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DROPOUT TRENDS AND EDUCATIONAL REFORMS: THE ROLE OF THE LOGSE IN SPAIN [ɴ]

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Abstract

Over the last 50 years, some important reforms in European countries were aimed at improving the system of vocational studies. By contrast, the Spanish educational law (LOGSE) from 1990 moved in the opposite direction. While the LOGSE increased the number of compulsory schooling years from 8 to 10, it also eliminated vocational studies of first grade (FP-I, ages 14 to 16), thereby reducing flexibility. Dropout rates in Spain decreased from 70% in 1977 to 30% in 1995, but remained at roughly 30% until recent years, twice the EU27 average. This paper analyses the role of LOGSE, and other factors, in explaining why school dropout stopped its declining trend in the last two decades. Results show that the introduction of the new system was negative for male dropout and the abolishment of FP-I for female dropout. The reform also decreased the track choice opportunities for students and, hence, it reduced the probability of following the vocational track after completion of the compulsory stage. It is quite likely that the lack of FP-I affected more males, which in turn could help explain why we find that the reform was negative for male students while somehow positive for females.

JEL-Class: I20, J24

KEYWORDS: school dropout, educational law, vocational studies

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1. Introduction

School dropout is one of the main problems of education systems and it is therefore high on the policy agenda in most OECD countries.[1] Concerns about school dropout are based on its potential adverse consequences with respect to perspectives on the labour market, the health condition and the participation in society (Heckman & Lafontaine, 2009). Indeed, social costs associated with school dropout can be large in terms of social exclusion and, for instance, involvement in criminal activity.

While dropout rates in Europe have been falling continuously in recent decades (Felgueroso and Jiménez-Martín (2009)), they have remained stable in Spain between 1995 and 2008, and only recently started to fall due to the severe recession of the Spanish economy. As a result, dropout rates are significantly high in Spain, 26.5% in 2011, among the highest in Europe, and roughly twice the EU27 average, which stands at 13.5%.[2]

As in previous recessions, young people (15-24 year-olds) have been particularly affected, especially the least educated (OECD (2012)). In Spain, the youth unemployment rate reached 53% in 2012, an increase of 34 percentage points since 2007. Young people's low skills due to persistently high dropout rates are partly responsible for their bad performance in the labour market. In this context, it is crucial to understand why dropout rates are so high in Spain in order to formulate adequate labour market and educational policies for young cohorts.

A closer look to long-term dropout rates in Spain (see Figure 1) reveals a clear break in its negative trend in the mid 90s. In this sense, it is very interesting to analyse what may have happened in the mid 90s that contributed to deterring the declining process of dropout rates in Spain. The hypothesis investigated in this paper is that the implementation of a new educational law in academic year 1991-92 (*Ley Orgánica de Ordenación General del Sistema Educativo*, LOGSE, passed in 1990) was one of the key factors that prevented dropout rates from falling further in the 90's. This law replaced the previous one (*Ley General de Educación*, LGE, 1970). Undoubtedly, the Spanish production model, very specialized in low-skill low-educational sectors, also contributed to sustain a very high dropout rate. However, this second factor was more influential in the early 2000's as documented in Felgueroso and Jiménez-Martín (2009).

'Insert Figure 1 here'

The LOGSE in 1990 increased the number of compulsory schooling years from 8 to 10 and, hence, it provided two more years of academic curricula. This way the starting age of non-compulsory secondary education (*Bachillerato*) increased from 14 to 16 years old and the ending age of primary education moved from 14 to 12. It also delayed the choice between

[1] The definition of dropout rates is quite broad. In this paper, a dropout is an individual aged 18-24 with at most lower secondary degree and not in further education or training. According to the International Standard Classification of Education (ISCED), this corresponds to having completed as maximum level secondary education of first stage (ISCED 2), at the age 16 years old. Clearly, any individual who did not even complete ISCED 2 is also considered a dropout.

[2] In 2010-2012 the incidence of early-school leavers decreased by five percentage points. This was most likely driven by the recession since youngsters were less attracted by the pool of low-skills jobs that had been easily available before the start of the crisis.

academic or vocational paths for two years, until the age of 16. As a result, vocational studies of first grade (FP-I, ages 14 to 16) were eliminated and all students from that range of age were forced to study secondary compulsory education.

In this paper we argue that the 1990 reform, especially the abolishment of first grade vocational studies, was a mistake. With the reform a more flexible system was replaced by a more rigid new system. In this context, students less keen on continuing their studies towards a more academic type of degree were obliged to proceed and were not given the chance to move towards a more vocational type of training.

To identify the likely effect of the new educational law on dropout rates and also on vocational track enrolment we use regional variation in the timing of implementation of the LOGSE.[3] This allows us to build up a natural experiment that uses the variation in implementing the law across regions to test whether the shift from LGE to LOGSE, amongst other factors, contributed to suspend the declining trajectory of dropout rates observed years earlier.

The rest of the paper goes as follows. In section 2, we describe the trends and factors underlying school dropout in Europe. Section 3 explains the main educational reforms in Europe over the last 50 years, including the Spanish one from the early 90s (LOGSE), and shows the differences across regions in its implementation. In section 4, we present the data, the methodology as well as the identification strategy; we discuss the validity of our natural experiment and present some descriptive statistics. The main results obtained from the analysis are described in section 5. Finally, section 6 concludes.

2. Trends and drivers of school dropout in Europe

Dropout rates are very different across countries. More importantly, Figure 2 shows that most countries reduced their dropout rates over the period 1997-2007, except for Spain and the Scandinavian countries. In fact, Spanish dropout rates decreased from 70% in 1977 to 30% at the end of the 1990s, but remained at roughly 30% until 2008. School dropout rates recently declined to 26% since the recession brought back to study some youngsters. By contrast, Italy and Portugal, the two other EU15 countries with very high incidence of school abandonment, improved their rates between 1997 and 2007. This is especially the case for Italy, whose dropout rate declined ten points. Ireland also experienced a substantial decline in school abandonment over this period, around 7 points, and the rates in UK, Greece and the Netherlands progressed as well around five points. Despite having experienced a slight increase in the prevalence of dropout, the Scandinavian countries continue to hold the lowest dropout rates in Europe.

'Insert Figure 2 here'

One of the results of a large number of early school leavers in a region can be the generation of a dual composition of the population by educational levels, which consists of a high share of individuals with high and low educational attainment and by a low share of medium attainment. As shown in Figure 3, Spain is clearly characterised by this dual composition. Although the fraction of low educated people decreased between 1996 and 2008 (about 17 percentage points), Spain remained well behind other countries (Portugal, Italy and Greece).

[3] Table A1 in the appendix shows the sketch about how the reform was implemented.

'Insert Figure 3 here'

Moreover, Figure 3 shows that the proportion of population in Spain with medium degree continues to be amongst the lowest in Europe, despite having increased around 7 percentage points over this period. By contrast, the share of highly educated individuals evolved very favourably (around 10 percentage points) and it is currently among the highest, certainly above the EU 15 average. Hence, this data reveals that Spain was quite successful in achieving a large share of population with tertiary qualifications, but did not manage to shift the fraction from low to medium (Felgueroso and Jiménez-Martín (2009)). Other northern European countries are better located in this respect. For example, while the Netherlands's share of highly educated population is not far from the Spanish one, its proportion of low educated is much lower.

The composition of the population by educational levels determines a country's productivity and livings standards. In fact, studies point out that it is more efficient to devote resources to reach a very large proportion of individuals with secondary education rather than the aforementioned dual composition with a very large number of dropouts and relatively high tertiary rates (World Bank (2005)). Clearly, the reduction of the incidence of school dropout is key to achieve a larger share of individuals with secondary education.

There are many factors that affect the level of early school-leavers such as the nature of the education and training system, the productive model, the role of the parental involvement, family background, flextime at work and economic cycle conditions (Blondal and Adalbjarnardottir (2009); Pereita and Pastor (2000)). With respect to the educational pathways, it is difficult to develop a criterion that summarises all the relevant aspects. One possibility is to look at the share of upper education that is vocational (and not general), and the prevalence of combined work and academic within upper vocational studies. Indeed, according to Gangl (2003), one of the key aspects in order to boost medium educational levels is a well-functioning vocational training system. Within this framework, the report by Field et al. (2007) emphasises the importance of having a high fraction of upper secondary education in vocational studies rather than in general courses. It is also positive regarding the use of more work-based vocational programs.

Overall, these suggestions are directed to countries whose vocational system is relatively poor. For example, a survey on educational patterns for Spain explicitly mentions that the attractiveness of vocational studies in this country could be raised (OECD (2008)). The report proposes that vocational teaching should be evaluated with respect to their success in the transition of graduates to qualified jobs and that this information should be made available. It also advises to improve general skills within the vocational pathways such as written expression and foreign languages since employers generally complain of graduates' weakness in these competencies. Finally, this analysis recommends enhancing the possibility to transfer from upper vocational studies to tertiary education. This would make these programs more appealing to students, but without detriment of the university quality standards.

Most studies also point out that vocational programs may have the added benefit of dropout prevention. For example, Meer (2007) argues that students with practical abilities are better off with a vocational degree than academically oriented individuals and vice versa. Other authors also find that a well-functioning vocational system is helpful to prevent early school

abandonment (Haywood and Tallmadge (1995), Digest (1987), Plank et al. (2005)). Furthermore, there is evidence that countries with an extensive vocational training system will have more positive volatility in the labour market (transitions between education, employment and apprenticeship) than countries without these systems (Brzinsky-Fay (2007)). Although other aspects of the learning model and career paths are very important, the structure of upper education is clearly a key factor.

'Insert Figure 4 here'

In this context, Figure 4 shows that there are large differences across countries in the distribution of enrolment by program orientation in the upper secondary education. It distinguishes between general education, combined school and work-based vocational/technical programmes and only school-based vocational/technical programs. This data allows classifying countries in terms of their enrolment patterns in upper education in 2007 (see Table 1). On one hand, we distinguish three groups regarding the weight of vocational studies on the upper secondary level: high if the share of vocational education is above the third higher percentile; medium if the rate is in the middle third percentile and low if it is below that.

'Insert Table 1 here'

On the other hand, we also differentiate three groups in terms of the share of combined school and work-based in the overall enrolment of students in vocational programs (the alternative being school-based only): high if the share is located in the last third percentile; medium if the share is in the middle third percentile and low (or nil) if it is below. Following both dimensions of classification, Austria and Czech Republic are characterised by a high proportion of vocational studies in upper education and they also have a high rate of vocational programs that combine school and work. Other countries with a relatively high prevalence of vocational studies are Belgium, the Netherlands and Finland. On the lower spectrum are located Greece, United Kingdom and Portugal.[4]

Hence, there is a broad consensus that the structure of secondary school and, in particular, of the vocational studies, is crucial for lowering the incidence of dropout. The educational system in each country is the result of educational reforms that took place over the last century (see next section). In this sense, it is very interesting to analyse the implementation of the Spanish educational reform in 1990. The new law somehow moved against this principle by abolishing the possibility of undertaking vocational studies at earlier stages.

2.1. Literature

This section describes the main research about school dropout distinguishing four main lines. First, some papers investigate the gains from additional schooling using changes in compulsory school laws as instruments, which allows estimating the counterfactual for students that would otherwise have left sooner (Angrist and Krueger (1991) and Acemoglu and Angrist (2000) for the US; Harmon and Walker (1995) for the UK; Oreopoulos (2007) for the US, UK, and Canada; Brunello and Rocco (2010) for the European Countries). Overall, they find that compulsion school raises earnings to individuals that otherwise would be dropouts. Other

[4]See Hasluck (2004), Hannan et al. (1996) and Raffe (2008) for further discussion on educational systems.

studies examine non-pecuniary outcomes of school dropout such as committing crime or ending up in jail (Lochner and Moretti (2004)) and the effects on mortality (Lleras-Muney (2002)).

Second, there are structural models that analyse the choice of post-secondary studies such as the decision of attending high school, staying at home or employed in various occupations (Keane and Wolpin (1997)). Within the same context of selecting the educational path, Eckstein and Wolpin (1998) study high school progression in the US where individuals can work and attend school. Their results indicate that a policy that forced youths to remain in high school for five years or until they graduate, whichever comes first, without working would increase the number of high school graduates by slightly more than 2 percentage points. Arcidiacono (2004, 2005) develops a sequential model for college attendance that accounts for both the demand as well as the supply side of schooling. Results show that differences in monetary returns explain little of the sorting and instead the preferences are the most important determinant of the choice. For the Spanish case, López-Mayan (2009) analyses the choice between academic and vocational tracks, and she finds that there is a strong association between decreasing the dropout rate in upper secondary education and the increase of annual wage of medium vocational education qualifications.

Third, there are some papers that investigate the determinants of dropout focusing on family background, type of schools, intergenerational mobility, transmission and persistence across generations (Dustmann (2004) and Blanden (2009)); the state of local labour markets (Duncan (1965) and Clark (2007)); and cohort size (Felgueroso and Jiménez-Martín (2009)). Mora, Escardíbul and Espasa (2010) look at the impact of expenditure per pupil, class size, and pupil-teacher ratio on dropout rates at the end of compulsory education in Spain. They find the expected signs, although the magnitude of the effects is relatively small. Lacuesta et al. (2012) study the reaction of school attainment to changes in relative wages and find that the increase in the unskilled to mid-skill wages ratio observed between the years 1993 and 2001 led to a 1.8 percentage points increase in the fraction of youth who completed primary education (or less), mainly at the expense of the proportion of youth completing upper high school.

Finally, some authors evaluate education policies aimed at reducing dropout, mainly those related to financial incentives. For example, Dynarski (2003) analyses the impact of incentives for college attendance and completion in the US and Schultz (2003), Todd and Wolpin (2003) study the PROGRESA program in Mexico. Angrist and Lavy (2004) look at the sensitivity to monetary incentives for obtaining a high school graduation certificate in Israel, and find some positive results. Dearden et al (2009) find that a means-tested conditional cash transfer paid to 16- to 18-year-olds for staying in full-time education is an effective way of reducing the proportion of school dropouts in the UK. Van der Steeg (2006) evaluates the effectiveness of a scheme in the Netherlands that provides a reward of 2000 euro per school dropout less in 2006-07 by comparing the change in school dropout in regions were this was implemented with regions where it was not. Overall, the message of all these papers is mixed, some finding clear gains in providing financial incentives to proceed studying, and others do not.

Our paper suits within this last group of research that tries to find out education policies that may help reducing the incidence of school dropout. In particular, it focuses on the association between the introduction of the LOGSE law and the Spanish evolution of school abandonment.

3. Educational reforms in Europe

Over the last 50 years there have been many educational reforms across countries affecting multidisciplinary aspects. Amongst them, those reforms that were probably more important for the incidence of dropout were those affecting the number of years of compulsory school and those regarding the main organisational and curricular aspects of secondary and post-secondary non-tertiary studies (ISCED 2-4).

Simultaneously, there were changes in other educational levels (pre-primary, primary and tertiary education) and dimensions (for instance, with respect to teachers, school autonomy and special education). Although those were also relevant for the well-functioning of the educational system, in general, their impact on early school-abandonment was probably smaller. For simplification, these reforms are not incorporated in the educational calendar in Figures 5 and 6 but a description of them can be read in Garrouste (2011).

'Insert Figure 5 here'

Figure 5 shows the reforms in the number of years of compulsory education that took place over the last fifty years in several countries in Europe. The range of compulsory years is between 9 and 12. The majority moved compulsory education upwards over this period of time. In particular, it is remarkable the gradual shift from 5-6 to 10 in Greece, Italy and Spain. Most other countries had done this shift earlier on. However, increasing the number of years in compulsory education, in spite of being a positive move in terms of guaranteeing somehow better minimum standards, it does not affect the ultimate level of dropout. More important is how secondary school is organised.

'Insert Figure 6 here'

Figure 6 shows the reforms in the main organisational and curricular laws of secondary and post-secondary non-tertiary (ISCED 2-4). We observe that most countries implemented changes to the vocational systems to adapt them to new needs and to make their degrees more compatible to academic degrees. By contrast, in Spain there was a reform in 1990 (although effective since 1991-1992) that abolished vocational studies of first grade and, consequently, somehow moved in the opposite direction.

In Figure 7, we place together the most important reforms over time and the evolution of dropout rates for several countries in order to have a first look on whether there is a potential relationship between them. For the Spanish case, it is quite straightforward to observe that the timing of this law matches the break in the mid 90s of the declining trajectory of the dropout rates. In Italy and Portugal, we observe a certain accentuation of their declining profile of dropout rates when they implemented reforms to boost vocational studies. For other countries, the relationship is less clear but none seems to contradict this hypothesis. Therefore, overall Figure 7 shows some signs that indeed the way in which the educational system evolves may be important for the incidence of dropout.

'Insert Figure 7 here'

3.1 Educational reform in Spain: the LOGSE

Hence, the hypothesis investigated in this paper is that the implementation of a new educational law in 1991-92, the LOGSE, that replaced the LGE, was an important aspect that prevented dropout rates from falling further. Figure 8 summarises the educational path of the two systems.

'Insert Figure 8 here'

Under the LGE, compulsory education was between 6 and 14 years old and covered the EGB (*Educación General Básica*) or primary education. Individuals who did not manage to graduate from EGB were obliged to move towards lower vocational studies (*Formación profesional*) until the age of 16 (FP-I). This meant that compulsory education was until the age of 14 for individuals who completed EGB but until 16 for those who did not and went to first grade vocational education. A student who completed EGB could either choose secondary education – BUP (*Bachillerato Unificado Polivalente*) or vocational studies of second grade – FP-II. A secondary education degree could be followed by academic high school – COU (*Curso de Orientación Universitaria*), a specialised track to attend university.

On the other hand, the LOGSE made compulsory primary education EPO (*Educación Primaria Obligatoria*) until 12 years old and compulsory secondary education ESO (*Educación Secundaria Obligatoria*) until 16 years old. After that, the student could either choose Academic High School (*Bachillerato*) for two years (until 18 years old), and get prepared to attend university, or move to vocational studies (*Formación Profesional de Grado Medio*).

Hence, the LOGSE set up several organizational changes, two of them key for the analysis of this paper. First, it increased compulsory schooling age for all students by two years, from 14 to 16. Second, it shortened primary education from 14 to 12 and introduced a new four years stage of secondary compulsory education (ESO) from 12 to 16. Therefore, the starting age of Academic High School (*Bachillerato*) increased from 14 to 16 years old. As a result, vocational studies of first grade (FP-I, ages 14 to 16) were eliminated and all students from that range of age were forced to study secondary compulsory education. The latter implied that less academic oriented students were obliged to proceed and were not given the chance to move towards a more vocational type of training. This could have possibly generated *negative peer effects* since the less-academic and less-motivated students were left together with the rest, and the chances were high that they hold the general progress back. At the same time, by forcing students to remain in the academic track for longer periods could have deterred enrolment in the vocational track.

One of the key aspects of the reform that can be used for the analysis is that there were differences across regions in the implementation of the educational law. Figure 9 shows that there is a large variation in dropout rates across regions and that these rates changed in the last two decades. Besides demographic and labour market factors, how fast regions implemented the LOGSE possibly played a crucial role in explaining the different regional trends in dropout. In this sense, the analysis uses the variation across regions in when the LOGSE became in operation to test whether the shift from LGE to LOGSE, amongst other factors, contributed to suspend the declining trajectory of dropout rates observed years earlier. This is a reasonable natural experiment exercise since the differences in timing and velocity of carrying out the LOGSE were uncorrelated with the initial level of dropout rates of these regions.

On these grounds, Figure 9 shows the *12-17 years old index of exposure of the LOGSE* (*fraction of the 12-17 population under the LOGSE* and the *16-17 years old in vocational index of exposure of the LOGSE*) over the period 1990-2003, and we observe that some regions started to implement it in academic year 1990-91, but others did it later. By the academic year 2002-03, the LOGSE was in place in all regions.

'Insert Figure 9 here'

4. Econometric model

We would like to test the effect of the educational law LOGSE on the individuals' probability of being a school dropout. The probability of dropout is associated with the degree of exposure of each individual to the LOGSE (the treatment indicator), amongst other factors.

In more detail the basic model we consider is as follows:

$$y_{iqr}^{*} = \alpha + X_{iqr}'\beta + \gamma T_{iqr} + \delta Z_{qr} + u_{iqr}$$

Where y_{iqr}^{*} denotes the propensity to dropout of individual *i* from birth cohort *q* in region *r*, *X* is a vector of individual and family characteristics, *T* denotes treatment (1 if exposed to the LOGSE, and zero if exposed to the LGE) and *Z* is a vector or regional controls at the time of entry in the labour market.

Since y_{iqr}^{*} is unobservable, we define $y_{iqr} = \mathbf{1}\,(y_{iqr}^{*} > 0)$. Hence, our dependent variable takes value one if the individual is a dropout, that is, he/she is between 18 and 24 years old (21 in some experiments in order to minimize the potential sample selection problem due to nest leaving) with at most lower secondary degree and not in further education or training; otherwise, it takes value zero. Assuming normality of the error term *u* we can (up to scale) identify the parameters of the model by estimating a probit model by maximum likelihood. Given that our policy variables have variation at the regional level, we cluster standard errors at that level of variation.

It is worth noticing that in our "natural" experiment there are two groups of subjects: a *control group* who did not have exposure to the LOGSE and a *treatment group* who did have exposure to this law. Since we do not have complete information on whether an individual studied under the LGE or LOGSE, the indicator for the control and treatment group is determined by an instrument that allocates the level of exposure to the LOGSE to each individual. Had we known for each individual the system under he/she studied we would have used that variable as our treatment for evaluating the impact of the law.

Hence, we can only use an instrument for the treatment that is calculated using external information for the individual related to the region and time. This allows classifying each student according to the level of exposure for the law using three dimensions: year, region and date of birth. For instance, we know that in a particular region and year, the proportion of students within a certain age band under the LOGSE system was κ. We then allocate this κ to that individual according to his/her date of birth, which becomes his/her *index of exposure of the LOGSE* as in Duflo (2000).

As said, since the introduction of the LOGSE progressed differently across schools and regions we do not know exactly whether an individual was exposed to the treatment or not. However, we can clearly consider three periods: before 1991 only the LGE was in place and hence

treatment=0 for all the individuals; between 1991 and 1999 both the LGE and LOGSE coexist with differences across regions and hence some individuals will be allocated to 0 and others to 1 depending on their region; from 2000 onwards only LOGSE is in place so *treatment*=1 for all the individuals.

As with any independent variable, we would like to check whether the measured effect of the *index of exposure of the LOGSE* is casual. That is, is the difference in the likelihood to be a dropout between individuals who were exposed to the LOGSE and those who were not due to this exposure, or is this indicator simply reflecting something else? It might be that the individuals exposed to the LOGSE would have had, on average, higher dropout even if they had not been exposed to the LOGSE. The more ad-hoc was the allocation of the incidence of the LOGSE across individuals, the more likely that our estimates for the *index of exposure of the LOGSE* will show the appropriate relationship between this indicator and the probability of dropout.

In this sense, it is very important to control for as many factors as possible that might be related to whether an individual was exposed to the LOGSE (see Table 2 for the descriptive statistics of these variables for the entire sample as well as disentangling for men and women). In our regression, besides the individual index *of exposure of the LOGSE* we include other variables (more information can be read in Appendix): demographic characteristics such as whether the individual as a child cohabited with a father or mother, parental education, cohort effects and origin; labour market and economic factors that vary across regions and time (expected wage at age 30 by education level, unemployment rates, the share of employment in construction and the rate of regional growth).

'Insert Table 2 here'

The analysis also includes educational characteristics such as the volume of repetitions (one minus the adequacy rate at age 15). The more doublings there are the larger will be the incidence of *negative peer effects*. In fact, data shows an increasing trend of doublings in recent years, probably due to the fact that students cannot be expelled from the system until they are 16 years old. Another variable is whether a region had full competences in education or not. Regions who have full competence since the beginning of the period of analysis are Catalonia, Bask Country, Galicia, Andalusia, Canary Islands, Community of Valencia and Navarre. The rest are under the ruling of the Ministry of Education (MEC), but many of them started having competences during the transition period (1991-1999). In addition to the previous variables, the study also incorporates region dummies to control for other possible factors that are region specific and may be related to dropout but are not included in the regression. Similarly, we include year of birth dummies to take into account for systematic differences that may vary over time and could have an impact to dropout but are not in the model.

4.1. Description of the data and the use of a natural experiment

This paper uses data from the Spanish Labour Force Survey (Encuesta de Población Activa, EPA) from 1987 to 2010. We restrict our sample to individuals from 18 to 24 years old born in the cohorts potentially affected by the reform, between 1977 and 1986. Since the first year of implementation of the LOGSE was in academic year 1991-92, this means that individuals born

in 1976 were not affected by the change in law. Similarly, the last academic year of the pre-LOGSE system was 2001-02, which implies that all individuals born from 1987 onwards were fully in the LOGSE system. As a result, cohorts between 1977 and 1986 were affected by the reform depending on the region and constitute the basis of our sample. This methodology has been appointed by others (see Lacasa (2006)) but it has not been formally analysed. One crucial condition for our analysis is that the differences in the implementation of the LOGSE across regions were independent from dropout rates at the initial state. That is, for our econometric model to work it is essential that there is no rationale behind the differences in the implementation of the new educational law across regions. For this purpose, we calculated the correlation between dropout rates across regions in the first period of the analysis and the degree of implementation of the LOGSE the same year and found that the two events were uncorrelated. This finding reinforces the approach followed in the paper.

4.2 The proxies for the treatment

Clearly, the construction of an indicator to account for the degree of exposition of a region (or individual) to the LOGSE is very important since this is the variable that we would like to test in this paper. We include different measures for the *index of exposure of the LOGSE* (see the Appendix) because the law affected to various levels of the education system. In this sense, we create a global indicator of the exposure of the LOGSE *(% students in LOGSE 12-17*). But we also construct others more specific that look, for instance, at the exposure of the new law in terms of the abolition of vocational studies of first grade *(% students in FP-I*), and the rate of students in the first two years of the new compulsory secondary education *(% students in ESO-I*).[5]

In this context, it is important to point out that the increase in the compulsory age from 14 to 16 years old favours our identification strategy since all the students during the period 1991-2000 period were obliged to study until 16 year old, either under the old track (LGE) or the new one (LOGSE). This means that we can observe all individuals from 14 years old to 16 for both educational systems.

5. Results

Table 3 shows the results from the estimation using individual data for men and women aged 18-24 at the time of the interview.[6] For each gender, we present three specifications which differ in the indicators used to proxy the degree of exposition to the LOGSE: (1) The fraction of students under the LOGSE at ages 12-17; and (2) the fraction of students under LOGSE at ages 13-14 (ESO-I). In both specifications we include the fraction of students enrolled under FP-I (which disappeared with the introduction of the LOGSE).

'Insert Table 3 here'

First of all, it is noteworthy the fact that the estimates that account for the exposure to the LOGSE respond differently depending on the gender. On the one hand, we observe a positive

[5] We have also considered the fraction of students in the 3rd and 4th grade of ESO (highly complementary to the fraction studying FP-I). However, the inclusion of this variable does not seem to change the key evidences obtained from the analysis.

[6] Similar results are obtained when restricting the sample to individuals aged 18-21.

and significant effect for men since those who were exposed to the LOGSE (12-17) are more likely to dropout. One very plausible explanation is that the abolishment of Lower Vocational studies or FP-I for children aged 14 to 16 years old that took place after the implementation of the LOGSE had a negative impact on the willingness to continue studying for men. This is because it is very likely that an important group of males that were less academic oriented had their more appropriate educational path closed. That is, boys that would have done much better in vocational studies were forced to follow a more academic track; they lost motivation and quit studies at 16 years old. Under the previous law (LGE) these type of students would have proceed Lower Vocational Studies until 16 years old and perhaps an important share would have continued until High Vocational Studies after the age of 16. For example in 1990-91 there were 266 thousand males enrolled in FP-I and 207 thousand females (39.1% and 31.9% of the 14-15 population, respectively).

On the other hand, results show that females under the LOGSE had a lower probability to dropout. The rationale of this finding for females is very different from that for men. For females, the negative correlation between the implementation of the LOGSE and dropout is probably due to the fact that less women tended to choose FP-I and hence were less affected by its abolition. Another plausible explanation could be that at the end of the 90s there was a change in the production model that affected men and women asymmetrically with more male human capital demanded in construction. In this sense, in the mid 90s the share of people employed in the construction sector was stable at 10%, but started to escalate in 1998, and by 2000 the ratio was at roughly 12%.

To that, the decreasing level of complexity in the curriculum required in secondary school in the LOGSE compared to the LGE (Delibes-Liniers (2006)) also might have contributed to relax the incidence of dropout after the introduction of the new law. This has made easier to complete secondary school and continue towards non-compulsory education. For males, however, it is possible that the simplification in the curriculum did not offset other characteristics of the LOGSE that reduced their incentives to study further.

With respect to other indicators of the exposition of the LOGSE, we find that the presence of lower vocational track (FP-I) has a small negative effect on the dropout rate for males and a negative effect for females. One explanation is that the existence of FP-I under the LGE helped reducing the *negative peer effects* in the secondary school since it selected into the more academic track only those students who were more motivated. Besides the specifications of the LOGSE, other factors were also important to explain the evolution of dropout. With regards to the demographic indicators, we observe that the pattern is similar across genders, although the magnitude is different. In this context, results clearly show that non-natives have a higher probability of dropout. Data also reveal the importance of the parental role since individuals whose parents were not present in the household were more likely to abandon further education, as well as individuals whose parents had been a dropout.

The regression also includes cohort effects to check whether there is a relationship between the relative number of individuals who have the same age and dropout to account for the possibility that perhaps more competition reduces returns to education and then the

willingness to study longer (and hence increases dropout). However, we find weak evidence for this hypothesis since the estimates are positive but not significant.

Another indicator that may affect the decision of abandoning school is the perception of the opportunities given by the labour market. In this sense, we observe that the higher the expected earnings at the age of 30, the lower female dropout, but this relationship is insignificant for males. With regards to the production model, we observe that the larger the weight of the construction sector, the higher (although not significant) the probability to abandon further education for men, but the opposite for women. This suggests that it is quite likely that the boom of the construction sector over the last years until the starting of the recession in 2007 helped deterring the improving rates of dropout observed earlier on. This is line with the research by Aparicio (2010) who finds that the improvement in the labour market prospects of low educated workers motivated by the increases in employment and wages in the construction sector during the recent housing boom raised men's propensity to dropout of high-school, relative to women.

Finally, regarding the educational model, we observe that men who studied in the regions with early competences in education tend to have higher incidence of dropout, but this effect is not significant for women. One factor that is likely to have played a role in this finding is the fact that regions with non educational competences are much less populated, and this may affect the way schools are organised. Furthermore, this result could simply reflect a transition period that regions with more educational competences need to take on in order to adjust to their new specific policies.

5.1 Robustness Checks and extensions

In Table 4 we present the results obtained in two sample experiments. The first one excludes immigrants (about 2 percent of the sample) since they may have not fully studied under the Spanish system or may have extra language difficulties. Although this fact did not play a crucial role in deterring the improving rates of dropout in the last decade, it will probably do over the next years since the proportion of foreigners attending compulsory secondary school will grow considerably (see Zynovieva et al, 2008).

'Insert Table 4 here'

Note that the elimination of individuals born abroad does not alter the key conclusions of the analysis. The educational coefficients, that is, % studying LOGSE and the fraction studying ESO-I, remain significant for females and males. However, the coefficient of the fraction studying FP-I, that was significant at 5 percent in the whole sample, losses significance. One possible explanation could be that the positive effect of the existence of FP-I on continuing further education was relatively larger for the immigrant population.

In the second experiment we add the variable "quarter of birth" to the specification since it has been widely used in the literature that this is an important factor. Because of this addition we have to restrict the EPA to 2001-2010. For example, Gutiérrez and Adserà (2012) find that youngest students in a class in Catalonia tend to underperform the rest academically and this maturity gap does not drop as children advance into latter grades. This suggests that decisions

on cut off rates are very important since they affect future learning outcomes. We observe that individuals (males) born in the last quarter of the year are more likely (from 2 to 3 percent depending on the specification) to dropout, ceteris paribus, which is in line with previous research.[7]

5.2 Implications on the change in the educational law on the track choice.

The introduction of the LOGSE and, in particular, the progressive removal of the lower vocational track (generally available for students aged 14-16 before the LOGSE) may have had consequences on the path (either vocational or academic) choice. In order to check whether this is the case, we estimate the probability of taking vocational studies after compulsory education.

We observe in Table 5 that the coefficient of lower vocational studies is positive and highly significant for females and positive but not significant at 5 percent for males (in fact, many of the important variables appear to be more significant for females than they are for males). The marginal effect is very large, especially for women. It implies that an increase of one percent in the fraction studying FP-I increases the probability of studying lower vocational studies by 0.41. Consequently, the LOGSE by eliminating the lower vocational track reduced by a large the fraction studying the vocational track. The effect for women can be quantified between 4 and 10 percentage points and for men between 2 and 5 percentage points, depending on the year taken as a reference.

The rest of the results are by no means less important. Particularly interesting are the coefficients of father's present and father's dropout (that go in opposite directions), cohort size and the expected real wage ratio (between educational levels 3 and 1) at age 30. In this sense, individuals whose father was present have 6 percent less probability of choosing the vocational track and those whose father was a dropout have a probability of choosing the vocational track 6 percent higher. Likewise, belonging to a larger cohort increases the probability of selecting the vocational path by about 16 percent, and the higher the expected real wage of educated worker at age 30 the lower the probability of choosing the vocational track, although the latter coefficient is only significant for women.

'Insert Table 5 here'

6. Conclusions

Dropout rates in Spain are abnormally high compared to other European countries. After two decades (the 70s and the 80s) of continuous fall they have at roughly 30% since 1995. Obviously this may have strong consequences in the future labour opportunities of Spanish workers and may compromise the future growth path of the Spanish economy.

This paper explores the role of the educational law (LOGSE) from 1990, and other factors, in explaining why school dropout stopped its declining trend in the last two decades. In this paper we have argued that, by eliminating lower vocational studies, the law moved the educational system in the opposite direction than other educational reforms in Europe.

[7] Note that the addition of these variables barely affects the coefficients of the rest of the variables.

Differences in the timing of implementation of the LOGSE across different regions are used to identify whether this law contributed in deterring the rate of improvement of the dropout rates observed in years before. Our empirical strategy makes use of the demographic information available in the EPA to control for both personal and family characteristics.

Results show a negative relationship between the LOGSE and the incidence of school dropout for men. It is of particular interest the fact that the effect is asymmetric by gender. Although a priori this result may be surprising, there are good reasons to think why this could be the case. On the one hand, we observe a positive and significant effect for men since those who were exposed to the LOGSE are more likely to dropout. One very plausible explanation is that the abolishment of FP-I (Lower Vocational studies) for children aged 14 to 16 years old that took place after the implementation of the LOGSE had a negative impact on the willingness to continue studying for men. This was because this sort of studies was more appealing for them. It is also possible that, for boys, mixing the good and the bad students in the same class (in the last two courses of the new track) had worst negative consequences than for girls. A complementary explanation of the differences across gender is the changes in the production model of the economy. That is, it is quite likely that the construction boom from the end of the 90s until the starting of the recession in 2007 contributed to deter the improving rates of dropout observed in previous years.

On these grounds, the government approved in July 2011 a new law for Vocational Studies aimed precisely at enabling the transition from secondary degree in ESO to professional programs for students who did not complete their degree. Hence, the new law facilitates the transition to specific programs for professional training. Until now, those were limited to those individuals aged 16 or older who did not complete ESO. Instead, under the new law, individuals aged 15 can have access to these programs for professional training and, if they succeed they can continue towards Vocational Studies. Similarly, the new law enables individuals moving from Medium Vocational Studies to High Vocational Studies without the need of completing secondary non-compulsory school (*Bachillerato*), and after taking a special course. For that, around 20-30% places in High Vocational Studies will be reserved. All these new measures will probably contribute in reducing the high incidence of dropout and are quite in line with our findings.

On the other hand, the paper also explored two extensions: the role of the quarter of birth in explaining dropout rates and the choice of educational track. Regarding the first question, results confirm the relevance of the quarter of birth in explaining educational outcomes. However, the effect is only significant for males born in the last quarter who experience about 2 to 3 percent higher dropout rates. Regarding the selection of the educational path, we observe that, after the introduction of the LOGSE, the elimination of the lower vocational track has significantly reduced the choice of the vocational track.

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Appendix. Construction of the variables for the microeconomic analysis

Dependent variable:

Dropout (a dummy variable that takes value 1 if the individual is a dropout and zero otherwise). An individual is considered to be a dropout if she/he is currently not studying (the variable SIDIV of the survey EPA is different from one) and her/his maximum level of education is primary education or first stage of basic education, age 16 (ISCED<=1).

Track choice: A dummy variable that takes 1 if the individual chooses the vocational track after having completed compulsory education.

The regression is estimated separately for women and men.

Covariates:

Three different measures of the degree of exposure to the LOGSE:

- *12-17 years old LOGSE index: fraction of the 12-17 population under the LOGSE (ESO-I & ESO-II & Bachillerato).*
- *12-13 years old LOGSE index: fraction of the 12-13 population under the LOGSE (ESO-I).*
- *FP-I: fraction of the 14-15 population studying FP-I.*

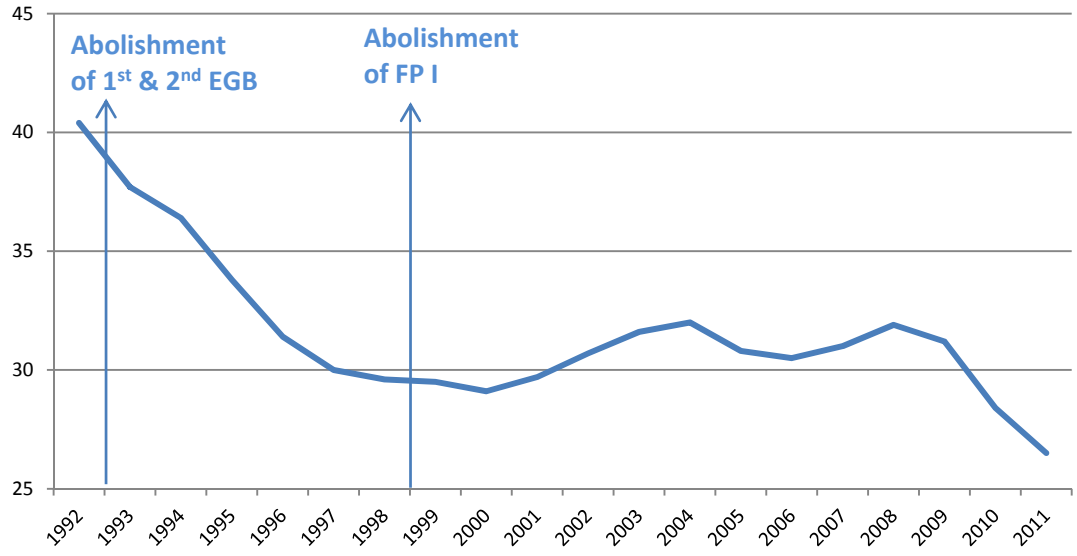
Individual factors

- Nationality: dummy one if born abroad (*non-native*).
- Parental presence: dummy one if mother presence (*mother*) and dummy one if father presence (*father*).
- Parental education: dummy one if mother was a dropout (*mother dropout*) and dummy one if father was a dropout (*father dropout*).
- Cohort effect: a measure that combines the relative number of individuals who have the same age with respect to the region size (direct competition to the individual) and the relative number individuals who are 1 or 2 years around the individual's age (with a weight of 2/3) reflecting the partial competition. This follows the normalisation of Welch (1979).

Regional and time factors

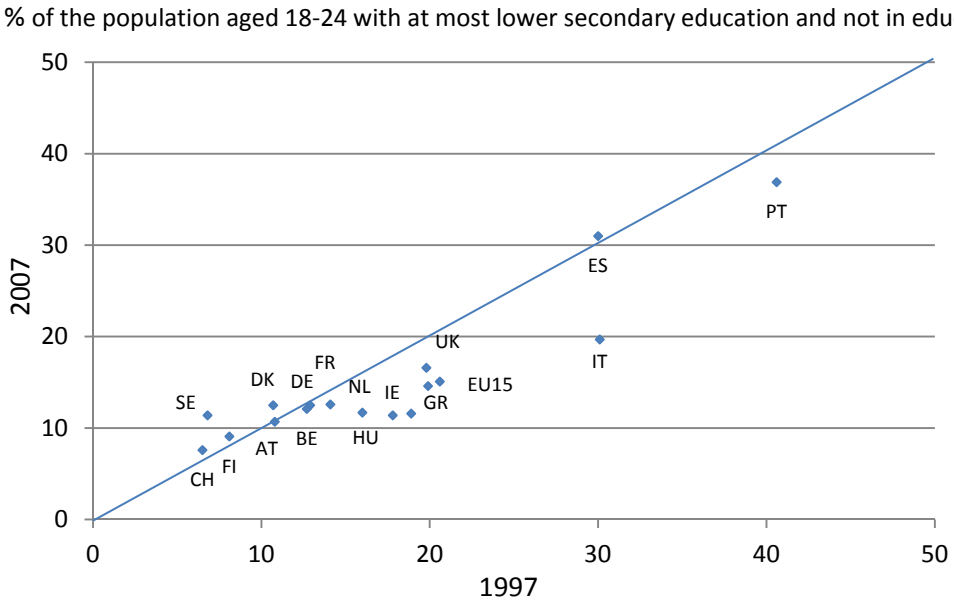
- Measure for dropout earnings: the ratio between the expected earnings at age of 30 of educational level 1 and 3 (*earnings gap*).
- The proportion of students of 15 years old that are studying in their corresponding year (*adequacy rate at 15*).
- Regional unemployment rates.
- Employment share in construction.
- Annual percentage change of the regional PIB.
- Educational competences: a dummy one for those regions who have competences in education.

Figure 1: Evolution of school dropouts in Spain. 1992-2011.



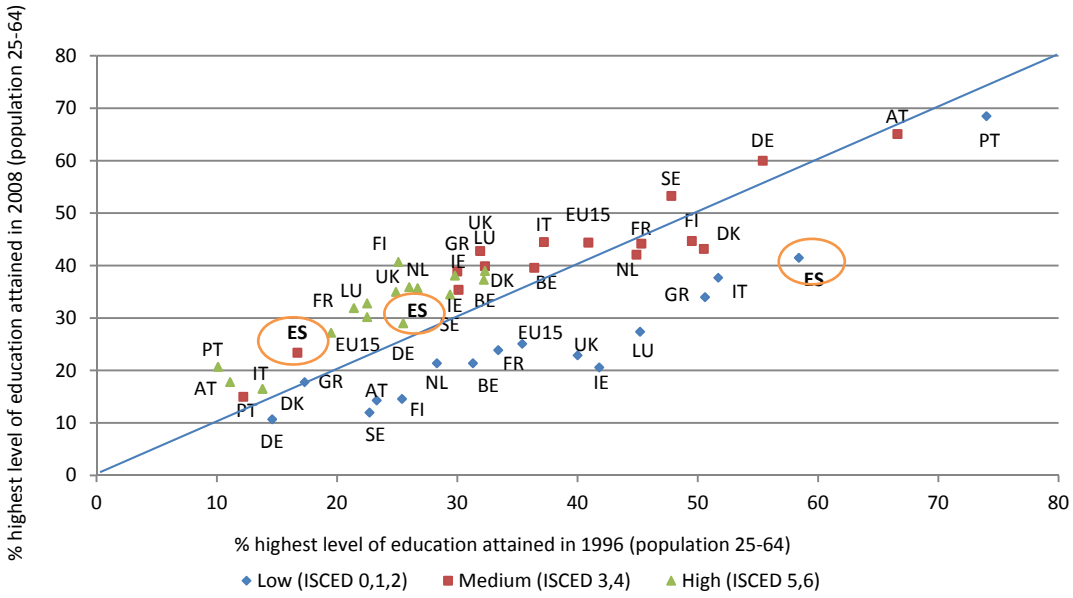
Source: European Labour Force Survey (Eurostat).

Figure 2: Evolution of Early School Leavers by Country (1997, 2007)



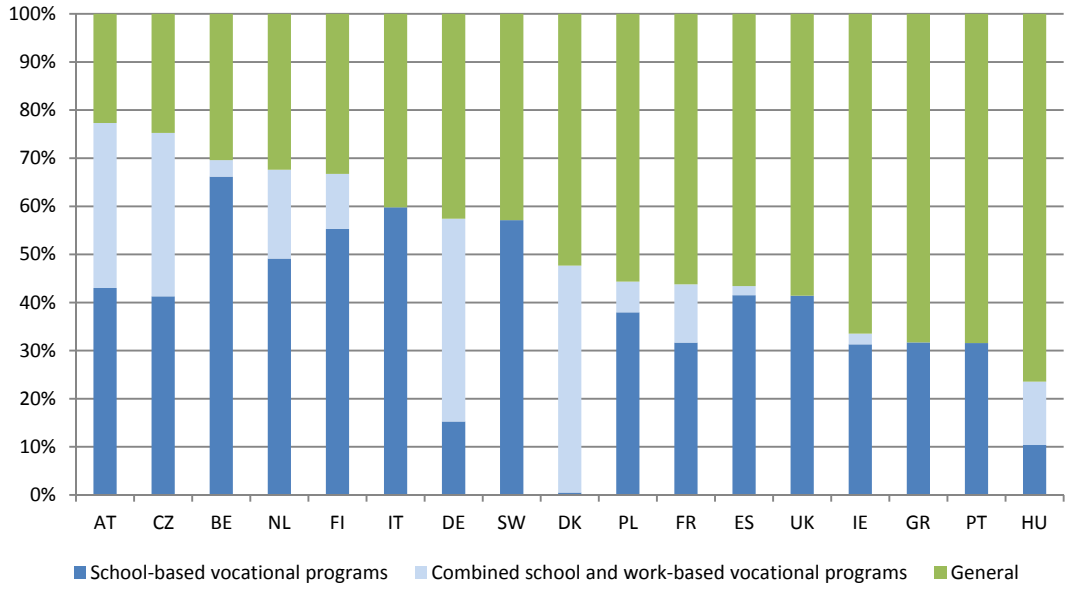
Source: European Labour Force Survey (Eurostat).

Figure 3: Composition of the Population by Educational Levels in EU 15 (population aged 25-64, 1996-2008)



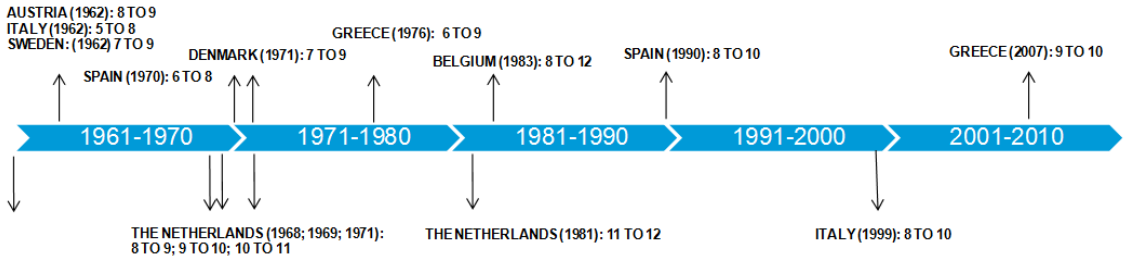
Notes: Lower level corresponds to the % of population with at most lower secondary education; higher level means the % of population with tertiary education (first or second stage). Source: European Labour Force Survey (Eurostat).

Figure 4: Distribution of Upper Secondary Education (2007)



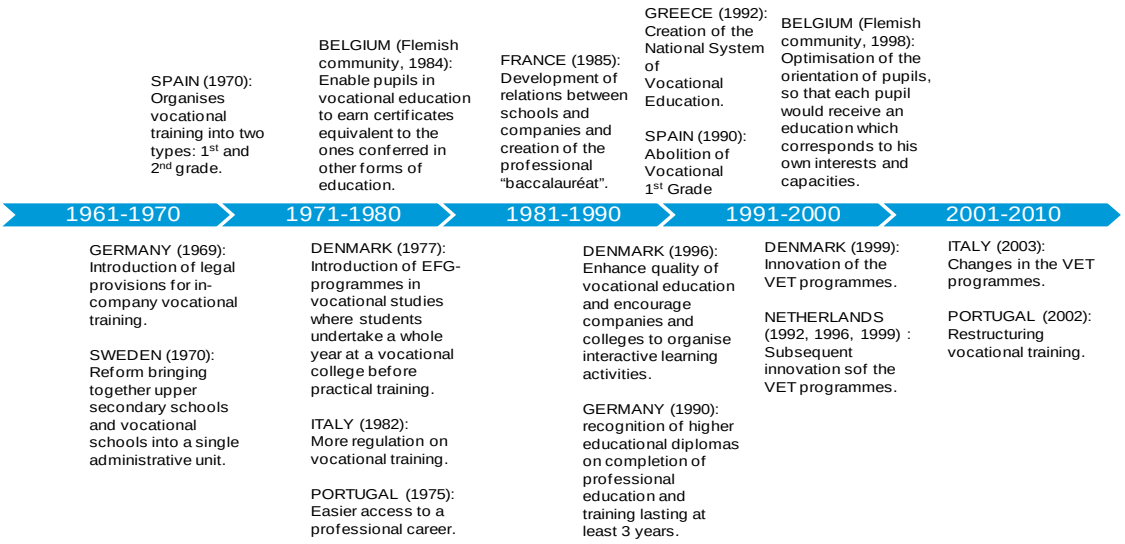
Notes: Lower level corresponds to the % of population with at most lower secondary education; higher level means the % of population with tertiary education (first or second stage). Source: OECD (2008) and own calculations.

Figure 5. Reforms in compulsory years of schooling



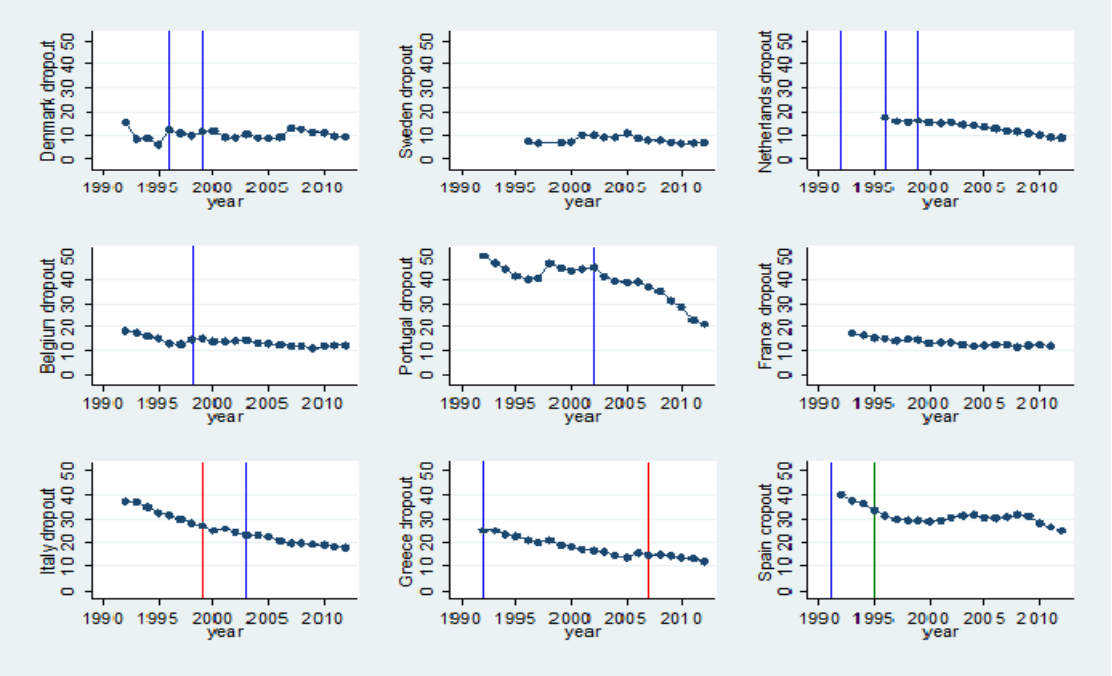
Source: Garrouste (2011).

Figure 6. Main organisational and curricular laws in secondary and post-secondary non-tertiary in Europe



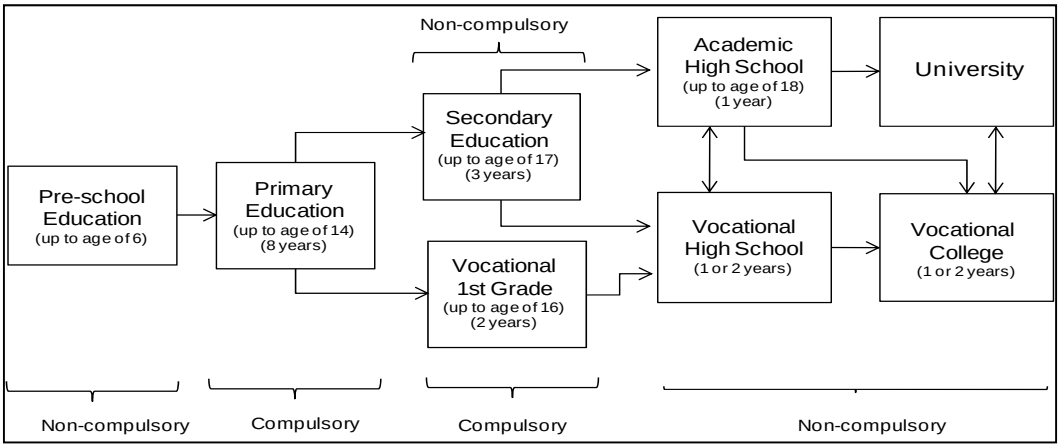
Source: Garrouste (2011).

Figure 7. Evolution of dropout and main reforms in Europe

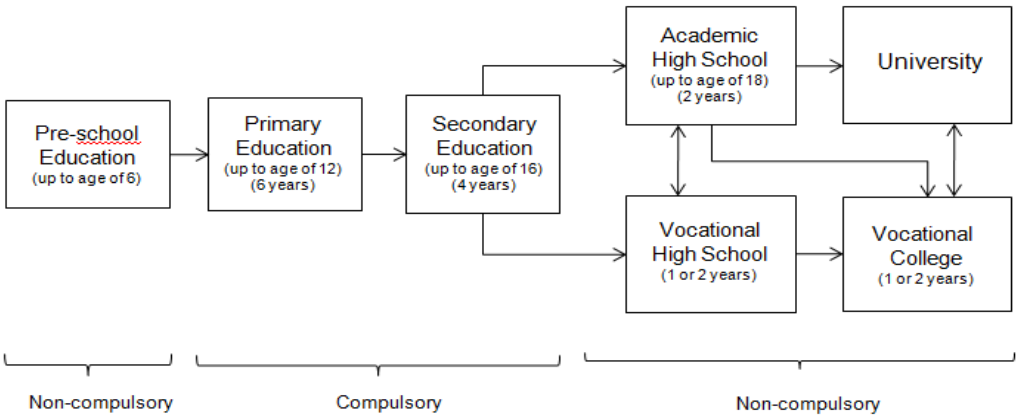


Source: Garrouste (2011), Eurostat and own calculations.

Figure 8. Schooling levels in Spain under the LGE and the LOGSE



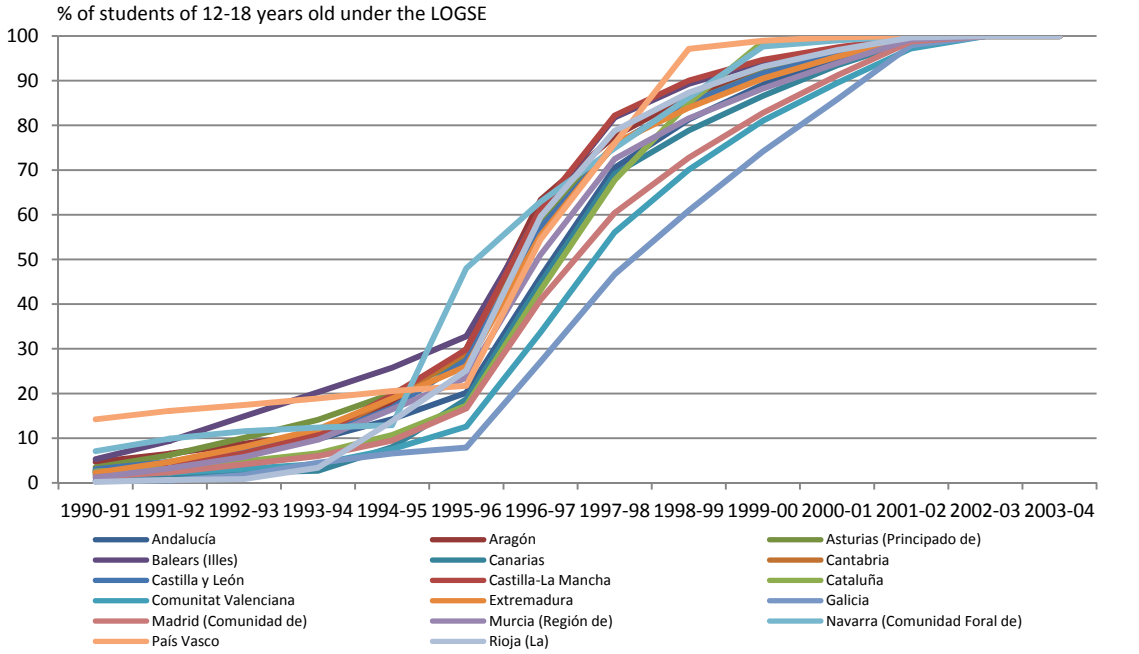
LGE

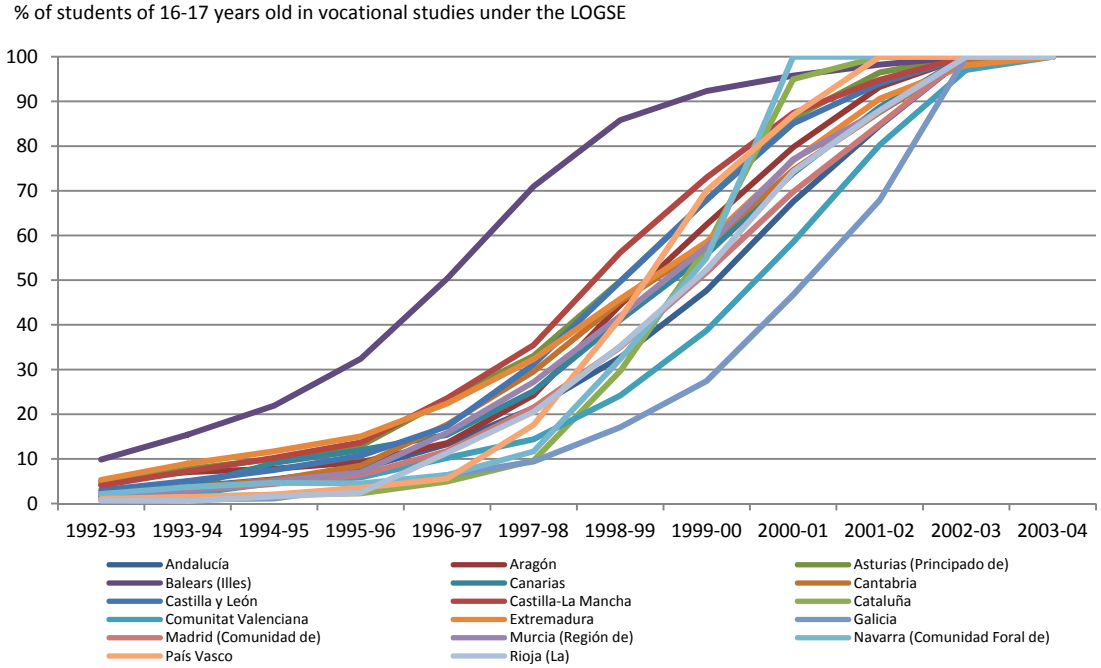


LOGSE

Source: López-Mayan (2010) and own elaboration.

Figure 9. Fraction of the 12-17 population enrolled under the LOGSE





SOURCE: Ministry of Education and own calculations.

Table 1: The Role of the Educational System (2007)

		Distribution of Upper Secondary Education		
		Weight of Vocational Studies		
		High	*Medium*	*Low*
Distribution of Vocational Programs	*High Work-based*	Austria , Czech Republic	Germany, Denmark, France	
	Medium Work-based	Belgium, Netherlands, Finlandia	Poland, Spain	Ireland, Hungary
	Low Work-based	Italy	Sweden	United Kingdom, Greece, Portugal

Source: Field et al. (2007) and own calculations.

Table 2. Descriptive statistics

	Males		**Females**	
	Mean	**St.dev.**	**Mean**	**St.dev.**
Dropout	0.368	0.483	0.230	0.421
Vocational track	0.251	0.433	0.198	0.398
Demographics				
Born abroad	0.022	0.148	0.029	0.167
Father present	0.830	0.375	0.798	0.402
Mother present	0.917	0.275	0.884	0.320
Father dropout	0.454	0.497	0.443	0.497
Mother dropout	0.548	0.498	0.530	0.499
Cohort size	0.990	0.111	0.988	0.112
Regions				
Andalucía	0.204	0.402	0.206	0.405
Aragón	0.040	0.196	0.040	0.195
Asturias	0.024	0.153	0.025	0.155
Balears (Illes)	0.022	0.146	0.021	0.145
Canarias	0.057	0.232	0.057	0.232
Cantabria	0.024	0.154	0.023	0.149
Castilla y León	0.078	0.269	0.076	0.265
Castilla-La Mancha	0.096	0.294	0.097	0.296
Cataluña	0.095	0.293	0.094	0.291
Comunitat Valenciana	0.083	0.277	0.086	0.280
Extremadura	0.040	0.197	0.042	0.200
Galicia	0.064	0.245	0.065	0.247
Madrid	0.057	0.233	0.056	0.230
Murcia	0.035	0.184	0.033	0.179
Navarra	0.020	0.140	0.021	0.142
País Vasco	0.048	0.213	0.047	0.212
LaRioja	0.013	0.113	0.012	0.110
Labour market and business cycle				
Expected real wage ratio at age 30	1.696	0.224	2.061	0.213
Employment in construction	0.103	0.019	0.103	0.019
Regional unemployment rate	0.204	0.067	0.204	0.068
Rate of regional VA growth	0.023	0.019	0.023	0.019
Educational Model				
Competences in education	0.394	0.470	0.387	0.469
Adequacy rate at age 15	65.564	8.008	76.626	6.571
Incidence of the LOGSE				
% students in LOGSE 12-17	0.392	0.319	0.391	0.319
% students in FP-I	0.104	0.072	0.105	0.072
% students in ESO-I	0.350	0.429	0.348	0.429
Observations	53738		51884	

SOURCE: Individual data from Spanish Labour Force Survey (EPA). Educational variables from the Ministry of Education (MEC). Rest of the variables from www.ine.es.

Table 3. Probability of being dropout. Individuals aged 18-24 interviewed between 1995 and 2010. Marginal effects.

	Males		Females	
	(1)	(2)	(1)	(2)
Demographics				
Born Abroad	0.1036***	0.1037***	0.0699**	0.0694**
	(3.019)	(3.026)	(2.006)	(1.997)
Father present	-0.1899***	-0.1900***	-0.1624***	-0.1623***
	(-22.795)	(-22.803)	(-19.794)	(-19.740)
Mother present	-0.1420***	-0.1420***	-0.2094***	-0.2095***
	(-13.457)	(-13.482)	(-16.726)	(-16.731)
Father dropout	0.1918***	0.1919***	0.1165***	0.1165***
	(21.240)	(21.219)	(14.037)	(14.044)
Mother dropout	0.0976***	0.0976***	0.0801***	0.0800***
	(16.828)	(16.858)	(14.694)	(14.675)
Cohort effect	0.0925	0.1107	0.1291	0.0923
	(1.290)	(1.496)	(1.574)	(1.186)
Labour Market and Business Cycle				
Expected real wage	0.0156	0.0207	-0.0499***	-0.0492***
ratio, workers age 30	(0.410)	(0.574)	(-3.237)	(-2.997)
Share of employment	0.1821	0.0527	-0.5081	-0.3097
in construction	(0.478)	(0.134)	(-1.298)	(-0.821)
Unemployment rate	0.3080	0.3397	0.3940***	0.3831***
	(1.295)	(1.429)	(3.361)	(3.078)
Regional growth rate	0.3840	0.3451	0.0625	0.1006
	(1.421)	(1.248)	(0.236)	(0.378)
Educational Model				
Educational	-0.0300	-0.0282	-0.0103	-0.0151
competences	(-1.345)	(-1.398)	(-0.332)	(-0.509)
Adequacy rate at age 15	-0.0016	-0.0011	0.0008	0.0007
	(-1.517)	(-1.138)	(0.491)	(0.417)
Incidence of the LOGSE				
% studying LOGSE	0.1344		-0.1831**	
	(1.019)		(-3.226)	
% studying FP-I	-0.0132	-0.0555	-0.2393**	-0.1562*
	(-0.111)	(-0.494)	(-2.439)	(-1.680)
% studying ESO-I		0.1254***		-0.0827*
		(2.745)		(-1.827)
R-squared	0.064	0.064	0.078	0.078
Observations	53738	53738	51884	51884

NOTES: The difference between (1), (2) and (3) relies in the set of educational indicators included in the specification. ***significant at 1%; **significant at 5%; *significant at 10%. Omitted variables: regional & cohort dummies. Marginal effects after probit estimation. Standard errors clustered by region.

Table 4. Robustness checks. No immigrants and 2000+ sample with quarter of birth. (Marginal effects)

	Males				Females			
	No immigrants		Interviews 2000+		No immigrants		Interviews 2000+	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Demographics								
Born Abroad			0.1030***	0.1032***			0.0731**	0.0726**
			(3.15)	(3.16)			(2.13)	(2.12)
Father present	-0.1937***	-0.1938***	-0.1708***	-0.1709***	-0.1666***	-0.1665***	-0.1434***	-0.1434***
	(-22.87)	(-22.88)	(-21.25)	(-21.30)	(-19.03)	(-18.99)	(-17.70)	(-17.65)
Mother present	-0.1580***	-0.1579***	-0.1383***	-0.1382***	-0.2159***	-0.2161***	-0.2009***	-0.2009***
	(-16.52)	(-16.58)	(-12.70)	(-12.72)	(-17.41)	(-17.42)	(-15.00)	(-15.00)
Father dropout	0.1926***	0.1928***	0.1775***	0.1776***	0.1162***	0.1161***	0.1047***	0.1047***
	(21.60)	(21.58)	(20.87)	(20.81)	(14.63)	(14.65)	(12.44)	(12.45)
Mother dropout	0.0982***	0.0983***	0.0884***	0.0885***	0.0797***	0.0797***	0.0707***	0.0706***
	(17.38)	(17.42)	(13.56)	(13.55)	(16.29)	(16.26)	(12.69)	(12.66)
Cohort effect	0.0724	0.0913	0.0759	0.0754	0.1296	0.0893	0.1059	0.0769
	(0.98)	(1.22)	(1.05)	(1.00)	(1.47)	(1.04)	(1.29)	(0.99)
Labour Market and Business Cycle								
Expected real wage	0.0064	0.0122	0.0469	0.0591	-0.0437**	-0.0422**	-0.0334**	-0.0332**
ratio, workers age 30	(0.16)	(0.32)	(1.04)	(1.39)	(-2.56)	(-2.34)	(-2.33)	(-2.15)
Share of employment	0.1884	0.0553	0.0091	-0.0395	-0.4503	-0.2404	-0.4329	-0.2584
in construction	(0.48)	(0.13)	(0.02)	(-0.10)	(-1.12)	(-0.59)	(-1.29)	(-0.81)
Unemployment rate	0.3074	0.3439	0.3696	0.4379*	0.3349***	0.3285**	0.4585***	0.4539***
	(1.24)	(1.39)	(1.39)	(1.88)	(2.87)	(2.40)	(4.04)	(4.37)
Regional growth rate	0.3868	0.3449	0.4058	0.3586	0.0907	0.1278	-0.0412	-0.0102
	(1.40)	(1.22)	(1.18)	(1.05)	(0.34)	(0.47)	(-0.16)	(-0.04)
Educational model								
Competences in	-0.0346	-0.0330	-0.0209	-0.0221	-0.0054	-0.0111	-0.0118	-0.0173
education	(-1.42)	(-1.50)	(-0.93)	(-1.10)	(-0.17)	(-0.36)	(-0.35)	(-0.54)
Adequacy rate 15	-0.0015	-0.0011	-0.0014*	-0.0007	0.0005	0.0005	0.0003	0.0002
	(-1.44)	(-1.04)	(-1.70)	(-0.98)	(0.32)	(0.29)	(0.17)	(0.11)
Incidence of the LOGSE								
% studying LOGSE	0.1402		0.0634		-0.1911***		-0.1637**	
	(1.01)		(0.46)		(-3.28)		(-2.20)	
% studying FP-I	-0.0164	-0.0600	-0.1174	-0.1087	-0.1756	-0.0823	-0.2356**	-0.1665*
	(-0.13)	(-0.53)	(-0.97)	(-0.98)	(-1.61)	(-0.77)	(-2.13)	(-1.66)
% studying ESO-I		0.1364***		0.1618***		-0.0553		-0.0762
		(2.91)		(3.69)		(-1.33)		(-1.50)
Quarter of birth								
2nd quarter			-0.0103	-0.0105			0.0025	0.0024
			(-1.40)	(-1.41)			(0.35)	(0.33)
3rd quarter			0.0099	0.0100			0.0103*	0.0102*
			(1.30)	(1.32)			(1.70)	(1.69)
4th quarter			0.0215***	0.0215***			0.0031	0.0031
			(3.53)	(3.53)			(0.48)	(0.47)
R-squared	0.07	0.07	0.06	0.06	0.08	0.08	0.08	0.08
Observations	52531	52531	45400	45400	50393	50393	43919	43919

NOTES: The difference between (1) and (2) relies in the set of educational indicators included in the specification. ***significant at 1%; **significant at 5%; *significant at 10%. Omitted variables: regional & cohort dummies. Marginal effects after probit estimation. Standard errors clustered by region.

Table 5. Track choice: the probability of taking vocational studies after compulsory education (marginal effects). Full sample (18-24) that has completed compulsory education.

	Males		Females	
	(1)	(2)	(1)	(2)
Demographics				
Born Abroad	-0.0464*	-0.0464*	-0.0793***	-0.0793***
	(-1.81)	(-1.81)	(-5.54)	(-5.53)
Father present	-0.0633***	-0.0632***	-0.0555***	-0.0555***
	(-7.25)	(-7.24)	(-7.87)	(-7.84)
Mother present	-0.0425***	-0.0426***	-0.1035***	-0.1036***
	(-3.64)	(-3.67)	(-12.47)	(-12.45)
Father dropout	0.0632***	0.0633***	0.0503***	0.0503***
	(7.03)	(7.07)	(5.75)	(5.73)
Mother dropout	0.0140	0.0140	0.0079	0.0080
	(1.57)	(1.57)	(1.06)	(1.06)
Cohort effect	0.1600**	0.1740**	0.1644***	0.1691***
	(2.10)	(2.15)	(4.34)	(3.82)
Labour Market and Business Cycle				
Expected real wage ratio,	-0.0218	-0.0223	-0.0446***	-0.0432***
workers age 30	(-0.77)	(-0.85)	(-2.85)	(-2.74)
Share of employment	-0.3834	-0.5175	-0.4537	-0.4826
in construction	(-0.99)	(-1.36)	(-1.29)	(-1.35)
Unemployment rate	0.0805	0.0570	0.5190**	0.5319***
	(0.35)	(0.23)	(2.55)	(2.64)
Regional growth rate	-0.0979	-0.1086	0.3611*	0.3422
	(-0.30)	(-0.33)	(1.65)	(1.57)
Educational model				
Competences in	0.0239	0.0296	0.0296	0.0298
Education	(0.62)	(0.84)	(0.88)	(0.99)
Adequacy rate 15	-0.0002	-0.0002	-0.0005	-0.0003
	(-0.18)	(-0.16)	(-0.40)	(-0.26)
Incidence of the LOGSE				
% studying LOGSE	0.1193		0.0333	
	(1.19)		(0.28)	
% studying FP-I	0.2817*	0.2392	0.4093***	0.4059***
	(1.81)	(1.56)	(3.38)	(2.88)
% studying ESO-I		0.0277		0.0511
		(0.78)		(1.22)
R-squared	0.02	0.02	0.02	0.02
Observations	33988	33988	39941	39941

NOTES: The difference between (1) and (2) relies in the set of educational indicators included in the specification. ***significant at 1%; **significant at 5%; *significant at 10%. Omitted variables: regional & cohort dummies. Marginal effects after probit estimation. Standard errors clustered by region.

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