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Enrolment in Higher Education during the Economic Crisis in Spain

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Abstract

The enrolment in higher education in Spain has followed an upward trend since the outbreak of the Great Recession in 2008. Since we know that not all sections of the Spanish population are being affected equally by the economic crisis, the main objective of this research is to find out how different socio-economic characteristics have affected the enrolment in higher education in Spain during the period of economic crisis. Researching the family reality will allow us to conclude whether this upward trend can be generalized or, on the contrary, is actually misleading.

The variables used to carry out the research have been chosen from the data pertaining to the Barometer March 2012 by the Centre for Sociological Research from Spain. The dependent variable has been transformed into a dummy variable, which takes the value of (1) to indicate the presence of higher education and (0) to indicate the absence of higher education. The independent variables are related to some socio-economic characteristics of the parents of children studying in higher education or not, which can be influenced by the economic crisis. The method used for conducting the research is the logistic regression, controlling for the effect of provinces.

According to the results obtained, this upward trend of enrolment in higher education cannot be generalized to families with certain socio-economic characteristics, such as some categories of occupations or social classes. Moreover, a high as well as a low provincial unemployment rate have a significantly negative effect on enrolment in higher education.

Keywords: enrolment, higher education, economic crisis, family level, socio-economic characteristics, provincial unemployment rate, logistic regression.

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List of Abbreviations

AACC – Autonomous Communities

CIS – *Centro de Investigaciones Sociológicas* (Centre for Sociological Research)

DK/DA – Do not know / Do not answer

EAPS – Economically Active Population Survey

EU – European Union

GDP – Gross Domestic Product

NSI – National Statistics Institute

OECD – Organisation for Economic Co-operation and Development

UNESCO – United Nations Educational, Scientific and Cultural Organization

USA – United States of America

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Chapter 1

INTRODUCTION

1.1. Problem Statement and Academic and Social Relevance

Since 2008, Europe has been facing an economic crisis that first emerged in summer 2007 in the United States of America (USA). After the failure in September 2008 of Lehman Brothers, one of the global financial services firm in the USA taken as a reference worldwide, the most of European countries, as well as the USA, slid into recession. (Barakat et al., 2010)

The main visible consequences of the economic crisis have been the decrease in income and the loss of job, which the majority of the European countries are still experiencing nowadays (Varghese, 2009). In 2011, in the most countries of the Organisation for Economic Co-operation and Development (OECD) and of the European Union (EU), the increasing trend in unemployment, which started during the economic crisis in 2008, continued (National Institute of Educational Evaluation, 2013). However, as the National Institute of Educational Evaluation (2013) points out, the case of Spain stood out from the rest of the countries considering that its unemployment rates at all educational levels almost doubled the average levels of both the OECD and the member states of the EU in 2011. Furthermore, Spain was among the first positions in the ranking of European countries with greater social inequality according to the Gini Index, obtaining a high score of 34 in 2011 (Salido, 2012).

Therefore, focusing on the specific case of Spain, according to the data provided by EUROSTAT, the unemployment rate for the population aged from 15 to 74 years old increased from 9.6% in the first quartile of 2008 until 17.3% in the first quartile of 2009. Currently, the situation has not improved and the last data available provided by the National Statistics Institute (NSI), belonging to the fourth trimester of 2014, show an increase of the unemployment rate until 23.7%. Nevertheless, as usually happens in every economic recession, the different social groups experience the crisis differently (De la Rica, 2009). For instance, the increase in unemployment is experienced differently between certain socio-economic subgroups, underlining the differences among sex, age and educational attainment (Barakat et al., 2010). At present, the data provided by the Economically Active Population Survey (EAPS) for the fourth trimester of 2014 shows the vulnerability of the youth in relation with unemployment. The 67.28% of people aged 16 to 19 years old and the 48.88% of people aged 20 to 24 years old were unemployed. Moreover, the data provided by the EAPS for the fourth trimester of 2014 confirms the importance of being in possession of a higher education degree as an important guarantee to be employed. Whereas the unemployment rate for higher educated population was 14.29%, the unemployment rate for people with primary education was 38.07%.

The crisis has also had an important effect on enrolment in higher education in several countries. However, even though the most of the studies agree that there is a general impact of the economic crisis on enrolment in higher education, there is no common agreement on the way in which the crisis affects this access. Whereas some studies claim that the enrolment in higher education increases during the economic crisis, others claim the opposite effect. Nevertheless, regarding the specific case of Spain, most of the studies and official statistics show a general agreement stating that the rate of enrolment in university has continued an upward trend since the

beginning of the economic crisis in 2008 at national level (National Institute of Educational Evaluation, 2013).

Nonetheless, as previously mentioned, the different social groups experience the crisis differently (De la Rica, 2009). According to the OECD (2013; cited by Martínez García 2014, p. 12), Spain is one of the most affected countries of the OECD by the economic crisis leading to a greater social and economic inequality where the poorest are now poorer due to the crisis and the richest have barely noticed it. Therefore, this general upward trend should not be generalized to all social groups due to the economic crisis may have affected differently according to different socio-economic characteristics. Consequently, there is the need to find out how Spanish citizens at family level, according to different socio-economic characteristics, are experiencing the economic crisis in relation to enrolment in higher education in Spain. Throughout this research, the enrolment in higher education will be studied at family level among different socio-economic characteristics during the period of economic crisis in Spain in order to compare these results with the upward trend at national level. In order to conduct this research, there will be used the data provided by the Barometer of March 2012 by the Centre for Sociological Research (CIS, *Centro de Investigaciones Sociológicas*) from Spain. The data used refers to parents of children in higher education compared to parents with children not studying in higher education. Furthermore, in order to capture the economic crisis at aggregate level, there will be used data on unemployment at regional level.

As United Nations Educational, Scientific and Cultural Organization (UNESCO, 2012) claims, we need to do research on enrolment in higher education during the economic crisis and its future results. In the event that the results obtained by this research at family level were contrary to the results at aggregate level in Spain and, therefore, enrolment in higher education is lower during the economic crisis according to different socio-economic characteristics, it would demonstrate that this general upward trend at national level is actually misleading and so the economic crisis does not favour enrolment in, and pursuing, higher studies for all sections of the population. In addition to the above, it would lead to a greater social distancing, that is there would be people who could not enrol in or pursue higher education due to the effect of the economic crisis causing more social inequality and lack of opportunities. Education can be considered as a "source of intergenerational economic and social inequality, unless well planned" (Varghese 2009, p. 28).

1.2. Research Objective and Research Questions

As previously mentioned, the current economic crisis has an effect on enrolment in higher education within the countries of the OECD (Barakat et al., 2010). Despite the fact that there is no common agreement on the way in which the crisis may affect enrolment in higher education, different studies conducted in Spain conclude that enrolment in higher education is increasing since the beginning of the economic crisis in 2008 (National Institute of Educational Evaluation, 2013).

However, this general upward trend of the enrolment in higher education should not be generalized to all sections of the population since the economic crisis is experienced differently among people with different socio-economic characteristics (De la Rica, 2009). Subsequently, the main objective of the present study is to find out how different socio-economic characteristics

have affected the enrolment in higher education in Spain during the period of economic crisis. Since we know that enrolment in higher education follows an upward trend at national level since the beginning of the economic crisis in Spain, it would be interesting to research the reality at family level in order to conclude whether this upward trend can be generalized or, on the contrary, is actually misleading. It should be pointed out that higher education here refers to university.

The objective presented previously is redefined into a broad central question: How has the economic crisis, as indicated by the unemployment at the regional level, affected the enrolment in higher education in Spain?

This central question will be answered by addressing several related descriptive and explanatory sub-questions:

- What was the situation of enrolment in higher education before the beginning of the economic crisis in 2008 in Spain?
- How has enrolment in higher education in Spain evolved from the beginning of the economic crisis in 2008 until the most recent available point in time?
- What are the individual, family and contextual variables that explain the enrolment in higher education in Spain?
- Could the general upward trend of enrolment in higher education be generalized to all sections of the population according to certain socio-economic characteristics in Spain?
- How is the family socio-economic position related to the economic crisis in Spain as indicated by the regional levels of unemployment?

1.3. Structure of the Paper

This paper is divided into five chapters. *Chapter 1: Introduction* has been presented previously, explaining the problem statement, the social and academic relevance, the objective of this study and the research questions. *Chapter 2: Theoretical Framework* consists of the literature review, the theories used throughout the conduction of this study, the hypotheses and the conceptual model. *Chapter 3: Data and Methods* shows the data used to conduct this research, summarizing the most relevant information. Moreover, the method used to do the analysis is explained in detail. *Chapter 4: Results* shows the results obtained from the analysis of the data. Finally, *Chapter 5: Conclusion and Discussion* sets out the conclusions of the analysis conducted, refuting or proving the different hypotheses and answering the research questions. Moreover, this chapter gathers some ideas for possible future investigations.

Chapter 2

THEORETICAL FRAMEWORK

2.1. Literature Review, Theories and Hypotheses

Throughout this section, the most relevant literature related to the topic of this study, the theories used to conduct this research and the hypotheses emanated from this review are presented in order to form a general idea of the state of interest and to provide an explanation to the main research question (How has the economic crisis, as indicated by the unemployment at the regional level, affected the enrolment in higher education in Spain?). Firstly, the evolution of enrolment in higher education before and after the beginning of the economic crisis will be explained. Secondly, the most relevant factors in explaining enrolment in higher education will be presented in general. Thirdly, the effect of the economic crisis on these factors will be explained, specifying the factors that will be used throughout this study and the hypotheses derived from this literature review. Finally, the conceptual model of the present study will be described.

2.1.1. Evolution of enrolment in higher education in Spain: from the beginning of the economic crisis in 2008 until the most recent available point in time

The current economic crisis has become a global crisis that affects "both middle-income and low-income countries" of the world, entailing an increase of the unemployment and a decrease in citizens' income (Varghese 2009, p. 5). In addition, this crisis has implied the "reduction in funding for education from all sources (government, private sector and households)" (Varghese 2009, p. 5). As Varghese (2010) claims, we can reduce to three the aspects on which the impact of the economic crisis on higher education depends:

- "The government and its public policy response". Even though this point varies among countries, the responses could be summarized as follows: policies aimed to reduce the public funding; policies aimed to increase the public funding of higher education; and, finally, policies directed towards maintain the public funding.
- "Higher education institutions and their responses". The government support, the donations and contributions, the savings and the student's income tend to decline. Nevertheless, this point may be closely connected to the previous one in those countries where most higher education is public.
- "The households and their responses". Many families cannot afford the payment of the university due to the decrease in their incomes. However, there are different ways of facing the situation: reducing the consumption in general, including higher education; maintaining their investment in education reorganising their expenses; increasing their demand of higher education as an investment; increasing their demand of higher education in response to the unemployment; and make a substitution between public and private institutions.

According to Barakat et al. (2010), the economic crisis may affect enrolment in higher education in different and contradictory ways. On one hand, students who are financially dependent on their parents may face a shortfall in the event that their parents see their income reduced due to, for instance, unemployment. On the other hand, enrolment in higher education may be encouraged

by unemployment, seeking to improve skills and qualifications and, therefore, increase the likelihood of being hired.

Focusing on the specific case of Spain, although Spanish universities charge tuition fees, there are three kinds of grants in order to provide equal opportunity in enrolment in higher education for all students: "compensating grants" for covering the direct cost of studies as well as the opportunity cost; "direct cost grants to cover extra costs"; and "fee grants" (Mora, 1996). It should be also pointed out that Spain is one of the countries with the highest equality in terms of parents' educational attainment level. For instance, according to the data provided by EUROSTAT for 2000, the odds of students graduating from tertiary education with parents with tertiary studies (ISCED 5-6) were only 2 times larger than the odds for students graduating from tertiary education with parents with primary and lower secondary studies (ISCED 1-2), ranking just behind countries such as Sweden (1.9) and Finland (1.1), which occupy the top positions of equality in terms of parents' educational attainment level, and ahead of countries such as France (2.4), Belgium (3) and Italy (6.9), among others. This suggests that there are more chances for upward mobility in Spain in comparison with other European countries. However, what happens in times of crisis when there may be still a different effect for better and less well of families?

Moreover, despite the raise in university tuition fees after the beginning of the economic crisis in 2008, Spain is one of the countries with relatively low fees in higher education, with an average of 1075 Euros per year for the 2010-2011 academic year, standing below the Nordic Countries and the Netherlands, among others (National Institute of Educational Evaluation, 2013). In addition, the percentage of students who received grants or public loans for the same academic year was 35% (National Institute of Educational Evaluation, 2013). As shown in Figure 1, the financial aid to students in higher education has kept more or less stable over the years at European level and in Spain. The highest percentage of financial aid to students of tertiary education in Spain is recorded at the beginning of the economic crisis in 2008, being a 9.9% of the total public expenditure on education. Moreover, since the beginning of the economic crisis in 2008, the percentage of financial aid has kept at higher levels than before the crisis. However, compared to the European level, the financial aid to students of tertiary education in Spain is actually low, being about two times lower as financial aid at European level.

Figure 1. Financial aid to students as % of total public expenditure on education, at tertiary level of education (ISCED 5-6), Spain and EU-28

Data source: EUROSTAT. Data extracted on March 15th 2015.
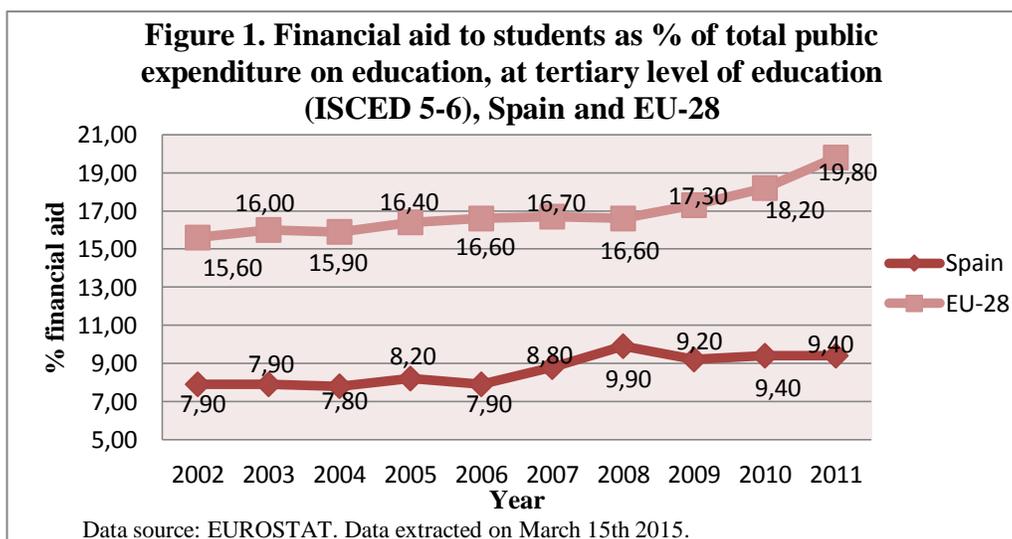
According to data provided by EUROSTAT, before the beginning of the economic crisis, there was a slight decrease in the total number of students enrolled in higher education in Spain, from 1,809,400 students in 2005 to 1,777,500 in 2007. Figure 2 shows the trends in the number of students in higher education in Spain from 2000 until 2012. Since the beginning of the economic crisis in 2008, there has been a sharp increase of people studying tertiary education at Spanish universities. In 2008, the total number of students in higher education was 1,781,000; whereas in 2012, 1,956,800 students were enrolled at Spanish universities. These numbers are in line with the statistics at European level (EU-28), which show an increase from 19,180,600 students in higher education in 2008 until 20,245,900 students in 2012. This may be due to different causes: the delayed entry of young people into the labour market, extending the stage of academic training due to the high rate of unemployment; the implementation of Bologna process, which has shortened some university programs encouraging their realization; and, finally, a cohort effect of a larger cohort that finishes high school studies (National Institute of Educational Evaluation, 2013). However, despite the overall increase in enrolment in higher education, there might be individuals who have had to interrupt, postpone or abandon their tertiary studies as a result of economic difficulties due to the economic crisis (Barakat et al., 2010).

Figure 2. Trends in the number of students in higher education (ISCED 5-6), Spain (x1000)

Data source: EUROSTAT. Data extracted on March 2nd 2015.
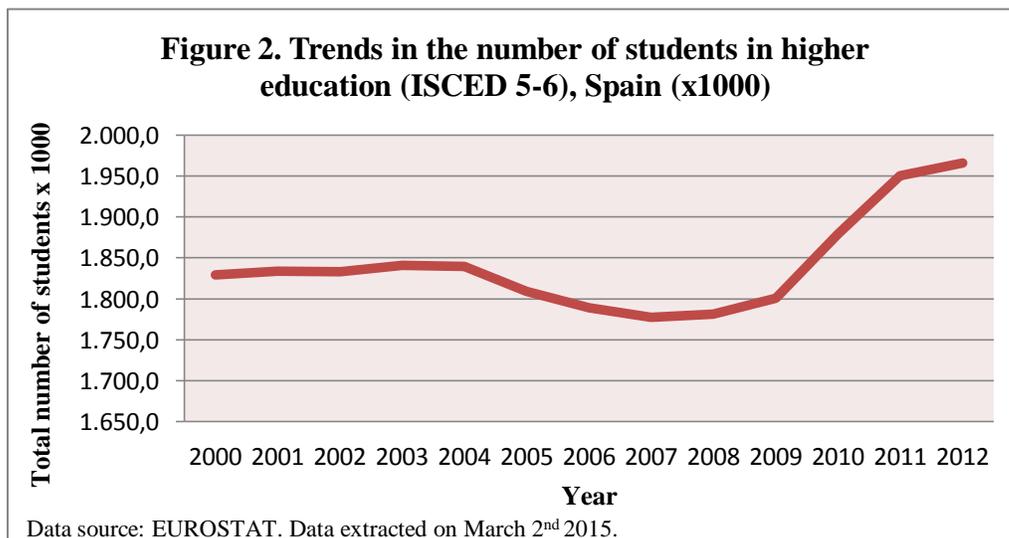
2.1.2. Explaining enrolment in higher education in Spain: explanatory factors

Over the past years, there has been carried out many researches in order to explain the factors that have an influence on enrolment in higher education in Spain, theoretically as well as empirically (Rincón Díez 2014). Following the differentiation made by Pérez-Esparrells et al. (2013), the factors used to explain enrolment in higher education in Spain will be classified in individual/personal, family and contextual factors, summarizing the most significant results achieved by the most relevant studies on this topic.

2.1.2.1. Individual/Personal factors

Regarding the individual/personal factors, the most of the studies agree in pointing out that the most relevant factors to explain enrolment in higher education in Spain are:

- *Gender.* According to the results obtained by Pérez-Esparrells et al. (2013), who use data from the Statistics on Income and Living Conditions Spanish survey for 2006 and 2010,

women have a greater probability of demanding and accessing to higher education. The same conclusion was reached by Gil Izquierdo et al. (2010), who analyse the data provided by the Survey of Living Conditions from Spain for the period 2005. Moreover, this effect is not only for Spain, since the most of the countries of the OECD present higher rates of enrolment in higher education among women. Economic Theory can be used to try to explain the relationship between gender and enrolment in university. It is known that education improves prospects of finding a job, i.e., the higher the education level reached, the higher the probability of finding a job. Investment in education could generate major benefits for women, which may explain their higher rate of enrolment in higher education. On one hand, this may be due to their improved productivity (Human Capital Theory) or, on the other hand, due to the signals sent to employers (Signalling Theory).

- *Nationality.* According to the most recent researches in including nationality as explanatory factor, foreigners are less likely to enrol in higher education in Spain than nationals (Gil Izquierdo et al., 2010). However, their results do not show a significant effect of this characteristic.

2.1.2.2. Family factors

In relation with the family factors, the most relevant ones used to explain enrolment in higher education in Spain, which generally measure socio-economic position, are the following:

- *Highest parents' level of education.* As stated by Rahona (2006, cited by Gil Izquierdo et al. 2010, p. 77), there are four ways in which the educational level of household members can influence the individual demand and enrolment in higher education: firstly, innate ability children inherited by parents; secondly, educational level as a alternative for household income; thirdly, influence on the preferences of the children; and finally, educational intergenerational transmission. This factor seems to have a positive effect on enrolment in higher education when parents have reached higher education (Gil Izquierdo et al., 2010). In addition, several studies show a greater influence of the mother's level of education compared to the father's level of education (Pérez-Esparrells et al., 2013). However the findings of the paper written by Pérez-Esparrells et al. (2013) suggest that, despite the fact that there is still a greater probability among children with parents with higher education to enrol in higher education in comparison with children with parents with secondary or lower level of education, the importance of this positive effect is reduced since the beginning of the economic crisis.

- *Family/Household income.* This factor is usually included in the analysis of the determinants of education. The main idea is based on the assumption that the more income available, the more likely to enrol in higher education (Petrongolo and San Segundo, 1999; Modrego, 1987; cited by Gil Izquierdo et al. 2010, p. 77). This idea is based on the Economic Theory, from which we can conclude that the higher the revenues, the lower the costs (direct, indirect and opportunity) of enrolment in the university (Pérez-Esparrells et al., 2013). Based on the Human Capital Theory, the family income does not appear as one of the variables that affect the demand for higher education if it is viewed purely as an investment (Petrongolo and San Segundo, 1999). However, according to Petrongolo and San Segundo (1999), family income does affect the enrolment in higher education if any of the following situations are given:

- o If education is understood as consumption itself (General Theory of Keynes), allowing the achievement of social status, among others (Kodde and Ritzen, 1984; cited by Petrongolo and San Segundo 1999, p. 15).
- o If decisions are made under conditions of uncertainty, based on the perceived risk (Kodde, 1986; cited by Petrongolo and San Segundo 1999, p. 15).
- o If the costs of investing in education vary according to the disposable family income due to the imperfections of capital markets (Kodde and Ritzen, 1985; cited by Petrongolo and San Segundo 1999, p. 15).

Nevertheless, the result obtained by the analysis carried out by Gil Izquierdo et al. (2010) show that the effect of family income on enrolment in higher education is not statistically significant. On the other hand, the findings obtained by Pérez-Esparrells et al. (2013), who take into consideration the interaction of the highest parents' level of education and family income, demonstrate that there is a positive effect on enrolment in higher education among those with a high family income and parents with higher education.

- *Occupation of the parents.* Although not all the papers use the same classification of occupation of the parents, it can be seen that in general, the studies find a positive and significant effect of occupational level on enrolment in higher education (Pérez-Esparrells et al., 2013). Therefore, it is expected a greater enrolment in higher education for those children whose parents are professionals or managers compared to those whose parents are unskilled workers (Gil Izquierdo et al., 2010; Pérez-Esparrells et al., 2013). Based on the results obtained by Pérez-Esparrells et al. (2013), the interaction between family income and occupation of parents shows a larger positive effect of family income on enrolment in higher education when parents work as directors, technicians and office workers. Moreover, a working status instead of an unemployed status shows a larger enrolment in higher education (Gil Izquierdo et al., 2010). On the other hand, a larger *proportion of unemployed* at home causes a negative effect on enrolment in higher education (Gil Izquierdo et al., 2010). Regarding the differences between the effect of the occupation of the mother and the occupation of the father, some studies conclude that among those families where the father is employed, the probability of enrolling in higher education is greater, being the effect of the occupation of the mother lower (Pérez-Esparrells et al., 2013).
- *Social Class*. It is observed that the higher the social scale, the greater the enrolment in higher education (Rodríguez, 1992; Peraita and Sánchez, 1998; cited by Pérez-Esparrells et al. 2013, p. 8).
- *Having siblings*. On one hand, younger siblings may affect negatively the enrolment in higher education due to they could be seen as an additional economic burden (Behrman et al., 1989; cited by Gil Izquierdo et al. 2010, p. 78). On the other hand, older siblings may assume some responsibilities at home, freeing younger sibling so they can study. The first hypothesis is supported by the analysis performed by Gil Izquierdo et al. (2010), showing a negative effect on enrolment in higher education when younger siblings are present.

2.1.2.3. Contextual factors

The contextual factors that seem to be most relevant in order to explain enrolment in higher education in Spain are:

- *General and youth unemployment.* This factor operates both at the individual and family level and at the aggregate level. The education level plays an important role in the probability of experiencing unemployment: whereas only the 7% of workers with higher education were unemployed at the beginning of the economic crisis in Spain in 2008, 14% of workers without education or with primary education were unemployed (De la Rica, 2009). Therefore, having a higher educational level protects more individuals from job losses, even in periods of economic crisis, generating greater employment prospects (National Institute of Educational Evaluation, 2013). The literature is not consistent regarding the effect of these factors on enrolment in higher education. Regarding the *general unemployment*, theoretically it would be expected that a higher rate of unemployment had a negative effect on enrolment in higher education due to, on one hand, a worse economic situation which made less profitable the investment in higher education and, on the other hand, the unemployment situation among families which led to a budgetary constraint (Petrongolo and San Segundo, 1999; Petrongolo and San Segundo, 2002; cited by Pérez-Esparrells et al. 2013, p. 10). However, a higher rate of unemployment could also have a positive effect on enrolment in higher education on the basis of the opportunity cost, since finding a job would be more difficult and the opportunity cost of enrolment in higher education or the continuation of higher studies would be lower (De la Rica and San Martin, 1999; cited by Pérez-Esparrells et al. 2013, p. 10). Regarding *youth unemployment*, we would expect that the opportunity cost of enrolment in higher education would be lower; therefore enrolment in higher education would increase (Albert, 2000; cited by Gil Izquierdo et al. 2010, p. 79). However, on one hand, according to Gil Izquierdo et al. (2010), general and youth unemployment do not have a significant effect on enrolment in higher education. On the other hand, Pérez-Esparrells et al. (2013) find a negative effect of the general unemployment on enrolment in higher education. Nonetheless, they note that, although this variable has a negative effect on access, the enrolment in higher education in Spain has never stopped growing since the last years.
- *Unemployment at provincial level.* There are several studies that have examined the effect of the unemployment rate at provincial level on enrolment in higher education, based on the fact that labour mobility is very limited in Spain (Pérez-Esparrells et al., 2013). Until the 80s, the unemployment at provincial level had a positive effect on enrolment in higher education (Mora, 1988; Mora, 1989; cited by Pérez-Esparrells et al. 2013, p. 10). However, this effect has now changed, showing a negative effect of general unemployment at provincial level and a positive effect of youth unemployment at provincial level (Petrongolo and San Segundo, 1999; Petrongolo and San Segundo, 2002; De Pablos and Gil, 2007; cited by Pérez-Esparrells et al. 2013, p. 10), although these effects are not always statistically significant (Pérez-Esparrells et al., 2013). Nevertheless, it should be pointed out that there may be methodological problems related to the geographical scope, that is there may be provinces that constitute local labour markets whereas other provinces may be subsidiary of neighbour poles of economic growth. For instance, the employment level in provinces around Madrid or Barcelona depends on the economy of both provinces.
- *Size of the locality.* In general, the sizes of the locality or the degree of urbanization have a positive effect on enrolment in higher education. However, this effect is not always statistically significant (Petrongolo and San Segundo, 1999; Petrongolo and San Segundo, 2002; De Pablos and Gil, 2007; Gil et al., 2010; cited by Pérez-Esparrells et al. 2013, p.

9), which could be explained as a result of the rising of universities in different locations and the generalization of scholarships nationwide. (Pérez-Esparrells et al., 2013)

In summary, all the papers consulted and presented in this section come to similar conclusions, underlining certain socio-economic factors that have a significant influence on access (and also demand) to higher education in Spain. Among the most important factors in explaining enrolment in higher education in Spain, we can find the highest parents' level of education, being a woman, general and youth unemployment, proportion of unemployed at home and family income. Furthermore, comparing the period before the economic crisis and the period after the economic crisis began, Pérez-Esparrells et al. (2013) find differences in the impact of the parents' level of education and the difference between the effect of the mother and father unemployment. However, the effect that some of these factors have on enrolment in higher education is still not clear. For instance, whereas some studies state that the general unemployment has a positive effect on enrolment in higher education, others find the opposite effect. Moreover, some of these factors do not always have a statistically significant effect.

2.1.3. The effect of the economic crisis on the explanatory factors of enrolment in higher education in Spain

Throughout this section, the explanatory factors of enrolment in higher education in Spain that could have been affected by the economic crisis would be explained. Moreover, the hypotheses of this study are included in this section. All the hypotheses are referenced to the specific Spanish case, at family level and within the period of the economic crisis.

As previously mentioned, at national level, the enrolment in higher education has followed an upward trend since the outbreak of the Great Recession. However, not all the sections of the population have been equally affected by the economic crisis. Therefore, those explanatory factors at family level that could have been affected by the economic crisis would help us to achieve the objective of this study, i.e., to understand how different socio-economic characteristics have affected the enrolment in higher education in Spain during the period of economic crisis. Analysing the effect of these characteristics, we will be able to see whether this general upward trend can be generalized or is actually misleading and, therefore, the enrolment in higher education is actually decreasing among certain people according to their characteristics, leading to a greater social inequality.

According to data provided by the Survey of Living Conditions for Spain, the average income of Spanish households is on a downward trend since the beginning of the economic crisis. According to the data provided by this survey for 2011, the average income of Spanish households decreased by 5.5% since the start of the crisis. Moreover, according to the Household Budget Survey (HBS) for Spain, the spending capacity of Spanish households decreased in 11% between the beginning of the economic crisis in 2008 and 2011 (Salido, 2012). Therefore, we would expect that a decrease in family income during the economic crisis would lead to a lower enrolment in higher education. The logic behind this expectation is based on the Human Capital Theory, which helps to explain the enrolment in higher education, predicting the incentives and the reduction of costs derived from investing on education, including the opportunity cost (Petrongolo and San Segundo, 1999). One of the main theoretical basis of this approach is the fact that enrolment in higher education (non-obligatory education) responds to "the variations in direct and indirect school costs, as well as the variation in the additional income that the

additional years of schooling provide" (Greco 2004, p. 6). Therefore, the decision of investing in education is a rational choice that is based on taking under consideration the costs (direct and indirect) and the benefits that this action generates (Rincón Díez, 2014). From an individual perspective, the benefits of education can be monetary (higher wages) as well as non-monetary (for instance, a decrease in the risk of unemployment or better production capacity, among others) (Gil Izquierdo et al., 2010). In relation to costs, we distinguish between direct costs (tuition fees), indirect (transport, books, etc.) and opportunity costs (by choosing to study, the student forgoes the wages that he could earn working instead of studying) (Gil Izquierdo et al., 2010). Moreover, according to the Economic Theory, the higher the revenues, the lower the costs (direct, indirect and opportunity) of enrolment in the university (Pérez-Esparrells et al., 2013). Therefore, we expect that a worse economic situation and lower revenues would lead to higher costs (monetary as well as non-monetary), causing a decline in enrolment in higher education. Following this logic, the first hypothesis of this study could be summarized as follows:

Hypothesis 1: A less favourable economic situation in the family will lead to a lower enrolment of children in higher education compared to children from economically advantageous families

In addition to the above, some socio-economic characteristics of the family, personal characteristics (such as sex or ease of learning) or geographic location may also affect the decision to study (Pérez-Esparrells et al., 2013). For instance, it is observed that the higher the social scale, the greater the enrolment in higher education (Rodríguez, 1992; Peraita and Sánchez, 1998; cited by Pérez-Esparrells et al. 2013, p. 8). This could be explained by the Breen and Goldthorpe Model, which is based on the "relative risk aversion", i.e. the educational goal of young people is to achieve the same (or better) social class position as that of their family (Breen and Yaish, 2006). According to the methodological individualism defended by Boudon, Breen and Goldthorpe, the different educational level achieved by the different social classes is not due to different preferences, given that all social groups have the same, but their differences in material resources and their position in the social structure (Martínez García, 2008). The social classes have been affected differently by the economic crisis in Spain (Martínez García, 2014). Based on the Weberian Stratification (since it is based on occupation that allows us to capture the effects of the crisis in a better way), high service class (managers and professionals) are perceiving the crisis to a lesser extent, while low service class, the working class and other low-skilled occupations are experiencing a severe loss of purchasing power (Martínez García, 2014). Furthermore, the probability of being unemployed varies by social class, being the classes in a better situation before the economic crisis less affected (Martínez García, 2014). Therefore, the second hypothesis could be summarized as follows:

Hypothesis 2: A lower social class position of the family will lead to a lower enrolment of children in higher education compared to children from families with a better social class position

Related to social class, we find the occupation of the parents as an important factor to explain the enrolment in higher education. In general, the studies find a positive and significant effect of occupational level on enrolment in higher education (Pérez-Esparrells et al., 2013). It is expected a greater enrolment in higher education for those children whose parents are professionals or managers compared to those whose parents are unskilled workers (Gil Izquierdo et al., 2010; Pérez-Esparrells et al., 2013). The occupations have been also affected differently by the economic crisis through unemployment, being the workers (skilled and unskilled) and the

agricultural sector the most affected (Martínez García, 2014). From this derives the third hypothesis:

Hypothesis 3: A lower occupational level of parents will lead to a lower enrolment of children in higher education compared to children whose parents have a better occupational level

Among the contextual explanatory factors of enrolment in higher education that have been affected by the economic crisis, we can find the general and youth unemployment. The data collected for Spain by the Economically Active Population Survey (EAPS) between the second trimester of 2007 and the third trimester of 2008 shows that young population (from 16 to 24 years old) is more vulnerable to be unemployed (De la Rica, 2009). Basing on the opportunity cost, in this context would mean the cost of investing the time and resources in studying instead of working and the consequences that this entails, in periods of high unemployment rates (and especially among young people), people have a lower opportunity cost of accessing to higher education or continue studying instead of entering the labour market with very high unemployment (San Segundo, 2001; cited by Gil Izquierdo et al. 2010, p. 79). Therefore, it is expected that in those provinces where the unemployment rate is higher, the enrolment in higher education will be also higher. From this idea, the fourth hypothesis is derived:

Hypothesis 4: Families who live in Spanish provinces with a higher unemployment rate will have higher levels of enrolment in higher education than those children from families in provinces with lower levels of unemployment

In addition to this hypothesis, a fifth hypothesis based on the interaction between the economic situation at family level and the economic situation of the province, measured through the unemployment rate, will be tested:

Hypothesis 5: The effect of having a less favourable socio-economic situation on enrolment in higher education will be different for those families who live in a province with a higher unemployment rate compared to those families who live in provinces with lower levels of unemployment.

2.2. Conceptual Model

Figure 3. Conceptual model of enrolment in higher education: aggregate and family levels
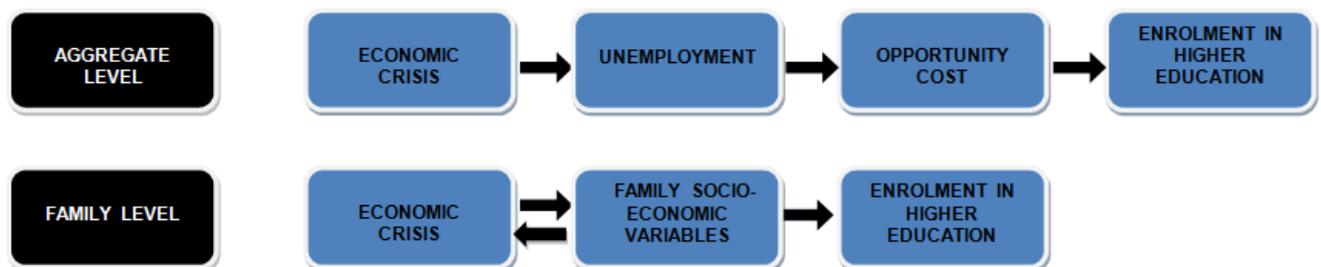
Source: Literature Review, Economic Theory, Human Capital Theory, Boudon's Model and Breen and Goldthorpe Model

As previously mentioned, enrolment in higher education in Spain is continuing an upward trend since the beginning of the economic crisis in 2008. However, this general upward trend should not be generalized to everybody since the economic crisis has not affected equally to the different socio-economic groups (De la Rica, 2009).

On one hand, at aggregate level, the economic crisis has impacted severely on unemployment in Spain, reaching an unemployment rate of 23.7% during the fourth trimester of 2014 according to the data of the NSI. The increase of the unemployment rate has affected the enrolment in higher education through the opportunity cost, meaning in this context the cost of investing the time and resources in studying instead of working and the consequences that this entails. Basing on the idea of the opportunity cost, people have a lower opportunity cost of accessing to higher education or continue studying instead of entering the labour market during a period of economic recession where the unemployment rate is very high and the chance of finding a job is very low (San Segundo, 2001; cited by Gil Izquierdo et al. 2010, p. 79). Moreover, having a higher educational level protects more individuals from job losses, even in periods of economic crisis, generating greater employment prospects (National Institute of Educational Evaluation, 2013), causing a lower opportunity cost and incentivizing the enrolment in higher education.

On the other hand, at family level, as previously mentioned, the economic crisis has affected certain socio-economic characteristics, which could influence negatively the enrolment in higher education in Spain. In addition, some socio-economic factors, such as highest parent's level of education or the occupation of the parents prior to the beginning of the crisis, may moderate the effect of the economic crisis. Economic situation at family level, social class and occupation of the parents are the family factors that are going to be used in this research to measure the impact of the economic crisis on the enrolment in higher education at family level. Moreover, the effect of the economic crisis at aggregate level will be captured through the unemployment at provincial level, comparing those parents who live in a province where the unemployment rate is high, medium or low. Furthermore, some control variables concerning the parents, such as gender, age, marital status or highest level of education, will be considered in the analysis.

Chapter 3

DATA AND METHOD

3.1. Data
3.1.1. Database: Barometer March 2012 by the CIS

The Centre for Sociological Research (CIS, *Centro de Investigaciones Sociológicas*) from Spain is an autonomous body that gathers information of Spanish citizens in order to develop scientific knowledge on Spanish society, usually through periodic surveys.

The Barometers that the CIS carries out are on a monthly basis and their main objective is to measure Spanish public opinion at that time on several and different topics. These polls are conducted with around 2500 randomly-chosen people from all over the country, which constitutes a cross-section of the population.

With the aim of answering the main research question of this study (How has the economic crisis, as indicated by the unemployment at the regional level, affected the enrolment in higher education in Spain?) and achieving the chief objective pursued (find out how the enrolment in higher education in Spain has been affected during the period of economic crisis at family level according to different socio-economic characteristics), the Barometer March 2012 by the CIS is going to be used to collect the necessary information during the period of the economic crisis.

The Barometer March 2012 collects data for Spanish people aged 18 and above in the period after the beginning of the economic crisis. The sample consists of 2474 people interviewed from March 2nd to March 11th 2012 in 240 different municipalities in 48 provinces. Data was collected by means of face-to-face interviews at the homes of people selected for the sample. The recruitment process for the sample was multistage, stratified cluster, with a proportional random selection of primary sampling units (municipalities) and secondary units (sections), and with a selection of the last units (individuals) based on quota sampling, using sex and age. The strata were formed through the crossing of the 17 Autonomous Communities (AACC) and the size of habitat occupancy, divided into seven categories: less or equal to 2000 inhabitants; from 2001 to 10000; from 10001 to 50000; from 50001 to 100000; from 100001 to 400000; from 400001 to 1000000; and more than 1000000 inhabitants.

3.1.2. Variables and Transformations
3.1.2.1. Dependent variable

As previously stated, the variables that are going to be used to carry out the research are chosen from the data pertaining to the Barometer March 2012 by the CIS. Since we want to know the differences between families who have a child enrolled in higher education versus those who are not, a dichotomous variable will be used as the dependent variable. Therefore, the dependent variable will be transformed into a dummy variable, which will take the value of (1) to indicate the presence of higher education and (0) to indicate the absence of higher education.

Nevertheless, despite the fact that there is not a minor percentage of grant holders, e.g. 35% for the 2010-2011 academic year (National Institute of Educational Evaluation, 2013), we know that the general reality in Spain is that parents finance their children's higher education. Therefore, the effect of the economic crisis on their parents is, in fact, the focus of the research considering

that, in the event that parents are experiencing economic difficulties, they are not going to be able to afford the costs of their children's higher education. For that reason, the dependent variable will be transformed into a dummy variable, which will consist of (1) parents with children studying in higher education and (0) parents with children not studying in higher education. Therefore, in order to conduct the empirical analysis, we need first to reduce the sample to our population at risk: those parents who have children aged 18 or more, who are able to enrol in higher education. According to data provided by EUROSTAT, since we know that the mean age of women at birth of first child in Spain was 30.3 years old in 2012, we will take into account the population in our sample aged 48 or more, which is obtained by the sum of 30 (mean age of women at birth of first child in 2012) plus 18 (age at which children are able to enrol in higher education). Even though we realize that the cohort of women under study might have had their children at slightly younger ages, this age range is sufficiently defined proxy to capture our study population. We are assuming that people aged 48 or more with children will have children aged 18 or more. Moreover, we need to set an age limit in order to avoid including parents who might have children too old to study in higher education. As a result, our sample will be reduced to our population at risk: those who are between 48 and 70 years old that are able to have children in higher education. However, it should be pointed out that we may lose data for some people that have already children aged 18 or more being younger than 48. In addition, we may include cases of people who have children who finished their higher education some years ago. Nevertheless, since we know that currently there are more cases of people enrolled in higher education who are older than 30 years old, e.g. in 2011 a total of 8114 aged between 30 and 34 years old and 4545 people aged 40 or more finished a recognized postgraduate programme according to NSI data, we are not going to reduce more our sample due to the importance of preserving these cases.

The sample size for the Barometer March 2012 is 782 respondents aged between 48 and 70 years old. As previously stated, our dependent variable will be based only on parents, so we will reduce our sample aged between 48 and 70 to those who are parents. There is a specific question regarding having children or not, and a sub-question regarding the level of education that their children are studying, including higher education. There are a total of 536 respondents aged between 48 and 70 years old who are parents, of which 106 have children in higher education and 430 have not children in higher education. As previously mentioned, we are losing data for some people that have already children aged 18 or more being younger than 48. However, basing on the results obtained by reducing our sample, the total number of parents with children studying in higher education is not severely reduced (from 176 if we keep the whole sample of 2474 respondents, to 106 if we reduce our sample to the population at risk of 536 respondents). Therefore, the dependent variable will be based on people who have children, distinguishing between parents who have children studying in higher education and parents who have children that are eligible but not studying in higher education. As a result, a new dummy variable will be created as our dependent variable for the period 2012, being our reference category (1) parents who have children aged 18 or more studying in higher education, in comparison with (0) parents who have children aged 18 or more not studying in higher education. Nevertheless, it should be pointed out that we are using the category of "does not apply" for the 0, given that those parents who have children that are not studying in any of the educational levels specified in the survey (Pre-school, Primary, Secondary, Baccalaureate, Vocational Training and Tertiary education) will answer "does not apply". Since we are reducing our sample in order to consider only those parents who have children aged 18 or more and considering that the education is compulsory between the ages of 3 and 16 years old in Spain, the chances of including children who are less

than 3 years old and so they are not studying in any of the educational levels and considered as "does not apply" is very low. It should be also pointed out that we have 246 missing cases, which belong to those parents who have children studying in another level of education who are not of interest to this research.

3.1.2.2. Control and Independent variables

Our sample, which consist of parents with children studying in higher education and parents with children who could have potentially got enrolled in higher education but did not, is reduced from 536 to 410 respondents. This is due to the fact that some provinces have been deleted because of collinearity or a low number of observations, being excluded from the analysis by the statistical analysis software. The main characteristics of our sample, such as gender, age, marital status and highest level of education, which will be used as control variables during the analysis, are summarized in Table 1:

Table 1. Characteristics of the sample: parents who have children studying in higher education in comparison with parents who have children not studying in higher education			
Characteristics of the parents	**Parents who have children studying in higher education**	**Parents who have children not studying in higher education**	**Total**
Gender	**Male**	51 (55.43%)	136 (42.77%)	187 (45.61%)
	Female	41 (44.57%)	182 (57.23%)	223 (54.39%)
Age	**48-53**	51 (55.43%)	29 (9.12%)	80 (19.51%)
	54-59	28 (30.43%)	84 (26.42%)	112 (27.32%)
	60-65	12 (13.04%)	114 (35.85%)	126 (30.73%)
	66-70	1 (1.09%)	91 (28.62%)	92 (22.44%)
Marital Status	**Single**	0	3 (0.94%)	3 (0.73%)
	Married	82 (89.13%)	257 (80.82%)	339 (82.68%)
	Divorced/Separated	7 (7.61%)	28 (8.81%)	35 (8.54%)
	Widowed	3 (3.26%)	30 (9.43%)	33 (8.05%)
Highest level of education[1]	**Primary education**	21 (22.83%)	161 (50.63%)	182 (44.39%)
	Secondary education	37	105	142

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[1] Shortened version of the classification of the Spanish system of education according to Ortiz (2008). Primary education is composed of the categories *Lower than 5 years of school attendance*, *Primary education of LOGSE* and *Middle grade training cycles*; secondary education is composed of *Compulsory Secondary education or High school*, *Baccalaureate LOGSE* and *Superior-level training cycles*; and tertiary education is composed of the categories *Architect or Engineering technician*, *Short degree course*, *Architect or Advanced engineer* and *Long degree course*.

		(40.22%)	(33.02%)	(34.63%)
	Tertiary education	32 (34.78%)	36 (11.32%)	68 (16.59%)
Total		92	318	**410**

The independent variables chosen from the Barometer March 2012 in order to test the different hypotheses presented previously and answer the main research question are:

- *Economic situation.* This variable has been obtained from the question 34 (*How would you describe your current economic situation?*) and will be used to test the first hypothesis. It was originally composed of seven categories: *Very good, Good, Neither good nor bad, Bad, Very bad, Do not know* and *Do not answer*. We have grouped together *Very good* and *Good*; and *Bad* and *Very bad*. Moreover, we have created two dummies (*Neither good nor bad* and *Bad/Very bad*), using the category *Very good/Good* as reference category. In addition, we have omitted the categories *Do not know* and *Do not answer*, given that only three respondents were included in these categories.
- *Social class.* This variable was originally composed of six categories: *Upper and upper-middle classes*, *New middle classes*, *Old middle classes*, *Skilled workers*, *Unskilled workers* and *No information*. Based on these categories, we have created three dummies: *Middle class* (which has been obtained by grouping the categories of *New middle classes* and *Old middle classes* together), *Lower middle class* (which refers to *Skilled workers*) and *Working class* (which refers to *Unskilled workers*). As in the previous case, we have omitted the category of *No information*, losing 29 respondents. Finally, we have used as reference category *Upper and upper-middle class*, with the aim of testing the second hypothesis.
- *Occupation of the parents.* This variable has been obtained from the question 37 (*What is your current situation/occupation?*) and will be used to test the third hypothesis. It was originally composed of nine categories: *Working*, *Retired or pensioner (who have worked before)*, *Pensioner (who have not worked before)*, *Unemployed (who have worked before)*, *Unemployed (who looks for his/her first job)*, *Student, Unpaid domestic work*, *Other situation* and *Do not answer*. Based on these categories, we have created three dummies: *Retired or pensioner* (which has been obtained by grouping the categories of *Retired or pensioner* and *Pensioner* together), *Unemployed* (which has been obtained by grouping both categories of *Unemployed*) and *Unpaid domestic work*. Furthermore, we have dropped the categories of *Student* (with only one observation), *Other situation* (with three respondents) and *Do not answer* (with only two respondents) and we will use the category of *Working* as reference category.
- *Province.* As previously mentioned, the sample of the Barometer March 2012 consists of respondents from 48 provinces of Spain, even though seventeen of them have been deleted, including Ávila, Balearic Islands, Burgos, Cuenca, Girona, Guipúzcoa, Las Palmas, Lleida, Lugo, León, Salamanca, St. Cruz, Seville, Toledo, Teruel, Valencia and Zamora. The provinces will be grouped into three different categories in order to test the fourth hypothesis, which will be explained in more detail below.

The reference categories have been chosen in the basis of having a greater probability of enrolment in higher education, i.e. those within the reference category are expected to have a

greater enrolment in higher education according to the literature. All these independent variables, and their respective transformations explained above, can be summarized in Table 2:

Table 2. Independent variables and their transformations

Variables	Original categories	Others/Missing/ DK/DA	Transformation	Number of dummy variables	Reference category
Economic situation (P34)	1=Very good 2=Good 3=Neither good nor bad 4=Bad 5=Very bad	8=DK (0 respondents) 9=DA (3 respondents)	1+2=Very good/Good 3=Neither good nor bad 4+5=Bad/Very bad	2: - Neither good nor bad -Bad/Very bad	Very good/Good
Social class	1=Upper and upper-middle classes 2=New middle classes 3=Old middle classes 4=Skilled workers 5=Unskilled workers	9=No info (29 respondents)	1=Upper and upper-middle class 2+3=Middle class 4=Lower-middle class 5=Working class	3: - Middle class -Lower middle class -Working class	Upper and upper-middle class
Occupation (P37)	1=Working 2=Retired or pensioner (who have worked before) 3=Pensioner (who have not worked before) 4=Unemployed (who have worked before) 5=Unemployed (who looks for his/her first job) 6=Student (1 observation, dropped) 7=Unpaid domestic work	8=Other situation (3 respondents) 9=DA (2 respondents)	1=Working 2+3=Retired or pensioner 4+5=Unemployed 7=Unpaid domestic work	3: -Retired or pensioner -Unemployed -Unpaid domestic work	Working

Analysing the correlations between the independent variables, we find that the correlations are 0.166 between *Economic situation* and *Occupation*; 0.133 between *Economic situation* and *Social Class*; and 0.134 between *Occupation* and *Social* Class. According to Evans (1996), these correlations are very weak; therefore, we can state that there is no problem of multicollinearity and proceed with the analysis of the data.

As previously mentioned, the effect of the economic crisis at aggregate level will be captured through the unemployment at provincial level, comparing those parents who live in a province where the unemployment rate is high, medium or low. In order to do so, we have grouped the variable *Province* into 3 categories according to the unemployment rate in each of the provinces. Based on the data provided by the Labour Force Survey from March 2012 of Spain, the provinces have been grouped into: *High rate of unemployment* (30% or more); *Medium rate of unemployment* (20-29%); and *Low rate of unemployment* (below 20%). However, as earlier

pointed out, a total of seventeen provinces have been omitted due to problems of collinearity or a low number of observations, including Ávila, Balearic Islands, Burgos, Cuenca, Girona, Guipúzcoa, Las Palmas, Lleida, Lugo, León, Salamanca, St. Cruz, Seville, Toledo, Teruel, Valencia and Zamora. This classification can be summarized in the Table 3:

Table 3. Categorization of the variable *Province* according to the provincial unemployment rate

High rate of unemployment: 30% or more	Medium rate of unemployment: 20-29%	Low rate of unemployment: below 20%
Cádiz (36.37%)	Alicante (29.94%)	Zaragoza (19.46%)
Ceuta (35.51%)	Albacete (29.19%)	Segovia (19.42%)
Almería (35.28%)	Castellón de la Plana (28.19%)	Guadalajara (19.24%)
Málaga (34.61%)	Murcia (26.96%)	Palencia (18.99%)
Huelva (34.49%)	Pontevedra (25.08%)	Valladolid (18.86%)
Córdoba (32.67%)	Melilla (24.91%)	Madrid (18.65%)
Badajoz (32.40%)	Tarragona (23.62%)	Cantabria (18.59%)
Jaén (31.98%)	Barcelona (21.61%)	A Coruña (17.50%)
Granada (31.51%)	Asturias (20.39%)	Navarra (16.34%)
Cáceres (31.40%)	Ourense (20.10%)	Huesca (15.32%)
Ciudad Real (30.47%)	La Rioja (20.06%)	Álava (14.99%)
		Vizcaya (14.77%)
		Soria (14.37%)

Table 4 summarizes the frequencies of the new dummies created in relation with the dependent variable:

Table 4. Frequencies of the independent variables in relation with the dependent variable

		Parents who have children studying in higher education	Parents who have children not studying in higher education	Total
Economic situation	**Very good/Good**	33 (35.87%)	69 (21.70%)	102 (24.88%)
	Neither good nor bad	47 (51.09%)	183 (57.55%)	230 (56.10%)
	Bad/Very bad	10 (10.87%)	65 (20.44%)	75 (18.29%)
Social Class	**Upper and upper-middle class**	23 (25%)	39 (12.26%)	62 (15.12%)
	Middle class	37 (40.22%)	108 (33.96%)	145 (35.37%)
	Lower middle class	25 (27.17%)	113 (35.53%)	138 (33.66%)
	Working class	6 (6.52%)	51 (16.04%)	57 (13.90%)

		52 (56.52%)	71 (22.33%)	123 (30%)
Occupation	**Working**	52 (56.52%)	71 (22.33%)	123 (30%)
	Retired or pensioner	11 (11.96%)	144 (45.28%)	155 (37.80%)
	Unemployed	21 (22.83%)	37 (11.64%)	58 (14.15%)
	Unpaid domestic work	8 (8.70%)	65 (20.44%)	73 (17.80%)
Provinces based on unemployment rate	**High rate**	22 (23.91%)	69 (21.70%)	91 (22.20%)
	Medium rate	36 (39.13%)	125 (39.31%)	161 (39.27%)
	Low rate	34 (36.96%)	124 (38.99%)	158 (38.54%)
Total		92	318	**410**

In addition to the above, two interactions between the variables *Province* and *Economic situation* will be created in order to test the fifth hypothesis. The *Medium rate of unemployment* will be the reference category in order to compare how living in a province with a higher or lower unemployment rate interacts with a *Bad/Very bad* economic situation at family level. These interactions will be:

- Economic situation (Bad/Very bad)*Province (Low rate of unemployment)
- Economic situation (Bad/Very bad)*Province (High rate of unemployment)

3.2. Methodology

Since we want to assess the probability of enrolling in higher education, and the extent to which such a probability is explained by socio-economic variables, the method chosen to carry out this research is a logistic regression. As the research requires a dichotomous variable that captures the likelihood of enrolling in higher education versus not, logistic regression is the suitable research method to use.

The logistic regression is an analytic technique that allows modelling a categorical dependent variable, measuring the relationship between the categorical dependent variable with one or more independent variables (DeMaris, 1995). The motivation to use the logistic regression model can be based on one of the two different ways: firstly, through the latent variable approach, especially based on the assumption of a logistic distribution of the errors; and secondly, through the use of a logistic function to retain the linear function within the values 0 and 1, in order to model a probability (DeMaris, 1995). Therefore, the objectives of using the logistic regression as the method to conduct the research are, on one hand, to know the probability of obtaining a particular value of the dependent variable associated with one of the independent variables and, on the other hand, to predict the probability of obtaining a particular value of the dependent variable given the one of the independent variable (McDonald, 2009).

As previously stated, we are interested in comparing parents with children studying at the university, on the one hand, with parents with children who could have potentially got enrolled in

the university but did not, on the other hand. As has been discussed in the section *Dependent variable*, we have information on those parents with children studying in higher education and those parents with children aged 18 or more who are not studying in higher education. Thus, the dependent variable will be transformed into a dummy variable, being our reference category (1) parents who have children aged 18 or more studying in higher education, in comparison with (0) parents who have children aged 18 or more not studying in higher education.

Regarding the independent variables, the performance of the logistic regression will allow us to see the effect of the different socio-economic variables on enrolment in higher education, always compared with our reference category, which have been already explained in the previous section.

However, we need to consider that we are using two different levels: individuals and provinces. Therefore, we need to understand that perhaps there are no equal opportunities to enrol in higher education in each of the provinces and so the observations are not fully independent of each other. In the case that we use only a standard regression, this would lead to assume that there is an independence of observations, which would yield smaller standard errors than they should be and, therefore, we would obtain statistically significant results that could be misleading (Anglim, 2010).

In conclusion, we need to introduce an adjustment standard error procedure in order to obtain more robust errors and control for the effect of provinces (Anglim, 2010). Moreover, we have included the dummies for the provinces, comparing them with the first province (Álava).

3.3.Ethical Issues

The use of secondary data, as the case of this research, is not exempt of ethical issues. For instance, during a secondary data analysis, people are not asked for their consent for manipulating their data. Despite the fact that they were already asked for their consent when the data were collected, we still need to maintain and guarantee their anonymity.

Nevertheless, one should clarify that the Centre for Sociological Research provides since the creation of the Database in 1963 free download of micro data files for the most of studies that they have conducted. Since January 2009, the CIS provides free access to its Database to all citizens who want to consult and analyse data for their own studies. The various surveys conducted by the CIS are available online, being able to look specifically for studies, questions and series and to access to micro data. Some data are freely accessible through the catalogue, and others can also be obtained for free from the Database using an application form where personal details and reasons and objectives of using the data are asked.

Chapter 4

RESULTS

As pointed out above, we are using the logistic regression to conduct the analysis of the data. Our dependent variable is a dummy variable composed of the reference category (1) parents who have children aged 18 or more studying in higher education, in comparison with (0) parents who have children aged 18 or more not studying in higher education. A total of four logistic regressions have been performed in order to see how the coefficients change when introducing more independent variables. Firstly, we will perform a simple model introducing our first four independent variables: *Economic situation*, *Social class*, *Occupation* and *Provincial unemployment rate*. Secondly, we will add the demographic characteristics to the model, such as *Gender*, *Age*, *Marital status* and *Highest level of education*. Thirdly, we will include both interactions. Fourthly, we will perform our final model, which will be composed of all independent variables and interactions introduced previously as well as the variable *Province* and an adjustment standard error procedure in order obtain more robust errors and control for the effect of provinces.

Table 5 shows the results of the performance of the logistic regressions. This table has been divided into two parts: the first part of the table presents the results for Models 1 and 2, whereas the second part shows the results for Models 3 and 4.

Focusing on the first part of the table, we can see the results obtained for Model 1, which includes the independent variables *Economic situation*, *Social class*, *Occupation* and *Provincial unemployment rate*, and for Model 2, which adds the demographic characteristics, such as *Gender*, *Age*, *Marital status* and *Highest level of education*. We can observe that Model 2 fits better the data than Model 1, since the Log likelihood increases from -177.03091 to -141.46086 and the pseudo R-squared increases from 18.90% to 35.20%. Regarding the coefficients obtained for the independent variables, we can see that the effects remain by and large the same, with a few exceptions. The results obtained in this first part can be summarized as follows:

- *Economic situation.* The effect of the dummies *Neither good nor bad* and *Bad/Very bad* on the dependent variable is statistically significant for both Models. On one side, the log odds of enrolment in higher education for someone whose parents have *Neither good nor bad* economic situation decrease by 0.527 in Model 1 and by 0.721 in Model 2 compared to someone whose parents have a *Very good/Good* economic situation, holding all other independent variables constant. Moreover, the effect of this dummy on the dependent variable is statistically significant at the 0.1 level for Model 1 and at the 0.05 level for Model 2. On the other side, the log odds of enrolment in higher education for those whose parents have a *Bad/Very bad* economic situation decrease by 1.344 in Model 1 and by 1.996 in Model 2 compared to someone whose parents have a *Very good/Good* economic situation, holding all other independent variables constant. Also, the effect of this dummy is statistically significant at the 0.01 level for both models.
- *Social Class.* Results vary based on the Model and the coefficients for Model 2 considerably increase compared to the coefficients for Model 1. The effect of *Working class* on the dependent variable appears as statistically significant at the 0.05 level for Model 1, but not for Model 2. The log odds of enrolment in higher education for someone whose parents belong to the *Working class* decrease by 1.297 compared to someone

whose parents belong to the *Upper and upper-middle class*, holding all other independent variables constant.

- *Occupation.* As in the previous case, results vary based on the Model. Whereas the effect of *Retired or pensioner* on the dependent variable is statistically significant at the 0.01 level for both Models, the effect of *Unpaid domestic work* appears as statistically significant at the 0.01 level for Model 1, but not for Model 2. On one side, the log odds of enrolment in higher education for someone whose parents are *Retired or pensioners* decrease by 2.311 in Model 1 and by 1.159 in Model 2 compared to someone whose parents are *Working*, holding all other independent variables constant. In addition, the odds of enrolment in higher education are 0.085 times lower for those whose parents are retired or pensioners compared to those whose parents are working. On the other side, the log odds of enrolment in higher education for someone whose parents are classified within the category of *Unpaid domestic work* decrease by 1.677 compared to someone whose parents are *Working*, holding all other independent variables constant. Finally, it is interesting to point out that the effect of being *Unemployed* on enrolment in higher education compared to be *Working* is not statistically significant, besides the fact that the coefficient is positive for both Models.

- *Provincial unemployment rate.* The effect of these dummies on the dependent variable is not statistically significant for both Models. However, it is interesting to see that whereas the effect of living in a province with a *High rate of unemployment* in comparison with living in a province with a *Medium rate of unemployment* on enrolment in higher education is positive, the effect of living in a province with a *Low rate of unemployment* in comparison with living in a province with a *Medium rate of unemployment* on enrolment in higher education is negative.

- *Demographic characteristics.* As previously stated, including the demographic characteristics in Model 2 considerably improves the model fit. Nevertheless, these variables are not of interest for the present research in explaining enrolment in higher education and are used as control variables based on the literature. It should be pointed out that the category of *Single* has been omitted from the analysis by the statistical software, as it has only 3 observations. On the other hand, the negative effect of the dummies for *Age* on the dependent variable appears as statistically significant at 0.01 level, what results very difficult to explain. A possible explanation for these results is that older age groups of parents no longer have children who could have potentially got enrolled, since those children may be too older to enrol in higher education and so the enrolment in higher education decreases.

In summary, Model 2 fits the data better than Model 1. The results obtained by the performance of both regressions do not differ very much. The main differences in the results are that the effect of the dummies *Working class* and *Unpaid domestic work* do not remain statistically significant in the second model and the coefficients for the dummies of *Social class* are much higher for the second model, leading a lower negative effects on the dependent variable.

Table 5. Logistic regression models for enrolment in higher education in Spain				
	Model 1		**Model 2**	
	B	**SE**	**B**	**SE**
Economic Situation				
Very good/Good				
Neither good nor bad	-0.527*	0.308	-0.721**	0.360
Bad/Very bad	-1.344***	0.466	-1.996***	0.573
Social Class				
Upper and upper-middle class				
Middle class	-0.456	0.360	-0.134	0.469
Lower middle class	-0.543	0.382	-0.160	0.508
Working class	-1.297**	0.552	-0.787	0.689
Occupation				
Working				
Retired or pensioner	-2.311***	0.377	-1.159***	0.460
Unemployed	0.042	0.359	0.032	0.418
Unpaid domestic work	-1.677***	0.430	-0.463	0.547
Provincial Unemployment Rate				
High rate of unemployment	0.229	0.350	0.233	0.409
Medium rate of unemployment				
Low rate of unemployment	-0.256	0.309	-0.261	0.356
Gender				
Male				
Female			0.432	0.341
Age				
48-53				
54-59			-1.800***	0.371
60-65			-2.773***	0.462
66-70			-4.406***	1.095
Marital Status				
Married				
Divorced/Separated			-0.346	0.581
Widowed			-0.791	0.765
Highest level of education				
Primary			-0.617	0.491
Secondary			-0.646	0.455
Tertiary				
Log likelihood	-177.03091		-141.46086	
Pseudo R^2	0.1890		0.3520	
Number of observations	410		410	
Controlling for provinces	No		No	

*p<0.1 **p<0.05 ***p<0.01

Focusing now on the second part of the table, we can see the results obtained for Model 3, which adds both interactions and all other independent and control variables included previously, and for Model 4, which is the final model. As previously stated, this final Model is composed of all independent variables and interactions introduced previously as well as the variable *Province* and an adjustment standard error procedure in order obtain more robust errors and control for the effect of provinces.

On one side, comparing Model 2 with Model 3, we can observe that Model 3 fits slightly better the data than Model 2, since the Log likelihood increases from -141.46086 to -141.41704 and the pseudo R-squared increases from 35.20% to 35.22%. Therefore, including the interactions slightly improve the model fit. Regarding the coefficients obtained for the independent variables, we can see that the effects remain by and large the same for both models, with only two important exceptions: on one hand, the effect of *Bad/Very bad* economic situation is no longer significant including the interactions in Model 3, even though the coefficient is similar and negative for both models; on the other hand, the effect of living in a province with a *Low rate of unemployment* in comparison with living in a province with a *Medium rate of unemployment* on enrolment in higher education is now positive, although the coefficient is very close to zero. In addition, the effect of the interactions on the dependent variable is not statistically significant. Whereas the coefficient obtained for the interaction between a *Bad/Very bad* economic situation and a *Low unemployment rate* at provincial level is negative; the coefficient obtained for the interactions between a *Bad/Very bad* economic situation and a *High unemployment rate* at provincial level is positive.

On the other side, comparing Model 3 with our final Model 4, we can observe that Model 4 fits considerably better the data than Model 3, since the Log likelihood increases from -141.41704 to -117.39921 and the pseudo R-squared increases from 35.22% to 46.22%. Therefore, including the variable *Province* and an adjustment standard error procedure improve the model fit. Regarding the coefficients obtained for the independent variables, we can see that the effects remain by and large the same for both models, with the following exceptions:

- *Economic situation.* The coefficients for these dummies are much lower now, leading to larger negative effects on the dependent variable. Whereas the effect of *Neither good nor bad* is statistically significant, the effect of *Bad/Very bad* is not. When we add the interactions to the model, the effect of *Bad/Very bad* on the dependent variable is no longer statistically significant. Algebraically, an interaction variable is the product of two variables, allowing the effect on the dependent variable of one of the independent variables to depend on the value of the other independent variable. However, despite the fact that the interactions have not a significant effect, they add explanatory power to the model (both Log likelihood and pseudo R-squared increase). In consequence, we will keep the interactions in the model.
- *Social Class.* The effect of *Working class* on the dependent variable appears again as statistically significant at the 0.05 level and with a much lower coefficient, leading to a larger negative effect on the enrolment in higher education.
- *Provincial unemployment rate.* The findings for this variable are the most interesting, since these dummies have now a statistically significant effect at the 0.01 level on the dependent variable and their coefficients are now negative. Whereas living in a province with a *High rate of unemployment* in comparison with living in a province with a *Medium*

rate of unemployment decreases the log odds of enrolment in higher education by 4.753, living in a province with a *Low rate of unemployment* in comparison with living in a province with a *Medium rate of unemployment* decreases the log odds of enrolment in higher education by 4.676, holding all other independent variables constant. Therefore, after controlling for individual-level variables, the effect of these dummies becomes statistically significant, what means that the local economic and labour environment affect the probability of enrolment in higher education, regardless of financial family circumstances.

- *Interactions.* The coefficient obtained for the interaction between a *Bad/Very bad* economic situation and a *High unemployment rate* at provincial level is now negative.

In summary, our final Model 4 fits the data better than the rest of Models. The results obtained by the performance of the final regression show statistically significant effects of the dummies *Neither good nor bad*, *Working class*, *Retired or pensioner*, *High rate of unemployment* and *Low rate of unemployment*, all of them with negative coefficients. Finally, looking at the effect of the different provinces, we see that for all provinces, the effect on the dependent variable is statistically significant, with the only exception of four provinces (Badajoz, Huesca, Soria and Valladolid)[2].

Table 5. Logistic regression models for enrolment in higher education in Spain (continuation)				
	Model 3		**Model 4 (final)**	
	B	**SE**	**B**	**Robust SE**
Economic Situation				
Very good/Good				
Neither good nor bad	-0.724**	0.361	-1.294***	0.430
Bad/Very bad	-1.870	1.539	-2.445	2.410
Social Class				
Upper and upper-middle class				
Middle class	-0.129	0.469	-0.234	0.652
Lower middle class	-0.150	0.508	-0.107	0.738
Working class	-0.786	0.689	-1.435**	0.743
Occupation				
Working				
Retired or pensioner	-1.168***	0.462	-1.283***	0.523
Unemployed	0.035	0.420	0.152	0.450
Unpaid domestic work	-0.466	0.547	-0.702	0.633
Provincial Unemployment Rate				
High rate of unemployment	0.119	0.910	-4.753***	1.676
Medium rate of unemployment				
Low rate of unemployment	0.003	1.242	-4.676***	1.747
Gender				

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[2] Consult Table 6 in *Appendix*

Male				
Female	0.440	0.344	0.417	0.493
Age				
48-53				
54-59	-1.813***	0.376	-2.370***	0.399
60-65	-2.782***	0.464	-3.834***	0.550
66-70	-4.417***	1.096	-6.236***	1.863
Marital Status				
Married				
Divorced/Separated	-0.368	0.586	-0.025	0.986
Widowed	-0.796	0.766	-1.202	0.931
Highest level of education				
Primary	-0.613	0.492	-0.446	0.536
Secondary	-0.645	0.455	-0.597	0.462
Tertiary				
Interactions				
Bad/Very bad*Low unemployment	-0.276	1.308	-0.233	2.125
Bad/Very bad*High unemployment	0.145	1.013	-0.284	1.158
Log likelihood / Log pseudo-likelihood	-141.41704		-117.39921	
Pseudo R^2	0.3522		0.4622	
Number of observations	410		410	
Controlling for provinces	No		**Yes***	

*p<0.1 **p<0.05 ***p<0.01
*Standard error adjusted for 34 clusters in "Province"

Regarding the different hypotheses formulated previously, based on the results obtained by the analysis of the data, we have come to the following conclusions:

- *Hypothesis 1: A less favourable economic situation in the family will lead to a lower enrolment of children in higher education compared to children from economically advantageous families.* Since the effect of having a *Neither good nor bad* compared to having a *Very good/good* economic situation on enrolment in higher education is statistically significant (p value lower than 0.01), and the coefficient is negative, we can partially confirm our first hypothesis. However, since the effect of having a *Bad/Very bad* economic situation compared to having a *Very good/good* economic situation is not statistically significant, we cannot entirely confirm this hypothesis.
- *Hypothesis 2: A lower social class position of the family will lead to a lower enrolment of children in higher education compared to children from families with a better social class position.* This hypothesis is only confirmed for those children whose parents are categorized into *Working class*. The effect of belonging to the *Working class* compared to belonging to the *Upper and upper-middle class* on enrolment in higher education is statistically significant (p value lower than 0.05) and with a negative coefficient.

Consequently, we can affirm that those children whose parents belong to the *Working class* compared to those whose parents belong to the *Upper and upper-middle class* have a significantly lower enrolment in higher education in Spain.

- *Hypothesis 3: A lower occupational level of parents will lead to a lower enrolment of children in higher education compared to children whose parents have a better occupational level.* This hypothesis is only confirmed for those children whose parents are *Retired or pensioner*, given that this dummy has a statistically significant effect on the dependent variable (p value lower than 0.01). Therefore, we can affirm that those children whose parents are *Retired or pensioner* compared to those children whose parents are *Working* have a significantly lower enrolment in higher education in Spain. On the contrary, being unemployed seems not having a significant effect on enrolment in higher education and shows a positive coefficient.

- *Hypothesis 4: Families who live in Spanish provinces with a higher unemployment rate will have higher levels of enrolment in higher education than those children from families in provinces with lower levels of unemployment.* As previously stated, the effect of these dummies on our dependent variable is surprisingly contrary to the expected. The results show that living in a province with a high rate of unemployment compared to living in a province with a medium rate of unemployment significantly decreases the enrolment in higher education (p value lower than 0.01). However, living in a province with a low rate of unemployment compared to living in a province with a medium rate of unemployment significantly decreases the enrolment in higher education as well (p value lower than 0.01). Therefore, despite the fact that the effect of these dummies on our dependent variable is statistically significant, our hypothesis is wrong by stating the opposite outcome.

- *Hypothesis 5: The effect of having a less favourable socio-economic situation on enrolment in higher education will be different for those families who live in a province with a higher unemployment rate compared to those families who live in provinces with lower levels of unemployment.* The interactions made do not have a statistically significant effect on the dependent variable. This suggests that we have not enough evidence to reject the null hypothesis (p value higher than 0.1). However, as previously mentioned, it is interesting to see that the coefficients for both interactions are negative.

Chapter 5

CONCLUSIONS AND DISCUSSION

The enrolment in higher education in Spain has followed an upward trend since the outbreak of the Great Recession in 2008. However, this trend cannot be generalized to all sections of the Spanish population. Since different social groups have experienced the crisis differently (De la Rica, 2009), the objective of this research was to find out how different socio-economic characteristics have affected the enrolment in higher education in Spain during the period of economic crisis. This objective was redefined into a broad main question (How has the economic crisis, as indicated by the unemployment at the regional level, affected the enrolment in higher education in Spain?) and other associated sub-questions, which have been answered throughout this research.

According to the results obtained by the analysis of the data from the Barometer March 2012 by the CIS, there is a higher inequality in enrolment in higher education for families with certain socio-economic characteristics. Out first, second and third hypotheses have been partially confirmed, since only some categories have a significant effect on enrolment in higher education. Firstly, those children whose parents have a *Neither good nor bad* compared to those whose parents have a *Very good/good* economic situation show a significantly lower enrolment in higher education. Secondly, those children whose parents belong to the *Working class* compared to those whose parents belong to the *Upper and upper-middle class* have a significantly lower enrolment in higher education. Thirdly, those children whose parents are *Retired or pensioner* compared to those children whose parents are *Working* have a significantly lower enrolment in higher education. Therefore, the upward trend at national level is actually misleading for children whose parents are included in one of these categories, which leads higher inequality in enrolment in higher education.

On the other side, the effect of a high unemployment rate on enrolment in higher education has been surprisingly contrary to the expected. The literature is not consistent regarding the effect of unemployment on higher education. On one side, theoretically it would be expected that a higher rate of unemployment had a negative effect on enrolment in higher education due to, on one hand, a worse economic situation which made less profitable the investment in higher education and, on the other hand, the unemployment situation among families which led to a budgetary constraint (Petrongolo and San Segundo, 1999; Petrongolo and San Segundo, 2002; cited by Pérez-Esparrells et al. 2013, p. 10). On the other side, a higher rate of unemployment could also have a positive effect on enrolment in higher education on the basis of the opportunity cost, since finding a job would be more difficult and the opportunity cost of enrolment in higher education or the continuation of higher studies would be lower (De la Rica and San Martin, 1999; cited by Pérez-Esparrells et al. 2013, p. 10). The results obtained by our analysis corroborate the first idea: living in a province with a high rate of unemployment compared to living in a province with a medium rate of unemployment significantly decreases the enrolment in higher education (p value lower than 0.01). Likewise, the results obtained for living in a province with a low unemployment rate compared to living in a province with a medium rate of unemployment show a significant decline in enrolment in higher education (p value lower than 0.01). Following the Human Capital theory, families living in a province with a low unemployment rate are expected to have a greater enrolment in higher education since they may have a better economic situation

which makes more profitable the investment in higher education. However, the results obtained have been also contrary to the expected. This finding could be explained following the idea of the opportunity cost: since the unemployment rate is low and finding a job is easier, the opportunity cost of enrolment in higher education is higher due to the loss of wages that could be perceived working instead of studying. Therefore, according to the results obtained by our analysis, a high as well as a low provincial unemployment rate entail a significant decline in enrolment in higher education compared to a medium provincial unemployment rate.

Although these results are compelling, there are some limitations to this study. The main limitation is that all these findings are specific for Spain. We cannot generalize these results to the rest of European countries since the reality in Spain differs from the rest of European countries, due mainly to the very high unemployment rate, and the data used to conduct this research was specific to Spanish nationals. Another limitation has been the data used to conduct this research, given that the dataset does not include variables that would be of interest to this study, such as having siblings.

In conclusion, despite the fact that the enrolment in higher education in Spain has followed an upward trend since the outbreak of the Great Recession in 2008, the reality at the family level is different. For families with certain socio-economic characteristics, this upward trend is actually misleading. The State's current education policy and strategy should promote further equality in enrolment in higher education. As we have seen, families with certain socio-economic characteristics have a lower enrolment in higher education, entailing greater social inequality. Measures for greater equality in access to higher education, improvements in scholarships and grants, and improvements in employment prospects should be included in the educational policy. In addition, further investigations focusing on, for instance, the effect of the provincial youth unemployment, the scholarships and reduction funds in education or the effect of being a single mother or father would help us to understand how the economic crisis has affected the enrolment in higher education in Spain.

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Appendix

Table 6. Final logistic regression model for enrolment in higher education in Spain including the dummies for "Province"		
	B	**Robust SE**
Economic Situation		
Very good/Good		
Neither good nor bad	-1.294***	0.430
Bad/Very bad	-2.445	2.410
Social Class		
Upper and upper-middle class		
Middle class	-0.234	0.652
Lower middle class	-0.107	0.738
Working class	-1.435**	0.743
Occupation		
Working		
Retired or pensioner	-1.283***	0.523
Unemployed	0.152	0.450
Unpaid domestic work	-0.702	0.633
Provincial Unemployment Rate		
High rate of unemployment	-4.753***	1.676
Medium rate of unemployment		
Low rate of unemployment	-4.676***	1.747
Gender		
Male		
Female	0.417	0.493
Age		
48-53		
54-59	-2.370***	0.399
60-65	-3.834***	0.550
66-70	-6.236***	1.863
Marital Status		
Married		
Divorced/Separated	-0.025	0.986
Widowed	-1.202	0.931
Highest level of education		
Primary	-0.446	0.536
Secondary	-0.597	0.462
Tertiary		
Interactions		
Bad/Very bad*Low unemployment	-0.233	2.125

Bad/Very bad*High unemployment	-0.284	1.158
Provinces		
Álava		
Albacete	8.404***	1.523
Alicante	8.288***	1.446
Almería	2.969***	0.523
Badajoz	0.370	0.636
Barcelona	7.131***	1.430
Cáceres	3.012***	0.475
Cádiz	3.872***	0.751
Castellón	7.657***	1.361
Ciudad Real	1.630**	0.864
Córdoba	-2.180**	0.981
A Coruña	3.105***	0.881
Granada	2.137***	0.481
Guadalajara	4.173***	1.531
Huelva	4.195***	0.560
Huesca	1.406	1.122
Jaén	2.818***	0.502
León	7.114***	1.233
La Rioja	8.104***	1.489
Madrid	2.924***	0.912
Málaga	3.425***	0.681
Murcia	8.386***	1.456
Navarra	2.358***	0.829
Ourense	5.659***	1.472
Asturias	9.501***	1.485
Pontevedra	6.179***	1.409
Cantabria	3.030***	1.049
Soria	1.382	0.907
Tarragona	8.692***	1.419
Valladolid	-0.010	1.137
Vizcaya	3.478***	0.976
Zaragoza	4.910***	0.951
Log likelihood / Log pseudolikelihood	-117.39921	
Pseudo R²	0.4622	
Number of observations	410	
Controlling for provinces	**Yes***	

*p<0.1 **p<0.05 ***p<0.01
*Standard error adjusted for 34 clusters in "Province"