DECENTRALIZATION AND EFFICIENCY IN THE SPANISH EDUCATION SYSTEM: AN ANALYSIS OF SCHOOL TO WORK TRANSITIONS

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Abstract

In this paper we study whether decentralization has yield to efficiencies in the management of the educational system, where efficiency refers to improvements in the school-to-work transition process. For that purpose, we use individual data from the Spanish Labor Force Survey for the period 1993-2002, and we concentrate on labor market outcomes of school leavers. In particular, we estimate a simultaneous equation model for the exit rates from both unemployment and employment, including 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 provide evidence of a positive and significant effect of the decentralization process, both in university and non-university education, on the probability of finding a first job after completing education. This would suggest that the decentralization in educational governance has yield some efficiency gains in Spain.

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Keywords: educational expenditure, decentralization, school-to-work transitions, unemployment hazard, employment hazard

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1. Introduction

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 Rondinelli, 1983).

Efficiency gains derived from decentralization of the educational system may also refer to improvements in the school-to-work process. 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. [2]

As in almost all OECD countries 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. In order to examine to what extent these two factors have positively influenced the transition from school to work, we estimate a simultaneous equation model for the unemployment and employment hazard rates of the school leavers. 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 show that having decision-making authority over both university and non-university education at the regional level has produced positive labour market outcomes. In particular, we find that, all else equal, devoting higher amounts of funds to education, both university and non-university students significantly increases the probability of finding a first job after completing education in those regions with competences since the beginning of the 1990s. However, this is not the case for those regions where decision making authority was transferred later. These differences can be explained in the following way. To the extent that decentralization shortens the distance between the policymakers and the school, and makes it easier to translate policy and program objectives into the necessary resources and capacities,

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

more efficient quantity and quality levels of education are expected in the former regions. These more efficient outcomes may obviously be translated in a more successful school-to-work transition process, thus resulting in higher employment probabilities for school-leavers. In this sense, it can be said that decentralization in educational governance has yield efficiency gains.

The paper is organized as follows. Next section provides an overview on school-to-work transitions. Section 3 focuses on the decentralization process experienced by the Spanish educational system. Section 4 describes the empirical approach to estimate the hazard rates. Section 5 describes de data and presents the estimation sample together with a descriptive analysis. Section 6 contains the main results, and 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. [3]. 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.

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[3] As pointed out by Dolado et. Al, (2000), the proportion of people with higher educational levels in Spain was in 2000 about 75 per cent of the OECD average.

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 exit rates from unemployment and employment In Spain 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 regional governments' decisions affect 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 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[4]. And in 1996 educational expenditures represented more than 5 percent of the Spanish 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

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

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 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 important 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[5] 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

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[5] 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.

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:

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

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 also 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:

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

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

$$\tag{6}$$

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:

$$\ln L = \sum_{i=1}^{N} \ln \int L_i(\eta) dF(\eta) \tag{7}$$

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

5.   Data and descriptive analysis

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.[6]

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.[7] In particular we select data on public expenditure on university and non-university education at the regional level (*Autonomous Communities*).[8] As we are interested on the effect of both public expenditure and education decentralization on 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 one assigned by the *National Ministry of Education*. Thus, 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,

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[6] We censor the maximum unemployment duration to 60 months.
[7] Source: www.mec.es/mecd/estadisticas/index
[8] The series of public expenditure on education are deflated using the *National Price Index (base year 1992)*. See Tables 1-4 in the Appendix.

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.[9] 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.[10]

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.[11] As expected, the numbers corresponding to public expenditure in university education are above the ones corresponding to non-university 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.

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[9] The study could be extended to include more recent data. Nonetheless, we are interested in the effect of decentralization and regional differences in this respect on the school-to-work process. Since in 2000 all regions already had the competences in education, including more recent years would not be expected to change our results.

[10] 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*.

[11] 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.

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.[12] 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, a variable measuring the local employment growth, and a variable measuring the local GDP growth.

Apart from the variables included as explanatory factors in the unemployment hazard rate,[13] 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 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

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[12] Alternative estimations are also done including an interaction of these two variables.
[13] The age variable in the employment equation refers to the one when starting the job.

under-educated if his/her educational attainments are below the mean education of the corresponding occupation minus one standard deviation.[14]

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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[14] 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

We will estimate our model separately for two levels of education (those with an University degree and those with no University degree). Table 8 reports the estimation results for the subsample of people with university education.[15] The results for the set of controls are quite standard. Male exits earlier from unemployment and suffer a lower employment hazard rate 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. 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 log of such duration in the employment hazard rate. With respect to the unemployment hazard rate, we find the usual decreasing pattern once duration in unemployment is larger. We also find a negative effect over such hazard rate of the rate of employment growth. This could be due to a lower acceptance probability of these unemployed when the labor market is perceived to be in a better situation.

The coefficients which raise most interest are the one associated with the variables: public expenditure in university education ("*Expenditure*"), competences in education during the 3 years before finishing education ("*Competences*"), and the interaction of the previous two variables ("*Expenditure*Competences*"). The results reported in Table 8 show a negative and significant effect of the first two variables on the unemployment hazard rate, while a positive and significant effect of the later. These estimation results reveal significant differences between those regions with and without decision-making authority over education. In particular, for those regions with competences in university education, the odd ratio of the variable *"Expenditure"* is 1.356, while for those without these competences transferred it is found to be

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0.421.[16] Thus, public expenditure on university education seems to increase the probability of finding a first job after completing schooling only in those regions where educational spending responsibilities were under control of the regional governments. Finally, we do not observe significant effects of decentralization and public expenditure on education over the probability of leaving employment.[17]

For a better illustration of these differences between those regions with and without competences in education, Figures 1a) and 1b) show the variation in unemployment hazard rates, derived from simulated increases of 10% and 20% in regional public expenditure on university education. As it can be observed, significant differences appear between those regions with and without decision making authority over education. While in the formers unemployment hazard rates seem to significantly increase due to increases in public expenditure on education, the opposite occurs for those regions without competences in education. This result can also be observed in Table 10 that summarizes the simulation results for unemployment durations of 1, 6, 12, 18 and 24 months. Thus, Government's efforts in terms of university education seems contributing to the success in the transition process from school to work, and in this sense, it can be said that it has yield to considerable efficiencies in the management of university education.

The estimation results corresponding to the subsample of people with non-university education are reported in Tables 9.[18] In the search equation, unemployment duration-dependence has been taken into account through the inclusion of a two-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

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[16] 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.
[17] 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.
[18] In Table 9' we have added as an additional explanatory factor an interaction for the variables *"Expenditure"* and *"Competences"* referred to non-university education.

only for those regions with competences in education. This result is clearly observed when we simulate increases of 10% and 20% in regional public expenditure on non-university education (see Figures 2 a), and 2 b)).[19] As it occurred with university education, decentralization of non-university education seems to have yield to efficiency gains in terms of positive labor market outcomes of school-leavers.

Regarding non-university education several points are also worth mentioning. 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. Our results also reveal that over-educated workers are more likely to leave the first job than those correctly allocated.

Finally, the same simulation exercises are done for the employment hazard rates (see Figures 3a) – 4 b)). However, in this case increasing public expenditure in education does not seem to affect the probability of leaving the first job, either for regions with or without competences in education.

7.   Concluding Remarks

There are several reasons why a decentralized educational system may induce a higher level of efficiency than a centralized one. First, people can consume the optimal quantity and quality of education. Second, people may induce the local provider of services to deliver the preferred amount, while in a centralized system it is more difficult that citizens make their

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[19] In Table 11 we summarize these simulation results for unemployment durations of 1, 6, 12, 18 and 24 months.

preferences known to politicians. Finally, decentralization makes it easier to translate policy and program objectives into the necessary resources and capacities.

Efficiency may refer to improving educational quantity and quality but also improving the labor market outcomes of school-leavers over the school-to-work transition period. This paper is intended to analyze how devolution of decision-making authority over education has affected the transition process from school to work, in terms of both unemployment and employment hazard rates. This is a question of political relevance in Spain, where 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 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 each individual in the sample leave 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. We find that devoting higher amounts of funds to education, both university and non-university, in those regions with competences since the beginning of the 1990s significantly increases the probability of finding a first job after completing education. However, this is not the case for those regions where decision making authority was transferred later. These findings would suggest that the decentralization in educational governance has yield efficiency gains.

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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
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
Aragon	258.022	295.452	316.384	318.700	342.196	371.303	402.885	437.154	488.943	519.099
Asturias	270.581	292.302	307.649	318.198	339.261	358.267	378.339	399.535	421.918	457.065
Balearic Islands	144.980	168.514	176.431	183.848	201.098	225.207	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	120.754	140.619	150.056	151.390	162.180	178.193	195.788	215.120	235.024	234.501
Castilla y León	616.925	693.038	749.774	755.460	811.756	869.955	932.325	999.168	1.070.803	1.159.332
Castilla-La Mancha	415.550	448.477	483.230	495.209	539.077	589.530	644.706	705.045	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	260.318	283.189	310.051	324.030	347.971	375.667	405.567	437.846	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	1.343.824	1.195.549	1.295.836	1.271.911	1.357.394	1.514.783	1.690.422	1.886.426	1.879.998	2.068.492
Murcia	273.208	301.192	323.159	334.624	365.897	405.750	449.943	498.950	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	59.030	68.471	76.265	75.458	83.858	88.662	93.742	99.112	117.264	127.920

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	1,282	1,275	1,316	1,370	1,405	1,495	1,585	1,650	1,711
Aragon	1,218	1,359	1,436	1,419	1,511	1,647	1,804	1,952	2,147	2,221
Asturias	1,306	1,377	1,449	1,488	1,599	1,729	1,885	2,034	2,177	2,384
Balearic Islands	1,000	1,107	1,116	1,117	1,182	1,292	1,427	1,764	1,825	2,000
Canary Islands	1,691	1,621	1,675	1,783	1,897	1,910	1,989	2,240	2,179	2,212
Cantabria	1,115	1,249	1,315	1,296	1,398	1,560	1,741	1,959	2,124	2,126
Castilla y León	1,284	1,397	1,491	1,474	1,577	1,720	1,881	2,036	2,174	2,329
Castilla-La Mancha	1,254	1,284	1,321	1,302	1,379	1,495	1,635	1,771	1,889	2,098
Catalunya	1,255	1,323	1,324	1,343	1,418	1,566	1,651	1,770	1,806	1,813
Valencian Community	1,259	1,297	1,344	1,393	1,448	1,524	1,649	1,835	1,939	2,032
Extremadura	1,203	1,238	1,302	1,298	1,351	1,454	1,575	1,702	1,815	2,152
Galicia	1,474	1,514	1,581	1,595	1,670	1,806	2,013	2,174	2,216	2,336
Madrid	1,287	1,107	1,168	1,123	1,180	1,324	1,489	1,657	1,622	1,710
Murcia	1,104	1,160	1,203	1,201	1,290	1,432	1,582	1,729	1,798	1,864
Navarra	1,952	2,021	2,035	2,123	2,256	2,383	2,494	2,598	2,767	2,840
Basque Country	1,815	2,012	2,012	2,136	2,266	2,428	2,639	2,993	2,978	3,195
La Rioja	1,158	1,296	1,419	1,378	1,521	1,630	1,739	1,828	2,118	2,239

Table 3: Public expenditure on university education (thousands euros)										
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Andalusia	470.798	485.534	549.075	620.183	665.263	687.229	749.869	764.360	851.796	910.271
Aragon	86.159	85.596	90.784	99.190	117.995	125.563	136.125	140.565	163.354	166.817
Asturias	70.989	76.496	81.534	95.662	117.781	131.615	125.728	125.728	154.838	155.502
Balearic Islands	28.439	30.905	32.269	28.746	35.431	48.003	48.183	46.019	49.318	60.829
Canary Islands	157.736	156.483	157.417	157.466	163.866	167.987	180.148	178.026	189.704	216.754
Cantabria	33.499	35.503	39.290	42.016	53.168	62.851	57.168	63.118	70.114	66.507
Castilla y León	177.224	186.073	197.597	213.719	272.348	304.479	334.360	351.778	391.506	381.507
Castilla-La Mancha	38.055	39.722	42.763	53.342	64.194	78.869	94.740	86.462	120.727	131.832
Catalunya	516.401	567.249	584.616	633.704	683.133	689.345	715.483	768.719	832.655	875.149
Valencian Community	257.916	285.043	290.220	382.823	440.625	490.090	500.150	563.164	575.285	637.554
Extremadura	43.641	39.678	39.178	45.320	61.676	67.949	81.410	83.404	95.975	96.941
Galicia	154.454	186.169	206.219	239.886	271.056	256.859	284.558	332.711	346.337	353.602
Madrid	558.416	594.838	601.794	654.862	676.046	867.684	813.278	860.860	944.763	1.077.392
Murcia	57.498	61.041	64.423	69.655	85.138	95.902	110.940	138.149	149.782	154.099
Navarra	40.407	34.932	30.559	31.486	36.542	42.076	43.620	50.219	57.935	53.363
Basque Country	147.247	162.756	168.300	176.214	188.428	216.504	208.611	226.503	237.429	253.387
La Rioja	8.241	8.262	10.801	11.802	17.051	21.696	27.454	30.425	32.024	25.500

Table 4: Deflated public expenditure on university education (in per capita terms)										
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Andalusia	2,406	2,131	2,158	2,161	2,142	2,131	2,249	2,267	2,499	2,649
Aragon	2,157	2,018	1,969	1,997	2,216	2,321	2,502	2,620	3,079	3,176
Asturias	1,936	1,885	1,824	2,006	2,341	2,520	2,353	2,369	3,044	3,061
Balearic Islands	2,341	2,366	2,281	1,825	2,157	2,624	2,615	2,566	3,136	3,314
Canary Islands	4,136	3,538	3,276	2,907	2,893	2,785	2,925	2,821	3,009	3,347
Cantabria	2,559	2,501	2,491	2,393	2,906	3,341	3,100	3,461	3,944	3,681
Castilla y León	2,123	2,009	1,956	1,952	2,335	2,553	2,800	2,890	3,304	3,239
Castilla-La Mancha	1,828	1,631	1,489	1,626	1,779	2,093	2,380	2,092	3,095	3,126
Catalunya	3,080	3,076	2,967	3,063	3,112	3,137	3,181	3,339	3,560	3,691
Valencian Community	2,232	2,246	2,080	2,527	2,736	2,931	2,809	3,110	3,208	3,542
Extremadura	2,199	1,798	1,597	1,663	2,075	2,167	2,446	2,385	2,628	2,548
Galicia	2,109	2,228	2,149	2,264	2,407	2,137	2,322	2,661	2,792	2,695
Madrid	1,746	1,640	1,612	1,674	1,564	1,947	1,836	1,894	2,113	2,307
Murcia	1,947	1,832	1,756	1,742	1,985	2,154	2,435	3,073	3,299	3,286
Navarra	5,884	4,111	3,094	2,832	3,189	3,208	3,269	3,997	4,539	4,399
Basque Country	2,604	2,709	2,583	2,481	2,466	2,865	2,706	2,991	3,196	3,396
La Rioja	1,951	1,706	2,019	1,643	2,087	2,476	3,041	3,301	3,407	2,773

Table 5: Variable Definition

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	$(\text{Employed}_{t,i}-\text{Employed}_{t-1,i})/\text{Employed}_{t-1,i}$
Employment Rate	1, 2	Employed/People older than 16
Growth (GDP)	1, 2	$(\text{GDP}_{t,i}-\text{GDP}_{t-1,i})/\text{GDP}_{t-1,i}$
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

Table 6: Descriptive Statistics

	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	1,609	0,322	1,452	0,244	1,527	0,276	1,597	0,327
University education	2,560	0,477	2,348	0,386	2,463	0,457	2,544	0,471
Region[20]								
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
Growth (GDP)	0,044	0,019	0,046	0,029	0,043	0,015	0,042	0,014
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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[20] *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						
GENDER	t (i)	29.284	14.187	946	13.723	6.991	1038
	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
$Ln(t_u)$	-0,180	-0,59	0,064	0,71	-0,334	-1,03	0,070	0,76
$Ln(t_u)^2$	0,772	4,28			0,884	4,44		
$Ln(t_u)^3$	-0,200	-6,44			-0,217	-6,46		
$Ln(t_e)$			-0,724	-8,77			-0,708	-8,36
Male	0,272	4,36	-0,210	-1,40	0,299	4,30	-0,212	-1,38
Age[21]								
15-20								
20-25	0,006	0,05			-0,022	-0,14		
25-35	-0,035	-0,26	0,140	0,92	-0,052	-0,35	0,138	0,89
Educational Level								
Short								
Long	-0,022	-0,34	-0,504	-3,45	-0,004	-0,06	-0,512	-3,43
Expenditure[22]								
Expenditure	-0,848	-2,93	0,899	1,78	-0,865	-2,78	0,941	1,81
Region								
North-West	-0,463	-4,05	-0,201	-0,72	-0,506	-3,96	-0,196	-0,69
North_East	0,212	1,91	-0,596	-2,19	0,237	1,96	-0,614	-2,21
Middle								
South-West	-0,332	-3,13	0,652	2,78	-0,382	-3,20	0,669	2,79
South-East	0,463	3,95	-0,111	-0,42	0,517	3,95	-0,114	-0,42
Permanent Contract			-2,441	-6,69			-2,468	-6,72
Type of Job Match								
Over-educated			0,164	1,04			0,158	0,97
Adeq. Educated								
Under-educated			0,222	0,40			0,208	0,36
Business Cycle								
Employment Rate	-3,225	-4,36	3,376	2,63	-3,832	-4,54	3,448	2,64
Growth	3,019	1,59	-4,978	-1,15	3,214	1,66	-4,933	-1,12
Growth (GDP)	-0,038	-1,36	-0,039	-0,57		-1,30	-0,040	-0,56
Quarter								
Q1	-0,594	-6,43	0,111	0,54	-0,635	-6,56	0,115	0,55
Q2	-0,299	-3,50	0,236	1,18	-0,328	-3,73	0,240	1,19
Q3	-0,029	-0,35	0,287	1,50	-0,045	-0,54	0,293	1,52
Q4								
Competences[23]	-2,386	-3,65	0,269	0,21	-2,436	-3,48	0,310	0,24
*Expenditure*Competences*	1,143	3,82	-0,381	-0,68	1,170	3,64	-0,405	-0,70
Constant	-1,063	-1,57	-5,136	-3,96	-0,840	-1,14	-5,315	-3,97
Pr					0,899	7,40	0,899	7,40
η					0,137	0,81	0,137	0,81
N	27244		9461				36705	
Log likelihood	-4521		-903				-5423	

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[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

	Separate Estimations				Simultaneous Estimation with unobserved heterogeneity			
	Unemployment		Employment		Unemployment		Employment	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t
$Ln(t_u)$	-0,910	-4,93	0,138	2,67	-1,192	-6,27	0,147	2,76
$Ln(t_u)^2$	1,189	10,61			1,386	11,81		
$Ln(t_u)^3$	-0,266	-13,66			-0,294	-14,60		
$Ln(t_e)$			-0,659	-13,10			-0,638	-12,46
Male	0,489	12,21	-0,331	-3,53	0,563	12,60	-0,337	-3,48
Age								
14-20	-	-	-	-	-	-	-	-
20-25	-0,087	-1,83	0,120	1,22	-0,064	-1,25	0,131	1,29
25-30	-0,125	-1,60	0,112	0,69	-0,098	-1,15	0,114	0,69
30-35	-0,256	-1,79			-0,223	-1,39		
Educational level								
Primary Ed.	-0,362	-4,34	0,545	2,44	-0,396	-4,31	0,550	2,38
Secondary Ed. (1st Stage)	-0,249	-4,75	0,148	1,26	-0,240	-4,10	0,145	1,20
Secondary Ed. (2nd Stage)	-	-	-	-	-	-	-	-
Form. Profesional (1st Stage)	-0,097	-1,08	0,114	0,68	-0,119	-1,23	0,109	0,63
Form. Profesional (2nd Stage)	0,083	1,45	-0,104	-0,81	0,072	1,14	-0,111	-0,85
Expenditure[24]								
Expenditure	2,302	3,90	-0,299	-0,22	2,996	4,54	-0,307	-0,22
Expenditure^2	-0,821	-4,63	0,064	0,15	-1,075	-5,43	0,066	0,15
Region								
North-West	-0,484	-6,22	0,029	0,16	-0,587	-6,76	0,020	0,11
North_East	0,375	4,79	-0,103	-0,62	0,455	5,34	-0,109	-0,65
Middle	-	-	-	-	-	-	-	-
South-West	-0,268	-3,25	0,377	2,25	-0,382	-4,20	0,382	2,22
South-East	0,386	4,76	0,073	0,43	0,386	4,34	0,066	0,37
Permanent Contract			-1,665	-9,48			-1,692	-9,57
Type of Job Match								
Over-educated			0,597	1,64			0,608	1,62
Adeq. Educated			-	-			-	-
Under-educated			-0,141	-0,90			-0,143	-0,89
Business Cycle								
Employment Rate	-3,659	-7,61	3,090	4,39	-5,135	-9,36	3,183	4,41
Growth	2,218	1,84	-2,948	-1,13	2,575	2,09	-2,933	-1,10
Growth (GDP)	-0,054	-3,22	-0,017	-0,40	-0,043	-2,43	-0,017	-0,40
Quarter								
Q1	-0,285	-4,63	-0,004	-0,03	-0,364	-5,76	-0,003	-0,02
Q2	0,008	0,14	0,114	0,94	-0,048	-0,82	0,112	0,92
Q3	0,209	3,73	0,359	3,17	0,188	3,31	0,359	3,14
Q4	-	-	-	-	-	-	-	-
Competences[25]	-1,529	-4,61	0,082	0,11	-1,904	-5,24	0,063	0,08
*Expenditure*Competences*	1,003	4,66	0,055	0,11	1,272	5,38	0,069	0,13
Constant	-4,376	-7,82	-2,989	-2,47	-4,497	-7,25	-3,159	-2,54
Pr					0,943	61,79	0,935	44,42
η					0,180	2,67	0,198	2,37
N	69484		18644		88128			
Log likelihood	-10627		-2400		-13004			

Table 9: Unemployment and employment hazard rates. Non-University education

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
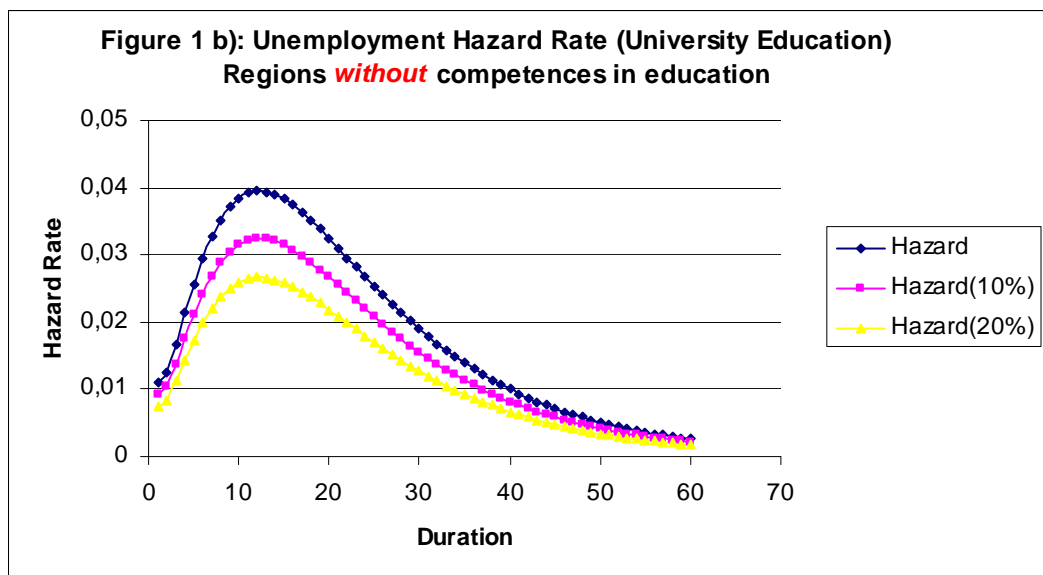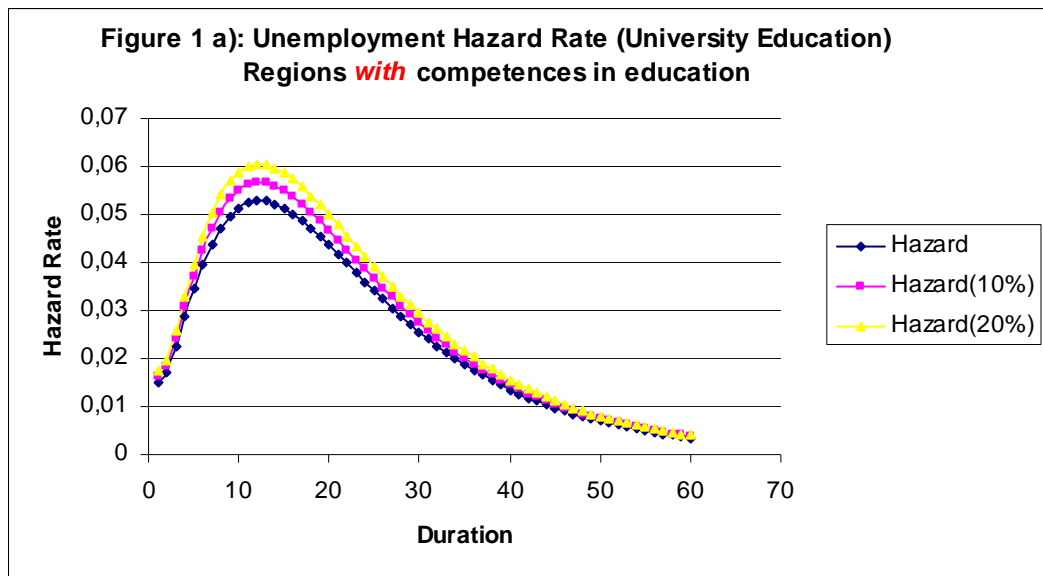
Table 10: Changes in Unemployment Hazard Rates (University Education)

ALL REGIONS

Unempl. Dur.	Hazard	Expenditure Increase 10%		Expenditure Increase 20%	
		Hazard	Variation (%)	Hazard	Variation (%)
1	0,0135	0,0132	-2,22%	0,0128	-5,19%
6	0,0356	0,0346	-2,81%	0,0337	-5,34%
12	0,0476	0,0463	-2,73%	0,0451	-5,25%
18	0,0423	0,0412	-2,60%	0,0401	-5,20%
24	0,0323	0,0314	-2,79%	0,0306	-5,26%

REGIONS WITH COMPETENCES

Unempl. Dur.	Hazard	Expenditure Increase 10%		Expenditure Increase 20%	
		Hazard	Variation (%)	Hazard	Variation (%)
1	0,0151	0,0162	7,28%	0,0174	15,23%
6	0,0396	0,0424	7,07%	0,0454	14,65%
12	0,0529	0,0566	6,99%	0,0605	14,37%
18	0,0471	0,0504	7,01%	0,0539	14,44%
24	0,0360	0,0386	7,22%	0,0413	14,72%

REGIONS WITHOUT COMPETENCES

Unempl. Dur.	Hazard	Expenditure Increase 10%		Expenditure Increase 20%	
		Hazard	Variation (%)	Hazard	Variation (%)
1	0,0112	0,0091	-18,75%	0,0075	-33,04%
6	0,0294	0,0242	-17,69%	0,0198	-32,65%
12	0,0395	0,0325	-17,72%	0,0267	-32,41%
18	0,0351	0,0288	-17,95%	0,0237	-32,48%
24	0,0267	0,0219	-17,98%	0,0180	-32,58%

Table 11: Changes in Unemployment Hazard Rates (Non-University Education)

ALL REGIONS

Unempl. Dur.	Hazard	Expenditure Increase 10%		Expenditure Increase 20%	
		Hazard	Variation (%)	Hazard	Variation (%)
1	0,0173	0,0164	-5,20%	0,0148	-14,45%
6	0,0318	0,0301	-5,35%	0,0273	-14,15%
12	0,0494	0,0469	-5,06%	0,0425	-13,97%
18	0,0470	0,0446	-5,11%	0,0404	-14,04%
24	0,0366	0,0347	-5,19%	0,0314	-14,21%

REGIONS WITH COMPETENCES

Unempl. Dur.	Hazard	Expenditure Increase 10%		Expenditure Increase 20%	
		Hazard	Variation (%)	Hazard	Variation (%)
1	0,0172	0,0196	13,95%	0,0214	24,42%
6	0,0316	0,0359	13,61%	0,0390	23,42%
12	0,0490	0,0557	13,67%	0,0604	23,27%
18	0,0467	0,0530	13,49%	0,0575	23,13%
24	0,0363	0,0413	13,77%	0,0449	23,69%

REGIONS WITHOUT COMPETENCES

Unempl. Dur.	Hazard	Expenditure Increase 10%		Expenditure Increase 20%	
		Hazard	Variation (%)	Hazard	Variation (%)
1	0,0173	0,0164	-5,20%	0,0148	-14,45%
6	0,0318	0,0301	-5,35%	0,0273	-14,15%
12	0,0494	0,0469	-5,06%	0,0425	-13,97%
18	0,0470	0,0446	-5,11%	0,0404	-14,04%
24	0,0366	0,0347	-5,19%	0,0314	-14,21%

Figures[26]

Figure 1 a): Unemployment Hazard Rate (University Education)
Regions _with_ competences in education

Figure 1 b): Unemployment Hazard Rate (University Education)
Regions _without_ competences in education

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[26] 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 2 a) : Unemployment Hazard Rate (No-University Education)
Regions *with* competences in education

Figure 2 b) : Unemployment Hazard Rate (No-University Education)
Regions *without* competences in education

Figure 3 a) : Employment Hazard Rate (University Education)
Regions *with* competences in education

Figure 3 b) : Employment Hazard Rate (University Education)
Regions *without* competences in 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