836	1102	3.858	3.671	239
	Middle						
REGION	t (i)	29.622	13.870	682	12.401	7.179	536
	t (c)	14.458	12.642	1100	3.457	2.717	236
	South-West						
	t (i)	30.223	14.691	962	11.936	7.161	486
	t (c)	14.887	12.895	1240	3.631	3.199	342
	South-East						
	t (i)	27.553	13.324	262	13.529	7.052	255
	t (c)	12.226	11.159	618	3.683	3.305	139
	Male						
	t (i)	29.284	14.187	946	13.723	6.991	1038
GENDER	t (c)	12.678	11.347	2242	3.788	3.287	501
	Female						
	t (i)	30.178	14.657	1981	11.529	7.319	1003
	t (c)	15.217	13.096	2356	3.520	3.130	598
	Primary Ed.						
	t (i)	31.861	14.879	287	12.325	6.602	89
	t (c)	14.542	12.861	262	3.385	2.881	96
	Secondary Ed.						
	t (i)	29.646	14.685	1301	12.545	7.362	866
EDUC. LEVEL	t (c)	13.780	12.144	2168	3.536	3.217	507
	Form. Profesional						
	t (i)	30.053	14.683	599	12.190	7.194	399
	t (c)	14.937	13.472	840	4.000	3.411	222
	University Ed.						
	t (i)	29.417	13.867	740	13.077	7.171	687
	t (c)	13.587	11.764	1328	3.638	3.106	274
	1993						
	t (i)	33.512	15.974	642	5.993	3.752	140
	t (c)	26.796	17.606	290	2.772	2.111	101
	1994						
	t (i)	31.569	14.846	599	6.405	3.980	116
	t (c)	25.529	18.608	270	2.667	2.027	105
	1995						
	t (i)	30.953	14.988	513	5.932	3.925	147
	t (c)	23.117	16.951	316	2.902	2.035	112
	1996						
	t (i)	28.032	13.159	433	6.630	4.373	154
	t (c)	21.389	14.421	342	3.207	2.420	130
	1997						
	t (i)	27.670	13.940	285	8.040	4.794	172
DATE ENTRY	t (c)	17.706	12.603	310	2.480	1.844	102
	1998						
	t (i)	28.184	11.797	195	14.700	6.866	394
	t (c)	10.796	7.710	919	5.346	4.263	358
	1999						
	t (i)	23.753	9.094	134	16.486	6.089	409
	t (c)	9.743	6.142	934	2.938	2.175	81
	2000						
	t (i)	20.988	6.597	83	17.016	5.850	367
	t (c)	8.934	4.486	856	2.724	1.862	69
	2001						
	t (i)	17.512	5.153	41	15.298	6.268	141
	t (c)	7.988	3.670	350	2.8	2.069	35
	2002						
	t (i)	9.000	9.899	2	14	.	1
	t (c)	3.364	3.828	11	1.667	0.817	6

i: incomplete duration
c: complete duration

Table 8: Unemployment and employment hazard rates. University education								
	Separate Estimations				Simultaneous Estimation with unobserved heterogeneity			
	Unemployment		Employment		Unemployment		Employment	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t
$Ln(t_u)$	-0,174	-0,57	0,065	0,72	-0,432	-1,37	0,072	0,78
$Ln(t_u)^2$	0,754	4,19			0,938	4,94		
$Ln(t_u)^3$	-0,197	-6,35			-0,225	-6,92		
$Ln(t_e)$			-0,717	-8,59			-0,697	-8,21
Male	0,285	4,55	-0,229	-1,52	0,324	4,57	-0,226	-1,46
Age[18]								
15-20	-	-	-	-	-	-	-	-
20-25	0,070	0,50	-	-	-0,003	-0,02	-	-
25-35	0,028	0,20	0,115	0,76	-0,042	-0,26	0,117	0,75
Educational Level								
Short	-	-	-	-	-	-	-	-
Long	-0,015	-0,25	-0,497	-3,41	0,024	0,34	-0,508	-3,38
Expenditure[19]	0,196	1,69	0,356	1,29	0,172	1,31	0,352	1,25
Region								
North-West	-0,300	-2,60	-0,140	-0,51	-0,324	-2,51	-0,128	-0,45
North_East	-0,032	-0,30	-0,209	-0,77	-0,076	-0,62	-0,210	-0,76
Middle	-	-	-	-	-	-	-	-
South-West	0,050	0,42	0,328	1,20	0,100	0,74	0,338	1,2
South-East	0,243	2,04	0,033	0,13	0,314	2,34	0,037	0,14
Permanent Contract			-2,414	-6,61			-2,444	-6,66
Type of Job Match								
Over-educated			0,186	1,17			0,176	1,08
Adeq. Educated			-	-			-	-
Under-educated			0,264	0,47			0,233	0,40
Business Cycle								
Employment Rate	4,379	3,24	-3,269	-1,05	5,426	3,53	-3,308	-1,02
Growth	-0,837	-0,43	-1,875	-0,44	-1,103	-0,55	-1,736	-0,4
Quarter								
Q1	-0,568	-6,13	0,077	0,37	-0,631	-6,48	0,082	0,39
Q2	-0,297	-3,47	0,203	1,01	-0,343	-3,9	0,208	1,02
Q3	-0,047	-0,58	0,302	1,59	-0,076	-0,91	0,310	1,62
Q4	-	-	-	-	-	-	-	-
Competences[20]	-0,108	-1,08	-0,436	-2,03	-0,132	-1,18	-0,437	-1,97
Constant	-7,223	-12,60	-1,385	-1,09	-7,581	-12,14	-1,467	-1,12
Pr					0,912	20,86	0,912	20,86
η					0,175	1,78	0,175	1,78
N	27210		9461		36671			
Log likelihood	-4482		-906		-5385			

Yearly dummies included in unemployment and employment equations.

Sector dummies included in employment equation

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[18] Age at time when starting to search

[19] Public expenditure in education (average of the 3 years before finishing education)

[20] The region (CCAA) had an educational department during the 3 years before finishing education

Table 8': Unemployment and employment hazard rates. University education

| | Separate Estimations | | | | Simultaneous Estimation with unobserved heterogeneity | | | |
| | Unemployment | | Employment | | Unemployment | | Employment | |
	Coef.	t	Coef.	t	Coef.	t	Coef.	t
$Ln(t_u)$	-0,164	-0,54	0,058	0,62	-0,459	-1,45	0,065	0,68
$Ln(t_u)^2$	0,746	4,14			0,955	4,99		
$Ln(t_u)^3$	-0,195	-6,28			-0,226	-6,91		
$Ln(t_e)$			-0,718	-8,60			-0,695	-8,15
Male	0,283	4,52	-0,229	-1,52	0,332	4,58	-0,226	-1,45
Age[21]								
15-20								
20-25	0,072	0,51			0,005	0,03		
25-35	0,030	0,22	0,113	0,75	-0,027	-0,17	0,116	0,74
Educational Level								
Short								
Long	-0,009	-0,14	-0,499	-3,42	0,034	0,47	-0,512	-3,39
Expenditure[22]	1,911	1,64	-0,319	-0,14	3,336	2,36	-0,455	-0,19
Region								
North-West	-0,321	-2,76	-0,133	-0,48	-0,372	-2,76	-0,119	-0,42
North_East	-0,037	-0,34	-0,207	-0,77	-0,098	-0,79	-0,208	-0,75
Middle								
South-West	0,031	0,25	0,335	1,21	0,056	0,40	0,349	1,22
South-East	0,224	1,87	0,041	0,15	0,275	2,01	0,046	0,17
Permanent Contract			-2,414	-6,61			-2,448	-6,67
Type of Job Match								
Over-educated			0,182	1,14			0,172	1,04
Adeq. Educated								
Under-educated			0,249	0,44			0,210	0,36
Business Cycle								
Employment Rate	4,196	3,10	-3,219	-1,03	5,183	3,34	-3,244	-1,00
Growth	-0,953	-0,49	-1,743	-0,41	-1,285	-0,63	-1,572	-0,36
Quarter								
Q1	-0,564	-6,09	0,073	0,35	-0,635	-6,49	0,078	0,37
Q2	-0,294	-3,44	0,200	0,99	-0,346	-3,93	0,205	1,01
Q3	-0,046	-0,56	0,301	1,58	-0,078	-0,93	0,310	1,61
Q4								
Competences[23]	3,528	1,43	-1,876	-0,38	6,558	2,20	-2,159	-0,41
*Expenditure*Competences*	-1,707	-1,48	0,676	0,29	-3,152	-2,25	0,808	0,33
Constant	-10,780	-4,37	0,035	0,01	-14,181	-4,73	0,213	0,04
Pr					0,897	18.87	0,897	18.87
η					0,205	1.93	0,205	1.93
N	27210		9461		36671			
Log likelihood	-4481		-906		-5382			

Yearly dummies included in unemployment and employment equations.

Sector dummies included in employment equation

[21] Age at time when starting to search

[22] Public expenditure in university education (average of the 3 years before finishing education)

[23] The region (CCAA) had an educational department with competences in university education during the 3 years before finishing education

Table 9: Unemployment and employment hazard rates. Non-University education								
	Separate Estimations				**Simultaneous Estimation with unobserved heterogeneity**			
	Unemployment		**Employment**		**Unemployment**		**Employment**	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t
$Ln(t_u)$	-0,910	-4,91	0,153	2,99	-1,23	-6,30	0,17	3,16
$Ln(t_u)^2$	1,178	10,49			1,40	11,56		
$Ln(t_u)^3$	-0,263	-13,47			-0,30	-14,27		
$Ln(t_e)$			-0,639	-12,66			-0,61	-11,77
Male	0,479	11,93	-0,297	-3,15	0,55	12,01	-0,31	-3,14
Age								
14-20	-	-	-	-	-	-	-	-
20-25	-0,097	-2,03	0,092	0,91	-0,07	-1,28	0,10	0,98
25-30	-0,133	-1,7	-0,034	-0,22	-0,10	-1,20	-0,02	-0,11
30-35	-0,251	-1,75			-0,21	-1,34		
Educational level								
Primary Ed.	-0,340	-4,07	0,542	2,43	-0,38	-4,13	0,53	2,30
Secondary Ed. (1st Stage)	-0,246	-4,71	0,131	1,11	-0,21	-3,52	0,12	0,98
Secondary Ed. (2nd Stage)	-	-	-	-	-	-	-	-
Form. Profesional (1st Stage)	-0,060	-0,67	0,112	0,67	-0,06	-0,61	0,10	0,55
Form. Profesional (2nd Stage)	0,116	2,01	-0,142	-1,11	0,13	1,99	-0,16	-1,22
Expenditure[24]								
Expenditure	7,207	1,36	0,147	0,73	13,13	2,30	0,19	0,89
Expenditure^2	-3,540	-1,32			-6,55	-2,25		
Expenditure^3	0,560	1,26			1,05	2,18		
Region								
North-West	-0,207	-2,46	-0,147	-0,85	-0,27	-2,88	-0,19	-1,05
North_East	0,213	2,65	0,070	0,43	0,23	2,56	0,09	0,53
Middle	-	-	-	-	-	-	-	-
South-West	0,081	0,91	0,049	0,28	0,07	0,74	0,00	0,02
South-East	0,247	3,06	0,159	0,91	0,23	2,55	0,17	0,93
Permanent Contract			-1,635	-9,3			-1,66	-9,40
Type of Job Match								
Over-educated			0,599	1,65			0,61	1,63
Adeq. Educated			-	-			-	-
Under-educated			-0,163	-1,05			-0,17	-1,05
Business Cycle								
Employment Rate	3,168	3,74	-3,029	-2,20	3,11	3,13	-3,96	-2,27
Growth	-0,560	-0,46	-0,972	-0,38	-0,51	-0,41	-0,78	-0,30
Quarter								
Q1	-0,244	-4,01	-0,058	-0,45	-0,32	-5,01	-0,06	-0,47
Q2	0,026	0,45	0,095	0,78	-0,02	-0,42	0,09	0,75
Q3	0,206	3,66	0,367	3,24	0,19	3,26	0,37	3,21
Q4	-	-	-	-	-	-	-	-
Competences[25]	-0,085	-1,34	0,280	2,41	-0,06	-0,91	0,31	2,53
Constant	-11,058	-3,32	-1,108	-1,68	-14,93	-4,19	-0,93	-1,21
Pr					0,935	44,42	0,935	44,42
η					0,198	2,37	0,198	2,37
N	69413		18209		87622			
Log likelihood	-10560		-2382		-12919			

Yearly dummies included in unemployment and employment equations.
Sector dummies included in employment equation

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[24] Public expenditure in non-university education (average of the 3 years before finishing education)

[25] The region (CCAA) had an educational department with competences in non-university education during the 3 years before finishing education

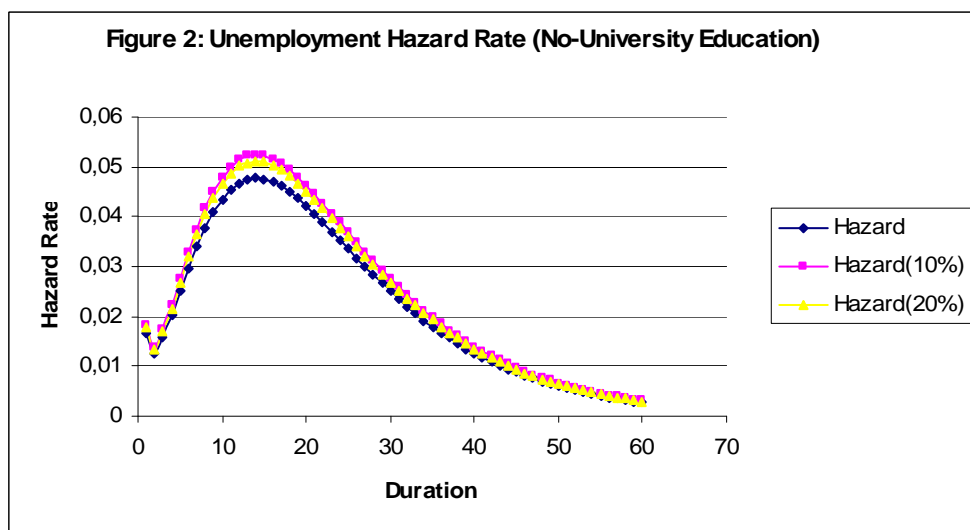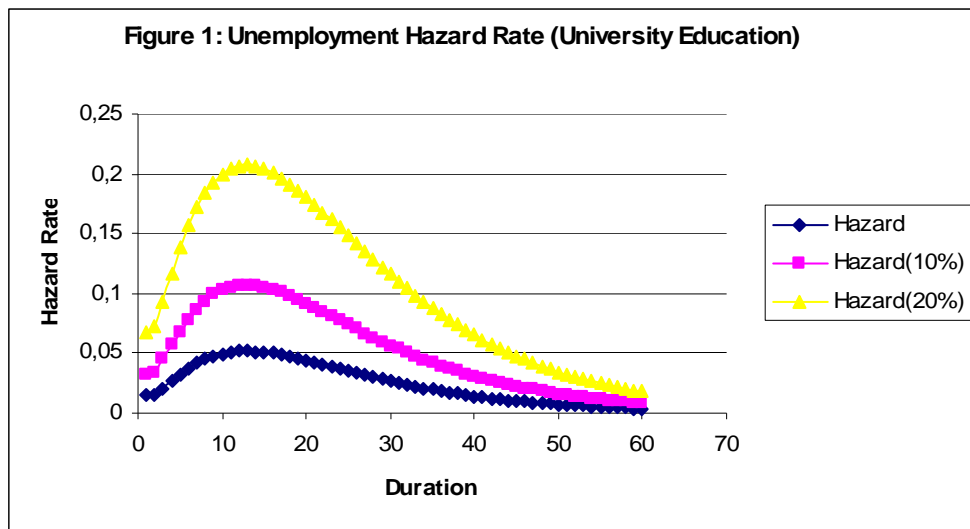| Table 9': Unemployment and employment hazard rates. Non-University education								
	Separate Estimations				*Simultaneous Estimation with unobserved heterogeneity*			
	Unemployment		**Employment**		**Unemployment**		**Employment**	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t
$Ln(t_u)$	-0,909	-4,91	0,128	2,44	-1,228	-6,30	0,142	2,60
$Ln(t_u)^2$	1,178	10,49			1,401	11,55		
$Ln(t_u)^3$	-0,263	-13,46			-0,295	-14,26		
$Ln(t_e)$			-0,647	-12,79			-0,620	-11,90
Male	0,479	11,93	-0,296	-3,14	0,548	12,01	-0,308	-3,15
Age								
14-20	-	-	-	-	-	-	-	-
20-25	-0,097	-2,03	0,079	0,78	-0,067	-1,28	0,090	0,86
25-30	-0,133	-1,70	-0,051	-0,33	-0,103	-1,20	-0,035	-0,22
30-35	-0,251	-1,75			-0,214	-1,34		
Educational level								
Primary Ed.	-0,340	-4,07	0,540	2,41	-0,381	-4,12	0,533	2,29
Secondary Ed. (1st Stage)	-0,246	-4,71	0,128	1,08	-0,212	-3,52	0,116	0,94
Secondary Ed. (2nd Stage)	-	-	-	-	-	-	-	-
Form. Profesional (1st Stage)	-0,060	-0,67	0,102	0,61	-0,060	-0,61	0,084	0,48
Form. Profesional (2nd Stage)	0,116	2,01	-0,138	-1,08	0,128	1,99	-0,159	-1,20
Expenditure[26]								
Expenditure	7,351	1,33	-1,301	-1,59	13,145	2,24	-1,257	-1,49
Expenditure^2	-3,602	-1,30			-6,557	-2,21		
Expenditure^3	0,571	1,24			1,055	2,13		
Region								
North-West	-0,206	-2,45	-0,162	-0,93	-0,270	-2,86	-0,206	-1,13
North_East	0,212	2,64	0,077	0,47	0,229	2,56	0,094	0,55
Middle	-	-	-	-	-	-	-	-
South-West	0,081	0,92	0,035	0,19	0,073	0,73	-0,010	-0,05
South-East	0,247	3,06	0,169	0,97	0,233	2,55	0,174	0,96
Permanent Contract			-1,637	-9,32			-1,668	-9,41
Type of Job Match								
Over-educated			0,647	1,78			0,659	1,74
Adeq. Educated			-	-			-	-
Under-educated			-0,155	-0,99			-0,161	-1,00
Business Cycle								
Employment Rate	3,176	3,73	-3,285	-2,35	3,110	3,11	-4,161	-2,34
Growth	-0,563	-0,46	-0,917	-0,36	-0,514	-0,41	-0,716	-0,27
Quarter								
Q1	-0,244	-3,95	-0,078	-0,60	-0,317	-4,95	-0,081	-0,62
Q2	0,026	0,45	0,081	0,67	-0,025	-0,42	0,077	0,63
Q3	0,206	3,66	0,360	3,17	0,186	3,26	0,360	3,14
Q4	-	-	-	-	-	-	-	-
Competences[27]	-0,038	-0,07	-2,006	-1,60	-0,059	-0,10	-1,968	-1,52
*Expenditure*Competences*	-0,029	-0,09	1,463	1,82	-0,003	-0,01	1,456	1,77
Constant	-11,176	-3,12	1,255	0,87	-14,942	-3,96	1,405	0,92
Pr					0,935	44,43	0,935	44,43
η					0,197	2,35	0,197	2,35
N	69413		18209		87622			
Log likelihood	-10560		-2380		-12917			

Yearly dummies included in unemployment and employment equations.

Sector dummies included in employment equation

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[26] Public expenditure in non-university education (average of the 3 years before finishing education)

[27] The region (CCAA) had an educational department with competences in non-university education during the 3 years before finishing education

Figures[28]

Figure 1: Unemployment Hazard Rate (University Education)

Figure 2: Unemployment Hazard Rate (No-University Education)

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[28] The figures present the variations in the unemployment and employment hazard rates, for the subsamples of people with university and non-university education, when we simulate increases of 10% and 20% in regional public expenditure in education.

Figure 3: Employment Hazard Rate (University Education)

Figure 4: Employment Hazard Rate (Non-University Education)

Figure 4 a): Employment Hazard Rate (Non-University Education)
Regions *with* educational department

Figure 4 b): Employment Hazard Rate (Non-University Education)
Regions *without* educational department