Essays on Parental Labor Market Characteristics and the Academic Outcomes of their Offspring

Jenifer Ruiz-Valenzuela

Thesis submitted for assessment with a view to obtaining the degree of Doctor of Economics of the European University Institute

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European University Institute
Department of Economics

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Abstract

This thesis examines the impact of parental job loss and parental job insecurity on several academic outcomes of their offspring.

Recent evidence has shown that parental job loss negatively influences the school performance of their offspring. Chapter 2 uses an original dataset I collected myself (described in Chapter 1) to study the effect of parental job loss on children's school performance during the Great Recession in Spain. Conditioning on student fixed effects and observed covariates, the Great Recession generates variation in job loss that could be considered analogous to that provided by randomisation. The results show that after father's job loss, students experience a negative and significant decrease on average grades of about 13 to 19% of a standard deviation. This effect remains unaltered once the impact of mother's job loss on grades is accounted for. Interestingly, maternal job loss has no significant effect on the school performance of her offspring. Moreover, school performance prior to father's job loss is not affected by future job losses, reinforcing the causal interpretation of the link between father's job loss and children's educational outcomes. Finally, the impact of paternal job loss is not homogeneous across students, but it is rather largely concentrated among children whose fathers suffer long unemployment spells after job loss and those students in already disadvantaged families in terms of the level of education of the father. Therefore, these results are pointing out a mechanism (paternal job loss) through which further inequalities might develop during and after a deep economic crisis.

Chapter 3 uses exogenous variation in regional labour market policies in Spain to identify the impact of paternal job insecurity on the students' probability of graduating from compulsory education on time. Using data from the Spanish Labour Force Survey, average marginal effects and local average treatment effects (LATE) are estimated. Results indicate that students whose fathers hold a permanent contract (as opposed to a temporary, fixed-term contract) the year they should graduate from compulsory education are, on average, 7 percentage points more likely to graduate on time. LATE estimates are considerably higher, suggesting that those students whose fathers obtained a permanent contract as a result of the availability of regional subsidies reaped bigger benefits from paternal job stability. These results hold when maternal job insecurity is also accounted for, and they are concentrated on male students. Importantly, these findings seem to indicate that the pervasive effects of temporary contracts found elsewhere in the literature go beyond the employees and affect negatively their children's educational outcomes.

A mis padres/Als meus pares

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Preface

Starting in the 1960s, the study of human capital formation has been centre stage of the economic debate for a wide variety of reasons. One of the most notorious ones can be found in the seminal paper by Schultz (1961) on investment in human capital: "It has been widely observed that increases in national output have been large compared with the increases of land, man-hours, and physical reproducible capital. Investment in human capital is probably the major explanation for this difference." Besides its macroeconomic relevance, human capital formation has been the object of many studies at the microeconomic level. In one of the most influential works on the subject, Becker's *Human Capital*, we find a powerful hint describing why that could be the case: "Probably the most impressive piece of evidence is that more highly educated and skilled persons almost always tend to earn more than others." (Becker (2009) - Introduction to the first edition).

Individuals with higher human capital have in general better earning and employment prospects. Or as Schultz (1961) put it, by investing in themselves, people can enlarge the range of choice available to them: it is one way free men can enhance their welfare. As a result, a lot of effort has been devoted to understanding the determinants of human capital levels across the population, and even if investments in human capital are multidimensional, the study of the education dimension of human capital has had a predominant relevance.

Several studies have documented the effect of parental background and school inputs on cognitive achievement, school performance and, more generally, educational attainment. This thesis examines the impact of parental job loss and parental job insecurity (measured by the type of contract held by parents) on several academic outcomes of their offspring.

Recent evidence has shown that parental job loss negatively influences the school performance of their offspring. The developments taking place in the Spanish labour market since the onset of the Great Recession provide a good scenario to further explore the impact of parental job loss on children's educational outcomes. Since no data was available to fulfill this purpose, I designed a survey to collect panel data retrospectively on school performance and parental employment history in a school in the province of Barcelona. Chapter 1 describes the main features of the survey, the data collection process and the characteristics of the sample. In particular, Chapter 1 assesses the degree of the sample representativeness using different population concepts: the school population, the population of Catalan schools, and the Spanish population as given by the data in the Spanish Labour Force Survey. Finally, it also compares the labour market impact of the Great Recession on the Spanish population and on the sample.

Chapter 2 uses the data described in Chapter 1 to study the effect of parental job loss on

children's school performance during the Great Recession in Spain. Conditioning on student fixed effects and observed covariates, the Great Recession generates variation in job loss that could be considered analogous to that provided by randomisation. The results show that after father's job loss, students experience a negative and significant decrease on average grades of about 13 to 19% of a standard deviation. This effect remains unaltered once the impact of mother's job loss on grades is accounted for. Interestingly, maternal job loss has no significant effect on the school performance of her offspring. Moreover, school performance prior to father's job loss is not affected by future job losses, reinforcing the causal interpretation of the link between father's job loss and children's educational outcomes. Finally, the impact of paternal job loss is not homogeneous across students, but it is rather largely concentrated among children whose fathers suffer long unemployment spells after job loss and those students in already disadvantaged families in terms of the level of education of the father. Therefore, these results are pointing out a mechanism (paternal job loss) through which further inequalities might develop during and after a deep economic crisis.

Chapter 3 uses exogenous variation in regional labour market policies in Spain to identify the impact of paternal job insecurity on the students' probability of graduating from compulsory education on time. Using data from the Spanish Labour Force Survey, average marginal effects and local average treatment effects (LATE) are estimated. Results indicate that students whose fathers hold a permanent contract (as opposed to a temporary, fixed-term contract) the year they should graduate from compulsory education are, on average, 7 percentage points more likely to graduate on time. LATE estimates are considerably higher, suggesting that those students whose fathers obtained a permanent contract as a result of the availability of regional subsidies, reaped bigger benefits from paternal job stability. These results hold when maternal job insecurity is also accounted for, and they are concentrated on male students. Importantly, these findings seem to indicate that the pervasive effects of temporary contracts found elsewhere in the literature go beyond the employees and affect negatively their children's educational outcomes.

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Chapter 1

Job Loss at Home: Children's Grades during the Great Recession in Spain. Methods

1.1 Introduction

Starting in the 1960s, the study of human capital formation has been centre stage of the economic debate for a wide variety of reasons. One of the most notorious ones can be found in the seminal paper by Schultz (1961) on investment in human capital: "It has been widely observed that increases in national output have been large compared with the increases of land, man-hours, and physical reproducible capital. Investment in human capital is probably the major explanation for this difference." Besides its macroeconomic relevance, human capital formation has been the object of many studies at the microeconomic level.[1] In one of the most influential works on the subject, Becker's *Human Capital*, we find a powerful hint describing why that could be the case. "Probably the most impressive piece of evidence is that more highly educated and skilled persons almost always tend to earn more than others." (Becker (2009) - Introduction to the first edition).

Individuals with higher human capital have in general better earning and employment prospects. Or as Schultz (1961) put it, by investing in themselves, people can enlarge the range of choice available to them: it is one way free men can enhance their welfare. As a result, a lot of effort has been devoted to understanding the determinants of human capital levels across the population, and even if investments in human capital are multidimensional, the study of the education dimension of human capital has had a predominant relevance.[2]

Several studies have documented the effect of parental background and school inputs on cognitive achievement, school performance and, more generally, educational attainment.[3] Parental job insecurity, and more specifically, parental job loss, is one among these parental background variables that recently has been shown to affect the educational outcomes of their offspring. Rege et al. (2011) and Stevens and Schaller (2011) are among the most remarkable examples in the literature.

[1] See Barro (2001) or Doménech and De la Fuente (2006) for more recent evidence on the macroeconomic relevance of human capital.

[2] The different dimensions of investments in human capital include health, on-the-job training, formal education, migration, etc.

[3] Todd and Wolpin (2003) provide a review of the determinants of the production function for cognitive achievement. Ermisch and Francesconi (2001) and Woessmann (2004) are some of the many papers relating family background and educational attainment. Björklund and Salvanes (2011) provide a revision of this literature. Finally, see Hanushek (2006) for a review on the impact of school resources on various educational outcomes.

The developments taking place in the Spanish labour market since the onset of the Great Recession provide a good scenario to further explore the impact of parental job loss on children's school performance. Without a source of exogenous variation for parental job loss, the identification of its causal impact becomes extremely difficult. Experiments in this field are nearly impossible and would be extremely unethical. The Great Recession in Spain, however, provides a source of variation in job loss that, conditional on worker fixed effects and additional observed data, could be considered analogous to that given by randomization. With this strategy in mind, I designed a survey to collect panel data retrospectively on school performance and parental employment history, in a school in the province of Barcelona. Some of the existing studies on the subject had used job losses due to plant closures as a way to overcome endogeneity issues, but they either relied on cross section data (Rege et al., 2011), or on a very aggregate educational outcome measure like grade repetition (Stevens and Schaller, 2011).[4]

At the Spanish level, the already existing datasets do not offer the necessary information to tackle the question. The PISA (Programme for International Student Assessment) dataset contains data on the test performance (mathematics, reading, science, etc.) of 15 years olds, but the labour characteristics of the parents are scarce and collected only at one point in time. The same happens with the data collected by the Spanish Ministry of Education, the so called "Evaluación General de Diagnóstico", that tests the knowledge in different subjects of 4th graders in primary school and 2nd graders in secondary school. On the other hand, the databases that have a panel dimension, like the different household panels or the Labour Force Survey, have the advantage of observing the labour characteristics of the father for several quarters (or years in some cases). However, information on their offspring's educational outcomes is very limited. In the majority of cases, there is only information about the education level reached at a certain age for individuals over 16 years of age.

The purpose of this chapter is to describe the main features of the making of the survey, the data collection process and the characteristics of the sample. The rest of the chapter is structured as follows. Section 1.2 describes the questionnaire design and Section 1.3 presents the stages of the field work and the data collection process. Section 1.4 assesses the degree of the sample representativeness using different population concepts: the school population, the population of Catalan schools, and the Spanish population as given by the data in the Spanish Labour Force Survey. It also compares the labour market impact of the Great Recession on the Spanish population and on the sample. Lastly, Section 1.5 presents some final remarks.

[4]Other studies that have addressed a similar question are Kalil and Ziol-Guest (2008), Coelli (2011), Ananat et al. (2011) and Gregg et al. (2012).

1.2 Collecting parental employment history data retrospectively: The questionnaire design

Parental employment history data, together with personal and household characteristics, has been collected through a questionnaire whose final design has been done in collaboration with the school's Principals and Parents Association, and is the result of different trials. The first trial questionnaire was designed to collect the entire employment history of the parents retrospectively. This idea was inspired by questionnaires used in developing countries in order to reconstruct personal employment histories.[5] This first type of questionnaire was tried on a sample of school parents with a low and intermediate level of education reached. The main problem with this type of design was that it was very complicated for the respondent, without the help of an interviewer, to correctly answer the questionnaire. But due to time and resource constraints, the data collection could not be done by using any of the following options: (1) Personal interviews by employing interviewers, and (2) Computer assisted self interviews (given that a big percentage of parents in the school never use the computer).

Given the above constraints the questionnaire was simplified. A new version included questions about the employment situation and job characteristics of the parents only for three points in time: at the beginning of the crisis, in January 2008; in January 2010, and in January/February 2012 (this last point in time coincides with the period that the data was collected). These points in time were chosen for two reasons. First, fixing the time at the beginning of the year was thought to be helpful for parents to remember their employment situation at that particular point in time. Second, according to the data provided by the Spanish National Institute of Statistics (INE), the unemployment rate in Spain (and Catalonia) by the end of 2007 was the lowest since 1979, both for males and females. Accordingly, I was expecting to observe the majority of parents of the children enrolled at the school in the academic year 2011-2012 to be employed in January 2008, and a considerable amount of involuntary job changes taking place as the crisis deepened. Different versions of this shortened questionnaire were tried on the previous small sample of school parents, and a final trial was done with a new sample of parents that were not familiar with the questionnaire or its content. This final trial involved twelve new families, and eight of them answered back. Thanks to their answers I obtained personal feedback to minimise the level of complexity and time needed to fill the questionnaire.

The final questionnaire given to the families is divided in three parts: the household questionnaire (to be answered by either the father or the mother) and two individual questionnaires.

[5]There are examples of such questionnaires in countries like Burkina Faso -Migration Dynamics, Urban Integration and Environment Survey of Burkina Faso' (EMIUB)- or Uruguay -Primer conteo y censo de personas en situación de calle y refugios en Montevideo, Ministerio de Desarrollo Social (MIDES)-.

Both the household and the individual questionnaires contain a small section with brief instructions.[6] The household questionnaire is divided in three main sections. The first section contains questions about those children in the household that, at the moment of the interview, were enrolled at the school where the survey was taking place. The second section collects information on the children that were living in the household, but were not enrolled at the school when the survey was administered. Finally, the third section poses questions related to housing. One of the more delicate issues about the questionnaire was that it could not be confidential. The name of the student was asked at the beginning of the household questionnaire in order to be able to match the household and parental information with the academic outcomes of the student. Since this fact would most likely raise concern among parents, special emphasis was put on guaranteeing the confidentiality of their data.

The individual questionnaires were aimed to be answered by each parent (or step parent) as long as they were living in the same household as the children when the survey took place. The first section of the questionnaire asks personal data like birth date, nationality, and level of studies. The second section contains questions on the type of contract of the partner for the three points in time mentioned above. Notice that this information is asked twice. First, in the section just mentioned (questions 14 to 16). Second, as part of the questions concerning the employment situation of the respondents in the individual questionnaire (questions 21, 30 and 46, respectively). This information is asked twice in order to reduce the potential amount of missing data regarding a variable containing crucial information for this project: the labour status of the respondents. Finally, the main part of the individual questionnaire focuses on the employment history of the respondents. The design is such that if the individual had not changed her employment situation since January 2008, then there was no need for her to respond the questions referring to 2010 and 2008. But if the individual had experienced changes since 2010 (or 2008), then she was asked to keep on answering the questions concerning her employment situation in 2010 (and/or 2008). If the respondent had lost her job, she was asked about the reasons why this happened. This question is important since it allows separating voluntary from involuntary employment changes.

1.3 Field work and data collection process

This section describes the stages of the field work and the mechanisms used to incentivise parents to answer the questionnaire. It also summarises survey and item non response. Finally, it provides information on the type of school outcomes available for the children of responding parents.

[6] A copy of the original questionnaire, in Spanish, can be found at the end of this chapter. A translation of the questions into English can be found in Section 1.6.1 in the Appendix.

1.3.1 Stages of the questionnaire design

The structure and content of the questionnaires was designed between the months of October 2011 and January 2012. The final trial questionnaire was administered in mid January 2012. Before that, a meeting was held with the principal of the school, the vice-principal, the coordinator of the kindergarten grades and the president and vice-president of the Parents Association (AMPA). The goal of this meeting was to inform AMPA representatives about the existence and overall importance of the research project and have their support. Also, we asked them to participate in a trial questionnaire to validate the design of the final questionnaire. Following this meeting, the president of the AMPA handed in 12 complete sets of questionnaires to other AMPA representatives. A meeting was held a week later with the AMPA representatives participating in the trial, in order to have their impressions on the content and clarity of the questionnaire. As a result, a few changes were introduced to modify some questions that were perceived to be unclear. The final questionnaire was administered in mid-February 2012.

1.3.2 Mechanisms to reduce survey non-response

The process and the specific dates for the data collection were decided in agreement with the school. Below there is a list of the elements used to reduce survey non-response.

- Meetings with the students and parents: The vice-principal and myself met the students enrolled on compulsory secondary education and high-school grades in order to briefly explain the students the existence of the research project. Given the age of these students (12 to 18), these brief meetings were also aimed at motivating them to deliver the questionnaire at home and convince their parents to participate. For students in primary grades, the vice-principal and myself held meetings with the parents instead, in order to inform them personally about the questionnaires that they were soon going to receive and encourage their participation.

- The motivation letter: Together with the set of questionnaires, we attached a letter that kindly asked for the collaboration of the families in the research project. The letter was written in collaboration with the school, and signed exclusively by them. Even though it was the school asking for the collaboration of the parents, it was explained that only the researcher in charge of the project would have access to the micro data and that the principal and teachers would only have access to the conclusions of the research project. The letter also indicated how to return the questionnaires and the deadline to do so.

- The SMS to the parents: Since the number of students at the school outnumbered by more than 200 the number of families, it was decided to give the envelope containing the questionnaires only to the younger sibling at the school (since this is the system the school

normally uses). Unlike most survey research, the questionnaire was not delivered directly to the respondents, but to their children. Naturally, this particularity carried the additional problem that surveys may not actually reach the respondent. In order to minimise this possibility, the school administration sent a text message (SMS) to each family on the day the children received the questionnaires. In particular, either the father or the mother of all the children at the school received a text informing them that they were going to receive a questionnaire at home and that the school would very much appreciate if they could answer and return it to the reception of the school. An extra SMS was sent to each family before the deadline in order to remind them that they could still participate. A considerable number of questionnaires were received a few days after the theoretical deadline, since teachers were still encouraging children to motivate their parents to participate.

- The website: Finally, a website was created as a tool to give additional information on the research project and solve possible doubts about the questionnaires. In particular, the website contained summary information on the project, a section on potential frequent asked questions on the questionnaires and another section with examples on how to answer them. Parents were informed about the site on the presentation letter received together with the questionnaires. Also, they could find the address at the bottom of every page of the questionnaire (omitted on the questionnaires reproduced here to guarantee confidentiality of the school), and explicit mention about its availability was made during the meetings held with both secondary and high school students, and parents with children on primary school grades.

Finally, among the mechanisms that could not be used to increase the response rate was the idea of offering an economic incentive. This type of material incentives to the families were rejected by the school principals.

1.3.3 Survey and item non-response

A total of 313 families handed over the questionnaires. Since there could be more than one child enrolled at the school for each family, this data corresponded to 436 children distributed throughout all the grades. There were 931 children in 700 families enrolled at the school for the academic year 2011-2012. Some children were not present at the school the day the questionnaires were delivered, so we were able to hand over questionnaires to children in 630 families. The response rate is, therefore, close to 50% of the questionnaires delivered. After receiving, coding and revising the questionnaires, three typologies of answers emerged. First, a total of 242 families returned the questionnaires completed (some might have had some minor cases of item

non response, but in general the answers were complete and consistent). Second, some kind of inconsistency was found for the answers of either the father or the mother in 58 families.[7] In order to correct these inconsistencies, the school allowed me to contact these 58 families again. 21 of those families handed over the questionnaire corrected. Finally, out of the 313 returned questionnaires, 13 of them presented a substantial number of questions unanswered. These 13 families have been disregarded from the analysis. Additionally, 8 families did not provide the name of the child in the returned questionnaires, and therefore it was impossible to match the parental data provided with their offspring's grades. Taking this into account, the final sample consists of 408 students in 292 families.

Tables A1, A2 and A3 in Section 1.6.2 in the Appendix show the percent of missing data for each of the questions in the household and individual questionnaires. Item non-response is very low for almost all questions in the household and individual questionnaires. Importantly, there is almost no missing data regarding the labour status of the father or the mother, after following up with respondents to correct mistakes and manually review by using extra information in the questionnaires. In every individual questionnaire, the father (mother) is asked to report the type of contract of the partner. Thus, if the mother (father) did not answer what type of contract she (he) has, I can use the answer given by the partner in questions F14, F15 and F16 (M14, M15 and M16). Questions related to net income and those pertaining to year 2008 are the ones with a higher percent of missing data for both fathers and mothers. In the majority of these cases, 2008 data is missing because the respondent skipped that section by mistake. Missing values on net labour income can also be reduced by making use of extra information in the questionnaire. For instance, for the unemployed, I can use the information related to previous labour income and time in unemployment to reduce slightly the percent of missing data. Table A4 shows the final missing values on income related variables after using extra information in the questionnaire. Other than performing the usual follow up with respondents and manual review of answers, missing data has not been imputed and will be dealt with when faced with the different research questions that I pretend to answer with this dataset, if necessary.

[7] I detected two types of inconsistencies, associated with answering wrongly control questions. Control questions are those in which the next question to be answered depends on the answer given by the respondent to that particular question. In other words, depending on the answer to control questions respondents could skip a part of the questionnaire. There are two types of control questions in the questionnaire. First, if the answer to questions 20, 37, and 55 was negative, then the respondent could go directly to questions 33, 51 or finished answering the questionnaire, respectively. The first type of inconsistency found was when the respondent answered one of the options one to four in questions 17, 34 and 52, respectively; but then she gave a negative answer in questions 20, 37, or 55. The second type of inconsistency was found when, for instance, the respondent said that she started working in the current firm in august of 2008, but then replied to the control question 51 that in January 2008 she had the same labour situation or contract than she has nowadays.

1.3.4 The data on school outcomes

There are different stages in the Spanish education system until a student reaches the degree that would grant her access to higher education, and these are arranged as follows. Kindergarten education is composed of two stages, none of them compulsory. The first stage is addressed to children from ages 0 to 3 and the second stage to children from 3 to 6 years of age. Even if it is not compulsory, 98% of the children of 3 years of age were enrolled in the second stage of Kindergarten in the academic year 2008, according to the data provided by the Ministry of Education.[8] Compulsory education in Spain goes from the year the child turns 6 until the child turns 16, and is divided in two stages: Primary School, with a total of 6 grades (until the year the child turns 12, absent any repetition) and Secondary School, comprising 4 additional grades. After completing compulsory education successfully, students can choose to enrol in High-School (Bachillerato) for 2 additional years or in Vocational Training. The data collected in this project refers to children aged 3 to 18, that are enrolled in either the second stage of Kindergarten, Primary School, Secondary (compulsory) School or High-School.

For those students whose parents answered the questionnaire, the school granted me with access to the grades of their children, for all subjects and in each academic term. The format of the grades that students receive differs across the stages of education. The grades in Secondary School and High-School have a number format ranging from 1 to 10, with 10 being the best possible grade and the passing grade being bigger or equal to 5. In Primary School instead, grades can take on 5 different values: (1) Fail, (2) Pass, (3) Good, (4) Very Good and (5) Excellent. I translated the Secondary School grades for each subject into this 5-value scale following the traditional convention in the school. Those with grades 1 to 4 in Secondary School were assigned a grade of Fail (1). Those with a grade 5 in Secondary School were assigned a grade of Pass (2). Those with a grade 6 were assigned a grade of Good (3). Those with a grade of 7 or 8 were assigned a grade of Very Good (4) and finally, those with grades 9 or 10 were assigned a grade of Excellent (5) in the 5-value scale. The student in Primary, Secondary or High school receives a report with her grades three times during each academic year. In the second stage of Kindergarten, parents receive a report twice a year where different areas (Maths, Language, Arts and Musical Education) are evaluated with short sentences. These short sentences can be clearly positive (ex: the child can count from 1 to 5, the child can write her name, the child distinguishes the colors, the child can recognise the songs studied, etc.), clearly negative (ex: the child can not count from 1 to 5, the child can not write her name, etc.), or improving-type of sentences (the child has improved when counting, writing her name, etc.). In order to translate these sentences into a numeric grade for each of the areas evaluated, I have constructed two type of measures. The first type of measure (Measure 1 from now on) assigns a value of 1 to positive

[8] Source: Datos y Cifras, Curso Escolar 2012-2013, Ministerio de Educación, Cultura y Deporte.

and improving sentences, and a value of 0 to negative sentences. After doing this, I computed a simple average of the points obtained in each area in order to obtain a numeric grade ranging between 0 and 1. Multiplying by 10, this 0 to 1 grade was converted into a 0 to 10 grade, and it was translated afterwards into the 5-scale values with the same criteria outlined for Secondary School grades. The second type of measure (Measure 2 from now on), assigns a value of 1 to positive sentences and a value of 0 to improving and negative sentences. Average grades for each of the areas is then calculated in the same way.

1.4 Assessing the sample representativeness

This section assesses the ability of the final sample to reproduce the characteristics of the population. Different population definitions will be used to achieve this goal. First, I will use the population of 6th graders in Primary School in Catalonia in different academic years. Second, I will use the school population during the academic year 2011-2012 (year of data collection). Third, I will use the Spanish Labour Force Survey (LFS) to extract the sample of children aged 0 to 20 in Spain, Catalonia, and the province of Barcelona, in the 1st Quarter of 2012.

The variables analysed in subsections 1.4.2 and 1.4.3 below have answers whose options are mutually exclusive and exhaustive. This is needed in order to perform a test of goodness of fit, namely, the Pearson Chi Square test. This test establishes whether or not an observed frequency distribution differs from a theoretical distribution. In particular, it tests a null hypothesis stating that the frequency distribution of certain events observed in a sample is consistent with a particular theoretical distribution. The value of the test statistic is given by equation 1, where o_j stands for observed frequency in the sample, and e_j stands for the frequency in the theoretical distribution.

$$\chi^2 = \sum_{j=1}^{k} \frac{(o_j - e_j)^2}{e_j} \tag{1.1}$$

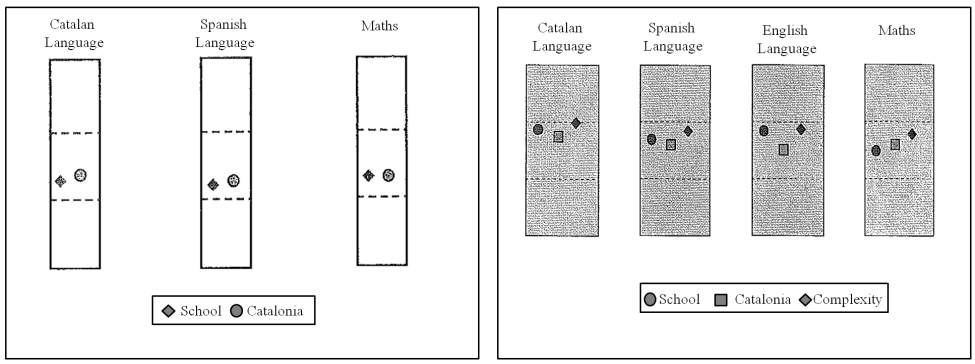
1.4.1 The school within the Catalan school system

The school where the data has been collected is a concerted school in the province of Barcelona. A concerted school is a private school, typically owned by the Catholic Church (80% of them are and it is the case also of this particular school), that signs a long-term concert or agreement with the government by which it becomes fully subsidised in exchange for implementing a state school-like admission policy (Arellano and Zamarro, 2007). As these authors point out, neither the public nor the concerted school, in principle, charge fees because they are both funded

through the taxpayer. However, in practice, the cost of attending concerted schools may be three times larger than for state schools, but in either case these are much smaller amounts than those faced by the small fraction of parents that send their children to non-concerted fee-paying private schools (Arellano and Zamarro, 2007).[9] For this particular school, the amount might vary according to the level of parental income, but for kindergarten and compulsory schooling ages, it is below or around 100 euros per month.

Figure 1 provides a description of the position of the school in the Catalan education system in terms of the achievement of its students. The information comes from a test designed and organised by the Education Department of the Catalan Government that all 6th graders in Primary School must take, including all students in public, concerted and private schools. The first test was administered in the academic year 2008-2009 and evaluated core competencies in Catalan Language, Spanish Language and Mathematics. From the next academic year it also tested the knowledge of 6th graders in English Language. The results of these tests are not publicly available, but the schools receive a document with information regarding how their students performed compared to the average school in Catalonia, and this is what is shown in Figure 1 for the academic years 2008-2009, in the left panel, and 2011-2012 in the right panel.

Figure 1: Position of the school in the Catalan Education system



Source: Primary school evaluation, 2008-2009 (left panel) and 2011-2012 (right panel). Education Department, Generalitat de Catalunya (Catalonian Government).

The results divide the level of core competencies in three categories: low (0 to 70), average (70 to 90) and high (90 to 100). The results for the academic year 2008-2009 of 6th graders in the school where the data has been collected are very close to the average results in Catalonia for the 3 tested subjects. The same can be stated about the academic year 2011-2012 on average,

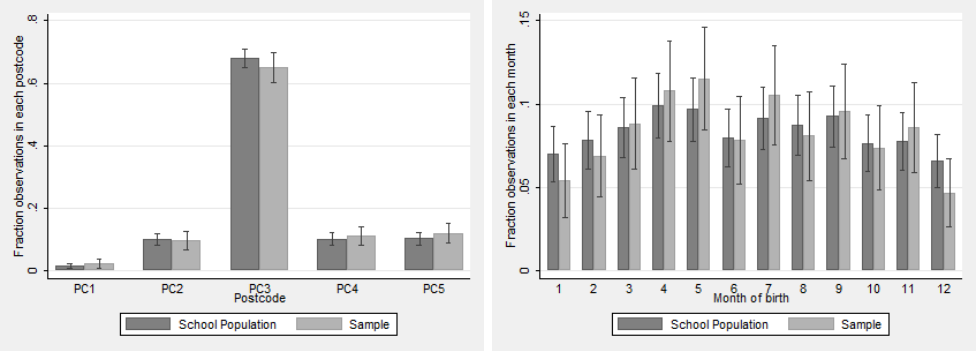
[9] According to the data for the academic year 2011-2012 offered by the Ministry of Education, 68.2% of the students in general (non-vocational) education were enrolled in public schools, 25.4% were enrolled in concerted schools and 6.4% attended private schools. Source: Datos y Cifras, Curso Escolar 2012-2013, Ministerio de Educación, Cultura y Deporte.

although they performed slightly worse in English and slightly better in Maths. The school does not have the data needed to compute whether the differences between the school results and the Catalan average results are significantly different from each other. Nevertheless, these results seem to suggest that, in terms of academic results, the school is very close to the average Catalan school.

1.4.2 How representative is the sample of the school population?

The school granted me access to the data that they had in electronic format for the population of all children enrolled at the school during the academic year 2011-2012. In particular, I got data related to the distribution of students by grades, their birth dates and the postcodes associated to the household residence for the totality of students enrolled at the school during the academic year 2011-2012.

Figure 2: Postcode and month of birth of the students. Sample and School population



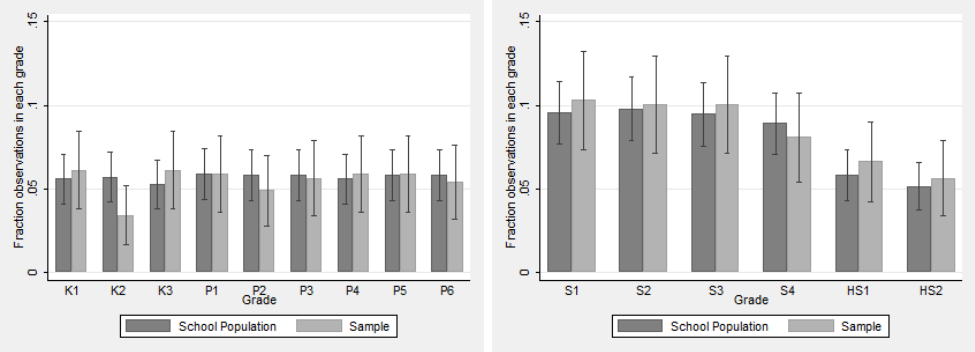
Mean (given by the height of the bar) and 95% confidence intervals. PC stands for postcode. The numbers in the x-axis of the figure on the right represent the months of the year, where 1 is January and 12 is December

The left part of Figure 2 shows the distribution of the sample and school population across postcodes. The height of the bars displays the mean (or percent of the sample/population that lives in that particular postcode) and the vertical thin lines are 95% confidence intervals. Postcodes 1 to 4 are the 4 different postcodes in the municipality where the school is located, and students living in other municipalities are grouped in postcode 5. Postcode 3 is the one where the school is located, and the one where the majority of students live.[10] In general, there are no remarkable differences between the sample and the school population regarding postcode information and according to Table 1, the results of the Pearson Chi-Square test evidence that

[10]There is a list of admission criteria that need to be evaluated in order to access Catalan public and concerted schools. Among them, the most important one is that the student that wants to access a particular school has siblings already enrolled in that school. The second most important criteria is that the student lives in the so called area of influence of the school.

there are no significant differences between the frequency distribution in the sample and the school population in terms of the postcode data.

Figure 3: Distribution of students across grade levels. Sample and School population



Mean (given by the height of the bar) and 95% confidence intervals. Grade levels: K: Kindergarden; P: Primary; S: Secondary (compulsory); HS: High School

The information related to the month of birth of students in the sample and the school population in the academic year 2011-2012 is plotted on the right part of Figure 2, and the results of the Pearson's Chi Square test are shown in Table 1. Again, I can not reject the null hypothesis that the frequency distribution of the month of birth observed for the students in the sample is consistent with the distribution observed for the school population. Similarly, students in the sample are distributed throughout all the academic levels. This can be seen in Figure 3, and in the results concerning the goodness-of-fit tests shown in Table 1.

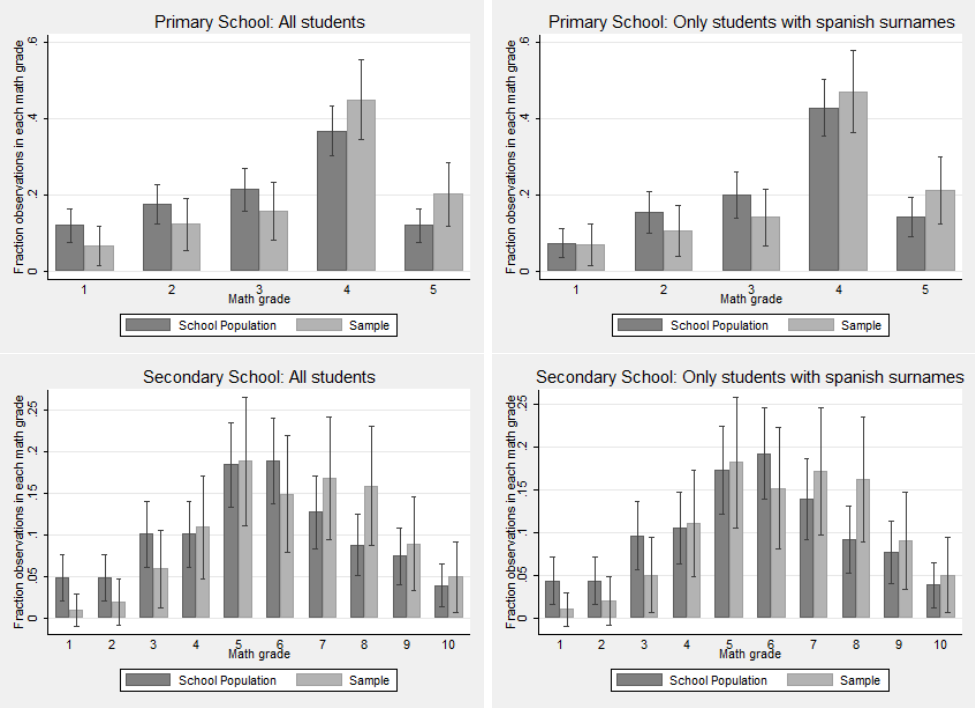
Table 1: **Frequency distribution in the sample and school population (1)**

	Pearson Chi-Square Test and P-value
Postcode	2.7073
	(0.608)
Month of birth	8.1924
	(0.696)
Distribution across grades	6.684
	(0.946)

P-values for Pearson's Chi Square Test in parentheses.

I also got access to data on school outcomes for the school population. Unfortunately, this data was not available in electronic format for all the school population, but just for some groups (e.g. for some subjects, grades and classes). Therefore, the figures and tables below do not use data of all the students in the final sample, but rather of those students enrolled in grades for which I also observe the final outcomes of the school population. The data both for the sample and the school population refers to the 3rd term of the academic year 2011-2012.

Figure 4: School performance in Mathemathics. Sample and School population



Mean (given by the height of the bar) and 95% confidence intervals. Data refers to the 3rd term of the academic year 2011-2012

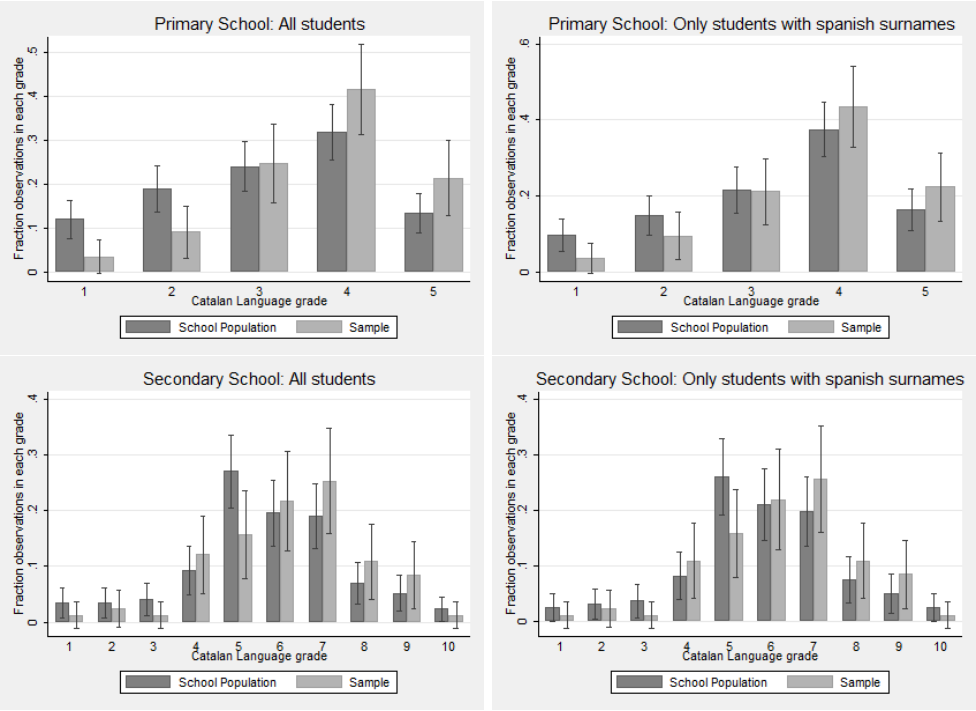
Figure 4 displays the data related to school performance in mathematics in the sample and the school population. The top panels restrict the data to primary school students (grades can take on values between 1 and 5, where 1 stands for Fail and 5 for Excellent) whereas the bottom panels of the figure show the data for students in compulsory secondary schooling (grades take on values between 1 and 10, where 5 is the passing grade and 10 is the best outcome). The right part of the figure restricts both the sample and the school population to include only those students with Spanish-like surnames.[11] The reason to exclude those students that are likely to be children of immigrant parents is that those children tend to perform worse at school and my sample is very likely not representative of the immigrant population at the school given their very low response rate. Figure 4 shows that even if both for primary and secondary school stages, the students in the sample perform better than those in the school population, the differences are reduced once the data is restricted to take into account only those students with Spanish-like surnames. Moreover, the results in Table 2 show that there are not significant differences in the

[11]Unfortunately, I can not restrict the data to include only students of Spanish nationality since I do not have data on the nationality of children/parents in the school population data. Restricting the data to include only those students with Spanish-like surnames is just an approximation, since children of Latino origin will still be included.

frequency distribution of mathematical scores between the sample and the school population for both Primary and Secondary school students with Spanish-like surnames. It is reasonable to think, therefore, that the differences we observe in the graph would further decrease if I could restrict both the sample and the school population to include only children of Spanish parents.

A very similar pattern emerges in Figure 5, that displays school performance in Catalan Language in both the sample and the school population. Students in the sample perform slightly better than those in the school population even after restricting the data to include only students with Spanish-like surnames. However, there are no significant differences in the frequency distribution between the sample and the school population once the data has been restricted to students with Spanish-like surnames, as it can be seen in Table 2.

Figure 5: School performance in Catalan Language. Sample and School population



Mean (given by the height of the bar) and 95% confidence intervals. Data refers to the 3rd term of the academic year 2011-2012

Finally, Figure 6 shows the school performance in Physical education. Compared to the scores in Mathematics and Catalan language, there are no students failing to pass this subject in primary school, and almost no students failing in secondary school. Still, students in the sample perform better than students in the school population, even if the null hypothesis of

Table 2: **Frequency distribution in the sample and school population (2)**

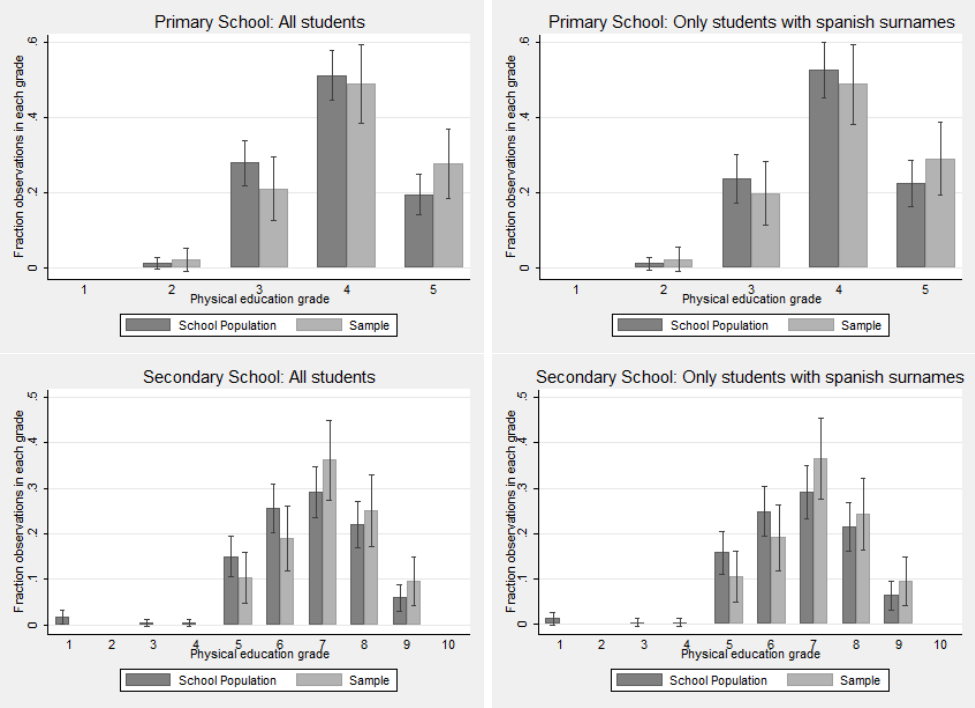
	Pearson Chi-Square Test and P-value			
	Primary	Primary, Spanish surnames	Secondary	Secondary, Spanish surnames
Math	10.5946	5.9446	15.0387	13.2132
	(0.032)	(0.203)	(0.090)	(0.153)
Catalan language	17.6067	7.615	13.2443	12.2912
	(0.001)	(0.107)	(0.152)	(0.197)
Physical education	5.2492	2.9	10.1181	10.2177
	(0.154)	(0.407)	(0.072)	(0.069)

P-values for Pearson's Chi Square Test in parentheses.

consistent frequency distributions in the sample and school population can not be rejected.

Unfortunately, the data I have available for the whole population of students in the school in 2012 does not allow me to discern respondents from non respondents in order to analyse whether some of the available characteristics (postcode, month of birth, enrolled in which grade and final grade outcome in 2012 for some subjects) play an important role in the decision to cooperate (i.e. responding the questionnaire). However, the previous comparison of the available data for the school population with the sample data seems to suggest that the sample is representative of the school population as long as students with an immigrant background are excluded from both the sample and school population. Therefore, given that I don't have the appropriate information to construct sample weights, in what follows I will present results for the whole sample and when students with an immigrant background are excluded. My fundamental working assumption is that conditional on the immigration status of their parents, students from non-respondent households are missing at random or $f(G|I) = f(G|I, D = 1)$ (see Little and Rubin (1987)), where G is the outcome variable of interest (i.e. a measure of school performance), I is a dummy variable equal to 1 if the father has Spanish nationality, and $D = 1$ indicates participation in the survey.

Figure 6: School performance in Physical Education. Sample and School population



Mean (given by the height of the bar) and 95% confidence intervals. Data refers to the 3rd term of the academic year 2011-2012

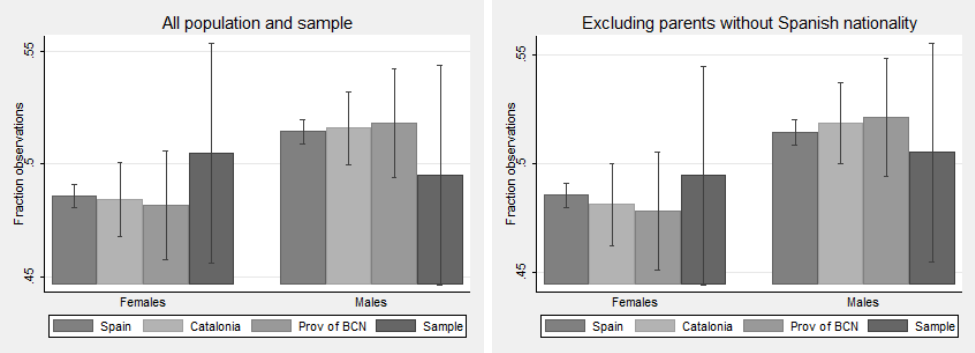
1.4.3 The characteristics of the sample compared to those in the population given by the Spanish Labour Force Survey

In this section I use the data of the Spanish Labour Force Survey (LFS) to assess how the distribution of some key characteristics of the individuals in my sample compares to the distribution of these same characteristics in the Spanish, Catalan and (province of) Barcelona population. Even if with this exercise I do not pretend to claim whether my sample is representative of these populations or not, it is nonetheless interesting to see if the distribution of some parental characteristics in my sample resembles the distribution of these same characteristics in the populations defined above.

In order to do so, I have used the LFS data produced by the Spanish National Institute of Statistics (INE) corresponding to the 1st quarter of 2012, and I have extracted the subsample of individuals aged 0 to 20. Since the age data is given in 5 year interval age groups, and given that the individuals in my sample have ages ranging from 3 to 18, this is the closest I can get to the population of my sample using the LFS data. Using the information on family ties, I have matched these individuals with the information of their parents (this information is available as

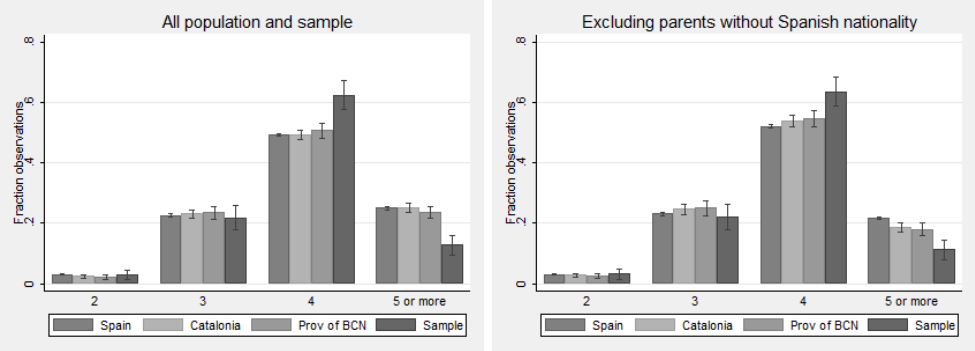
long as they live in the same household). For each of the variables analysed I produce two types of graphical and goodness-of-fit test comparisons. First, I use all the sample and individuals in the population for the 3 different regional levels (left part of the graphs and Table 3). Second, led by the evidence in the previous section, I restrict the sample and the different regional populations to include only those individuals whose parents have Spanish nationality (right part of the graphs and Table 3).

Figure 7: Gender of the student



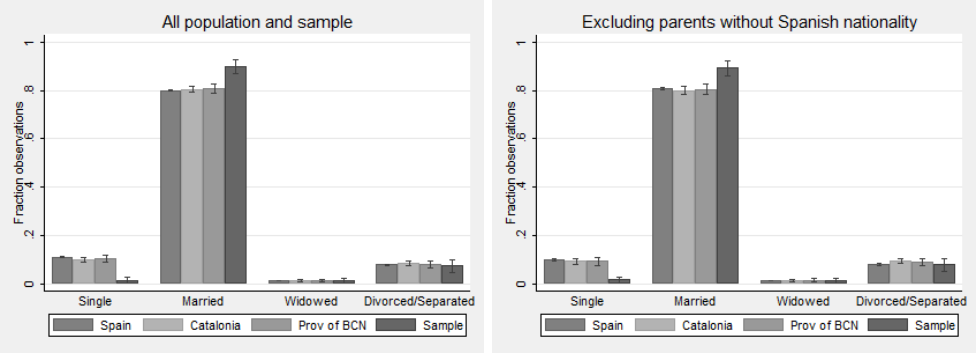
Mean (given by the height of the bar) and 95% confidence intervals. Population data refers to the 1st Quarter of 2012 of the Spanish LFS. Weights have been used for the LFS data.

Figure 8: Household size



Mean (given by the height of the bar) and 95% confidence intervals. Population data refers to the 1st Quarter of 2012 of the Spanish LFS. Weights have been used for the LFS data.

Figure 9: Mother's civil status



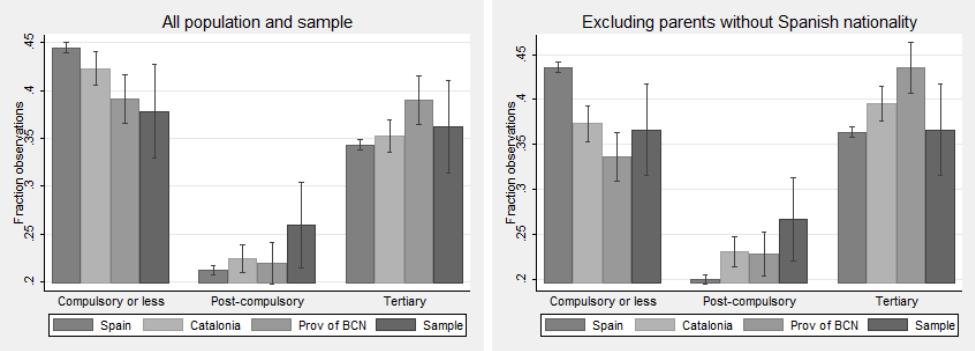
Mean (given by the height of the bar) and 95% confidence intervals. Population data refers to the 1st Quarter of 2012 of the Spanish LFS. Weights have been used for the LFS data.

Figures 7, 8 and 9 show the gender distribution of individuals aged 0 to 20, the size of their households, and the civil status of their mothers in the final sample, and in the 3 different populations, respectively. Figure 7 shows the fraction of observations that correspond to males and females. Both in the left and the right part of the figure, there is a higher percentage of females in the sample if compared to the populations in Spain, Catalonia and the province of Barcelona. The non-significant Pearson Chi-square statistics in Table 3, though, imply that the null hypothesis of consistent frequency distributions between the sample and the population can not be rejected in any of the cases (i.e. for the 3 regional levels when considering all the sample and population, and for the 3 regional levels when considering only those individuals with Spanish parents). Figure 8 exhibits the distribution of household sizes. More than 60% of the students in the household live in a 4 person household, and in general, the average household size is slightly smaller in the sample than in the population(s) -even if the median value is of 4 people both in the sample and the different LFS populations. Figure 9 presents the data on the civil status of the mother. I consider the data on mothers rather than fathers given that in the majority of cases, when the student lives with one of the parents, it does so with the mother (in the sample, all individuals living with just one parent live with the mother). There is a higher fraction of married mothers and a lower fraction of single mothers in my sample if compared to any of the 3 regional levels.[12] The results in Table 3 confirm that, in all the cases analysed, the frequency distribution of the mother's civil status in the sample differs from the frequency distribution in the population.

[12]This could be partly related to the fact that the LFS data includes individuals aged 0 to 3, and mothers in this age group might be more likely to have a single civil status than mothers with older children. In fact, the fraction of single mothers decreases considerably when I do not consider individuals aged 0 to 5 in the Spanish population

The distribution of father's education, father's labour status and father's firm sector of activity are presented in Figures 10, 11 and 12, respectively, whereas the results for Pearson's Chi Square tests are shown in the second panel of Table 3. In general, there is a higher fraction of fathers in the sample with post-compulsory (non-tertiary) education if compared to any of the 3 different populations extracted from the LFS, and whether we use all the population or we restrict the sample to include only children from Spanish individuals. Nonetheless, the results in Table 3 indicate that the frequency distribution of education levels for fathers in the sample resembles that of fathers in Catalonia and Barcelona when all the population is considered, and that of Catalonia when I restrict the sample to Spanish nationals.

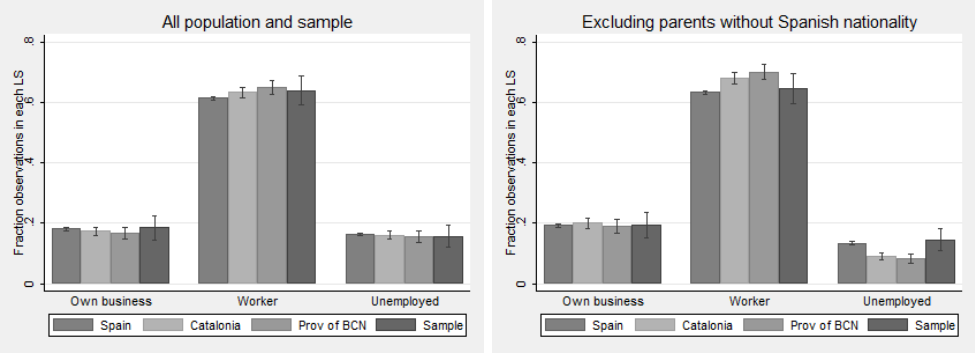
Figure 10: Father's education



Mean (given by the height of the bar) and 95% confidence intervals. Population data refers to the 1st Quarter of 2012 of the Spanish LFS. Weights have been used for the LFS data.

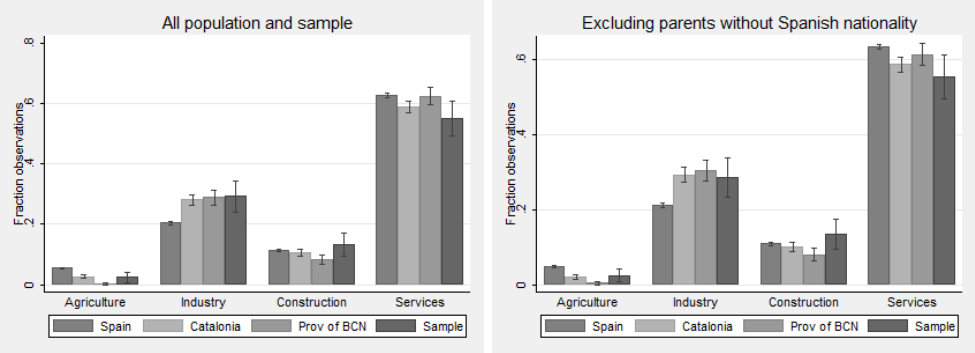
Figure 11 presents the distribution of father's labour status, considering those that own a business, work for a firm or are unemployed. The sample distribution when all the population is considered is almost identical to the distribution in Spain, Catalonia and the province of Barcelona. The results in Table 3 (left part of the table), show that there are no significant differences in the frequency distribution of father's labour status between the sample and the population(s). However, once I restrict the sample to include only those individuals with Spanish parents, the null hypothesis can not be rejected only at the Spanish level. For those fathers that are working, the distribution regarding the sectors of activity of the firm are plotted in Figure 12. Both for all the population and for the restricted one, the frequency distribution of the sectors in the sample resembles that of Catalonia.

Figure 11: Father's labour status



Mean (given by the height of the bar) and 95% confidence intervals. Population data refers to the 1st Quarter of 2012 of the Spanish LFS. Weights have been used for the LFS data.

Figure 12: Father's sector of the firm



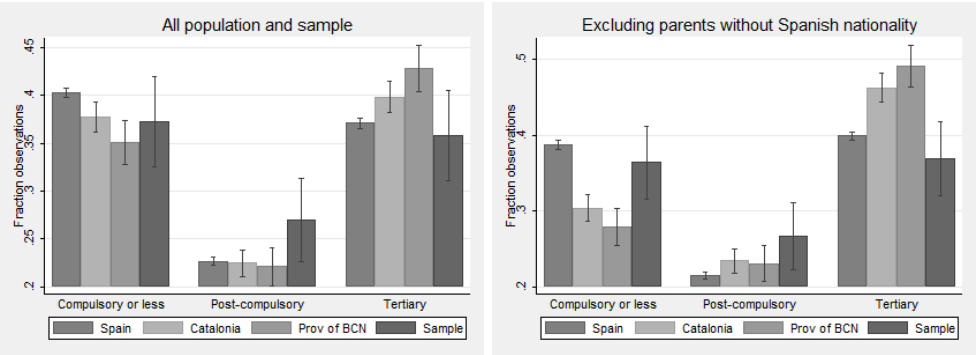
Mean (given by the height of the bar) and 95% confidence intervals. Population data refers to the 1st Quarter of 2012 of the Spanish LFS. Weights have been used for the LFS data.

The same information is presented for the characteristics related to the mother. The distributions are plotted in Figures 13, 14 and 15 and the results for the goodness-of-fit tests are presented in the bottom panel of Table 3. Figure 13 suggests that mothers in the sample have a lower level of education, even when the data is restricted to include only those individuals with Spanish parents, especially when compared with the mothers in the Catalan population and the population in the province of Barcelona. According to the results in Table 3, the frequency distribution of the education level of mothers in the sample resembles that of the population of mothers (of children aged 0 to 20) in Spain and Catalonia, but only when the unrestricted data is used (left part of Table 3). Figure 14 shows that in the first quarter of 2012 more mothers in the sample were employed both in the self-employed and salaried worker categories, and as a result, there is a lower fraction of unemployed mothers or homemakers if compared to the mothers of

children aged 0 to 20 in Spain, Catalonia or the province of Barcelona. The null hypothesis of consistent frequency distributions between the sample and the LFS populations is rejected in all cases in Table 3. In Figure 15 the observations are restricted to those individuals whose mothers are employed in the first quarter of 2012. More than 80% of the mothers have jobs related to service activities, and there's a very few percent of them working in the agriculture or construction sectors. The results in Table 3 suggest that the frequency distributions in the sample and population are very similar since the null hypothesis of the Pearson's Chi Square test can't be rejected in 5 out of the 6 cases.

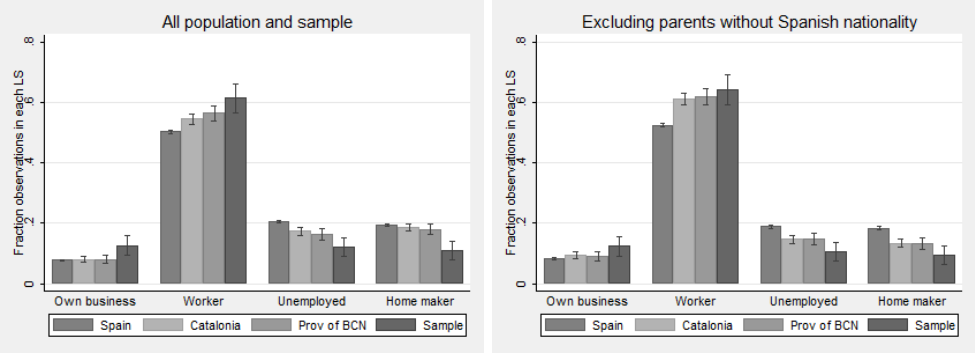
The descriptive analysis in this section suggests that the sample, even if restricted in terms of size and concentrated in only school, is sufficiently diverse to reproduce some of the most representative characteristics of the population with children aged between 0 and 20 (as given by the data in the Spanish LFS). Although these results can not be overplayed and I can not claim that the sample is somehow representative of the Spanish or Catalan population, the evidence suggests that the sample reproduces fairly well the distribution of father's education and father's main sector of activity in Catalonia as well as the labour status of Spanish fathers.

Figure 13: Mother's education



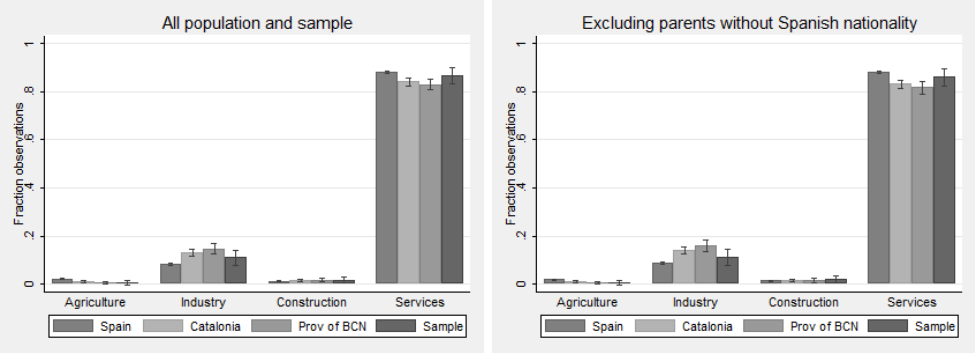
Mean (given by the height of the bar) and 95% confidence intervals. Population data refers to the 1st Quarter of 2012 of the Spanish LFS. Weights have been used for the LFS data.

Figure 14: Mother's labour status



Mean (given by the height of the bar) and 95% confidence intervals. Population data refers to the 1st Quarter of 2012 of the Spanish LFS. Weights have been used for the LFS data.

Figure 15: Mother's sector of the firm



Mean (given by the height of the bar) and 95% confidence intervals. Population data refers to the 1st Quarter of 2012 of the Spanish LFS. Weights have been used for the LFS data.

Table 3: **Sample versus Population: Pearson's Chi Square Test**

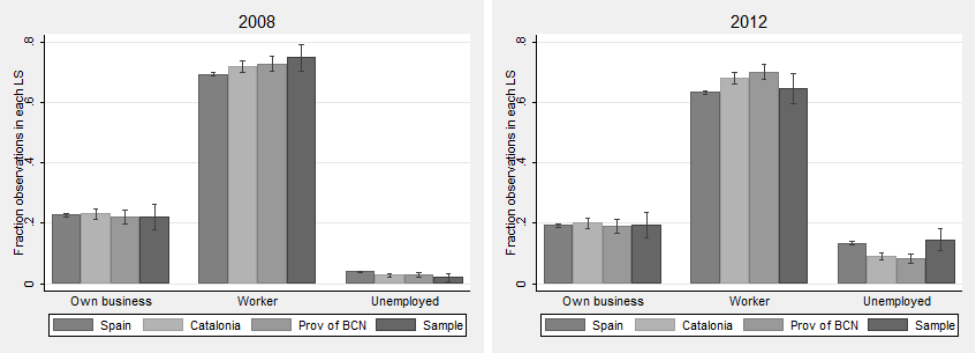
	All population and sample				Excluding parents without Spanish nationality			
	Spain	Catalonia	Barcelona	Obs	Spain	Catalonia	Barcelona	Obs
Sex students	0.628	0.628	0.795	408	0.167	0.262	0.377	382
	(0.428)	(0.428)	(0.373)		(0.682)	(0.609)	(0.539)	
Household size	38.189	40.425	34.517	408	29.187	18.842	17.36	382
	(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.001)	
Civil status mother	39.081	34.985	35.371	408	30.261	29.031	29.236	382
	(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)	
Father's education	8.147	3.914	3.56	378	11.223	2.506	7.055	352
	(0.017)	(0.141)	(0.169)		(0.004)	(0.286)	(0.029)	
Father's labour situation	0.496	0.204	0.707	371	0.249	12.461	16.658	346
	(0.780)	(0.903)	(0.702)		(0.883)	(0.002)	(0.000)	
Father's firm sector	20.279	3.084	48.017	294	15.842	4.281	49.611	280
	(0.000)	(0.379)	(0.000)		(0.001)	(0.233)	(0.000)	
Mother's education	4.151	5.128	9.816	408	6.221	13.781	24.251	382
	(0.125)	(0.077)	(0.007)		(0.045)	(0.001)	(0.000)	
Mother's labour situation	50.801	33.669	30.302	392	48.168	13.404	13.497	366
	(0.000)	(0.000)	(0.000)		(0.000)	(0.004)	(0.004)	
Mother's firm sector	7.935	2.831	4.047	389	5.771	3.892	6.014	363
	(0.047)	(0.418)	(0.256)		(0.123)	(0.273)	(0.111)	

P-values for Pearson's Chi Square Test in parentheses. Population data refers to the 1st Quarter of 2012 of the Spanish LFS. Weights have been used for the LFS data. The results for Barcelona refer to the province of Barcelona.

1.4.4 The labour market impact of the Great Recession in the Spanish Population and in the sample

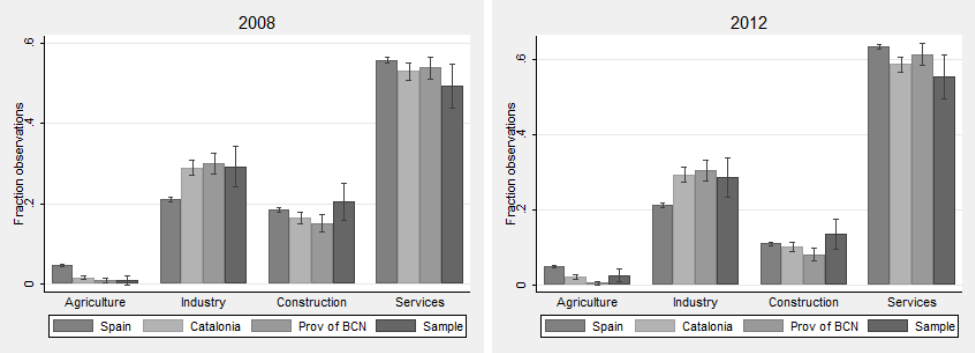
As in the previous section, I compare the sample data with the LFS data for individuals aged 0 to 20 and analyse the distribution of some key labour market characteristics of their parents before the Great Recession (1st quarter of 2008) and when the data was collected (1st quarter of 2012). In particular, I look at the labour status and, if working, the sector of the firm, for fathers (Figures 16 and 17) and mothers (Figures 18 and 19) with Spanish nationality, to see if the crisis has had a differential effect in the sample and the LFS populations.

Figure 16: Father's labour status in 2008 and 2012



Mean (given by the height of the bar) and 95% confidence intervals. Population data refers to the 1st Quarter of 2008 and 2012 of the Spanish LFS. Weights have been used for the LFS data. Excluding individuals without Spanish nationality

Figure 17: Father's sector of employment in 2008 and 2012



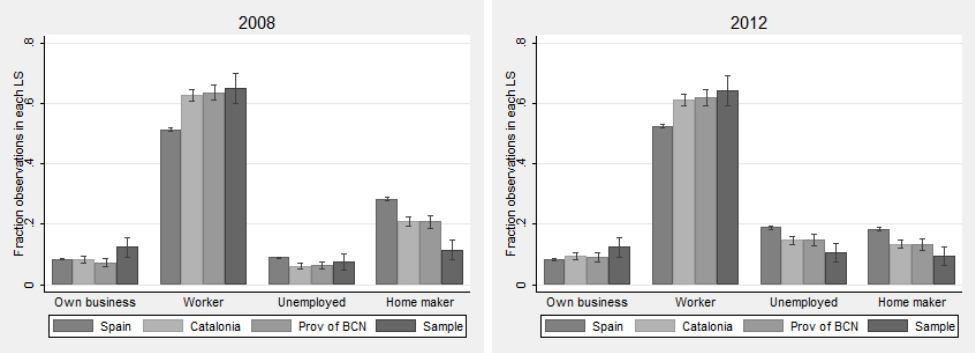
Mean (given by the height of the bar) and 95% confidence intervals. Population data refers to the 1st Quarter of 2008 and 2012 of the Spanish LFS. Weights have been used for the LFS data. Excluding individuals without Spanish nationality

As shown in Figure 16, the crisis has destroyed slightly more employment for fathers in the sample than in the LFS populations. This might have been related to the fact that there was a higher percent of fathers working in the construction sector at the beginning of the crisis in the sample (see Figure 17) and this sector has concentrated the greatest share of employment destruction since the onset of the crisis in 2008.[13] According to the results in Table 4 there were no significant differences in the frequency distribution of father's labour situation between the sample and the LFS populations at the beginning of the crisis, although the frequency distribution in the sample resembled the frequency distribution in the province of Barcelona the

[13] According to the LFS data provided by the Spanish National Institute of Statistics, the active population of men working in the construction sector decreased by over 1200000 people from the first quarter of 2008 to the first quarter of 2012, from a total of approximately 2775000 men working in the construction sector at the beginning of the crisis.

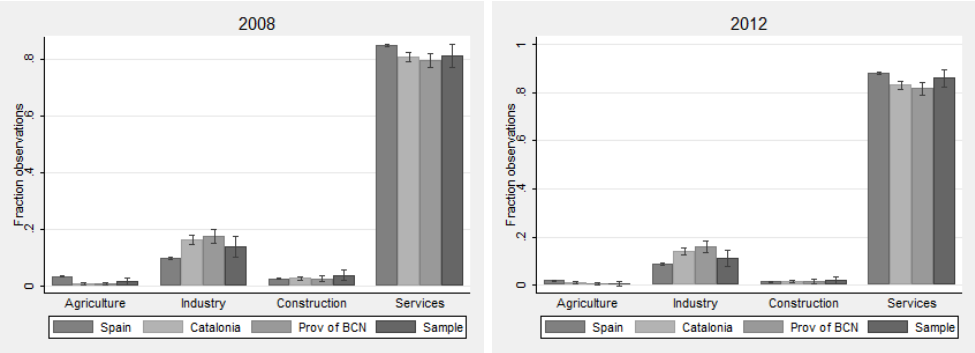
most. At the moment of data collection, and given to a bigger increase in unemployment in the sample, the frequency distribution of father's labour status in the sample was not significantly different from the frequency distribution in the Spanish population instead (see Table 3). The impact of the Great Recession on the labour status of mothers in the sample differs from that described for fathers, since it is among mothers in the sample where unemployment increases the least between 2008 and 2012 (see Figure 18).

Figure 18: Mother's labour status in 2008 and 2012



Mean (given by the height of the bar) and 95% confidence intervals. Population data refers to the 1st Quarter of 2008 and 2012 of the Spanish LFS. Weights have been used for the LFS data. Excluding individuals without Spanish nationality

Figure 19: Mother's sector of employment in 2008 and 2012



Mean (given by the height of the bar) and 95% confidence intervals. Population data refers to the 1st Quarter of 2008 and 2012 of the Spanish LFS. Weights have been used for the LFS data. Excluding individuals without Spanish nationality

Table 4: **Sample versus Population in 2008: Pearson's Chi Square Test**

	Spain	Catalonia	Barcelona (Prov)	Obs
Father's labour situation	4.3832	1.2904	0.9751	345
	(0.112)	(0.525)	(0.614)	
Father's firm sector	21.0321	4.8471	7.4113	312
	(0.000)	(0.183)	(0.025)	
Mother's labour situation	58.8567	23.8495	31.8322	359
	(0.000)	(0.000)	(0.000)	
Mother's firm sector	14.3912	7.4041	8.7274	353
	(0.002)	(0.060)	(0.033)	

P-values for Pearson's Chi Square Test in parentheses. Population data refers to the 1st Quarter of 2008 of the Spanish LFS. Weights have been used for the LFS data. The results for Barcelona refer to the province of Barcelona.

1.5 Final remarks

Starting in the 1960s, the study of human capital formation has been on the centre stage of the economic debate. Recent evidence has shown that parental job loss influences the school performance of their offspring and can therefore impact the human capital or maximum level of education attained by an individual. The developments taking place in the Spanish labour market since the onset of the Great Recession provide a good scenario to further explore the impact of parental job loss on their children's school performance. Since no data was available to fulfill this purpose, I designed a survey to collect (panel) data retrospectively on school performance and parental employment history in a school in the province of Barcelona. The purpose of this chapter has been to describe the main features of the making of the survey, the data collection process and the characteristics of the sample.

Regarding the description of the characteristics of the sample, the results in this chapter show that in terms of academic results, the school is very close to the average Catalan school. Moreover, compared to the data concerning all the school population, the analysis performed here seems to suggest that the sample is representative of the school population as long as students with an immigrant background are excluded from the analysis. Additionally, the descriptive analysis performed by comparing some characteristics of the sample with those in the Spanish, Catalan or province of Barcelona population suggests that the sample, even if restricted in terms of size and concentrated in only one school, is sufficiently diverse to reproduce some of the most representative characteristics of the Spanish population with children aged between 0 and 20. Although these results can not be overplayed and I can not claim that the sample is somehow representative of the Spanish or Catalan population, the evidence suggests that the sample reproduces fairly well the distribution of father's education and father's main sector of activity in Catalonia as well as the labour status of Spanish fathers. Finally, regarding the impact of the

Great Recession, the crisis has destroyed slightly more employment for fathers in the sample than in Spain, Catalonia or the province of Barcelona. This might have been related to the fact that there was a higher percent of fathers working in the construction sector at the beginning of the crisis in the sample and this sector has concentrated the greatest share of employment destruction since the onset of the crisis in 2008.

1.6 Appendix

1.6.1 Questionnaire in English

The original questionnaire, in Spanish and with the original format, can be found at the end of this chapter. Below you can find the English translation of the questions contained both in the household and the individual questionnaire.

Household questionnaire

For each child enrolled at the school where the survey took place, the parent answering the household questionnaire was asked to provide the following information:

- Name / Surnames
- Date of birth / Sex / Grade
- Is it your: Child / Step child. In the case that the child is your step child: since when do you live together?
- For your current partner, is it his/her: Child / Step child. In the case that the child is his/her step child: since when do they live together?

For each child not enrolled at the school where the survey took place, the information asked was the following:

- Sex / Date of birth / Lives in the current dwelling? / Is it your child or step child? / For your partner, is it his/her child or step child?

The remaining questions in the household questionnaire are as follows (the numbers correspond to those in the original questionnaire):

1. Who fills the household questionnaire? Father/Mother
2. Number of people living NOWADAYS in the household, including yourself:
3. How many children do you have? (Include also the children of your partner)

4. Your current dwelling is? Owned, fully paid / Owned, mortgage payments pending / Rented / Rent free
5. Current neighborhood
6. Since when do you live in your current dwelling? Month/Year
7. Have you and your children always lived in the current dwelling? Yes (End of the household questionnaire) / No (go to question 8)
8. Your previous dwelling was: Owned / Rented / Rent free
9. Previous neighborhood

Individual questionnaire

The individual questionnaire is divided into the personal information section and the labour market situation sections. The numbers of the questions below correspond to those in the original questionnaire:

Personal information

1. Who fills this questionnaire? Father/Mother
2. Date of birth: Month/Year
3. Nationality: Spanish/Other
4. If other nationality, since when are you in Spain? Month/Year
5. Language spoken at home: Spanish / Catalan / Other
6. Your maximum level of studies attained is:
   (a) Without studies, or attended school less than 5 years
   (b) Primary (attended school more than 5 years but did not complete compulsory education)
   (c) Compulsory education
   (d) Vocational I (access after compulsory education)
   (e) High-School
   (f) Vocational II (access after High-School)

(g) University degree (undergraduate and graduate programs)

(h) Other. Specify:

7. Maximum level of studies attained by your father / mother

8. Current civil status: Single / Living with partner / Married / Widowed / Separated-Divorced

9. Since when is this your civil status? Month/Year

10. Civil status previous to your current status: Single / Living with partner / Married / Widowed / Separated-Divorced

11. Did you ever belong to the Association of fathers and mothers of the school? Yes/No

12. (If answer to the previous question is Yes) When was the first time you were part of the association? Month/Year

13. Once your children finish compulsory education, who will have the last word on the decision of whether they continue studying or not (mark one option): Parents / Teachers / Children

14. Current type of labour contract of your current partner: Permanent / Fixed term / Does not correspond

15. Type of labour contract of your current partner two years ago: Permanent / Fixed term / Does not correspond

16. Type of labour contract of your current partner four years ago: Permanent / Fixed term / Does not correspond

Information regarding your CURRENT labour situation

The second section of the individual questionnaire collects information on the labour situation of the respondent, and it is divided in three parts. The first part gathers information on the labour situation of the respondent at the moment when the survey took place (February 2012).

17. What is your current (main) labour market situation? Choose an option:

(a) Own business

(b) Salaried worker (mark this option if you are a salaried worker, even if you don't have a contract)

(c) Work for another household (Household worker)

(d) Helps in the family business

(e) Unemployed

(f) Homemaker

(g) Retired or permanent sickness

(h) Student, not working

18. If answered *e* to *h* in the previous question (number 17): since when is this your labour market situation? Month/Year

19. NET monthly income in euros (includes your salary, unemployment benefits, pension, or other subsidies): Less than 999 euros / Between 1000 and 1499 euros / Between 1500 and 1999 euros / More than 2000 euros

20. Do you own a business or are you a salaried worker, work for another household or help in the family business? Yes (go to question 21) / No (go to question 33)

21. Type of contract: Permanent / Fixed term / Does not have a contract / Special Regime of household workers / Does not correspond (own business)

22. Starting date of your current contract (leave blank if you don't have a contract): Month/Year

23. Since when do you work for your current firm? Month/Year

24. Your firm belongs to the: Private sector / Public sector

25. Do you work...? Full time / Part time

26. Firm size (number of workers): Only myself / From 2 to 9 / From 10 to 49 / From 50 to 249 / More than 250

27. Firm's main industry:

(a) Agriculture, Forestry, Fishing

(b) Manufacturing, Mining, Utilities

(c) Construction

(d) Accommodation and Food Services

(e) Cleaning

(f) Other service sector activities

(g) Other: Indicate...

28. Motivation at work (mark an option from 1 to 5, where 1 stands for Not motivated and 5 for Very motivated)

The next section needs to be filled only by those respondents that in February 2012 had a temporary/fixed-term contract:

29. Duration, in months, of your current contract

30. When does your current contract end? Month/Year

31. Do you know if you will get an extension of your contract when it finishes? Yes / I think so / I don't think so / No

32. Do you think it will be easy to find a job when this contract ends? (mark an option from 1 to 5, where 1 stands for "Not easy" and 5 for "Very easy")

Information regarding your labour situation two years ago (JANUARY 2010)

33. Two years ago (in January 2010) was your labour situation the same as your current one?

    (a) Yes, I had the same labour situation or the same contract as I have now (go to question 51)

    (b) No, I had a different labour situation or a different contract than the one I have now (keep on aswering in question 34)

34. What was your main labour market situation TWO YEARS AGO? Choose an option:

    (a) Own business

    (b) Salaried worker (mark this option if you are a salaried worker, even if you don't have a contract)

    (c) Work for another household (Household worker)

    (d) Helps in the family business

    (e) Unemployed

    (f) Homemaker

    (g) Retired or permanent sickness

    (h) Student, not working

35. If answered e to h in the previous question (number 34): since when was this your labour market situation? Month/Year

36. NET monthly income in euros two years ago (includes your salary, unemployment benefits, pension, or other subsidies): Less than 999 euros / Between 1000 and 1499 euros / Between 1500 and 1999 euros / More than 2000 euros

37. Two years ago, were you owning a business or were you a salaried worker, worked for another household or helped in the family business? Yes (go to question 38) / No (go to question 51)

38. Type of contract in January 2010: Permanent / Fixed term / Does not have a contract / Special Regime of household workers / Does not correspond (own business)

39. Starting date of the contract you had in January 2010 (leave blank if you didn't have a contract): Month/Year

40. Since when were you working at the firm you were working for in 2010? Month/Year

41. The firm you were working for in 2010 belonged to the: Private sector / Public sector

42. Did you work...? Full time / Part time

43. Firm size (number of workers): Only myself / From 2 to 9 / From 10 to 49 / From 50 to 249 / More than 250

44. Firm's main industry:

    (a) Agriculture, Forestry, Fishing

    (b) Manufacturing, Mining, Utilities

    (c) Construction

    (d) Accommodation and Food Services

    (e) Cleaning

    (f) Other service sector activities

    (g) Other: Indicate...

45. Motivation at work (mark an option from 1 to 5, where 1 stands for Not motivated and 5 for Very motivated)

46. Why isn't this your current labour situation?

    (a) Left work voluntarily

    (b) End temporary contract

    (c) I was fired

    (d) Firm downsize

    (e) Firm closure

    (f) Other reason

The next section needs to be filled only by those respondents that in January 2010 had a temporary/fixed-term contract:

47. Duration, in months, of the contract you had in January 2010
48. When did that contract end? Month/Year
49. Did you get an extension of the contract in the same firm? No/Yes. If yes, for how many more months?
50. When did you know if you would get an extension or not? Month/Year

Information regarding your labour situation four years ago (JANUARY 2008)

51. Four years ago (in January 2008) was your labour situation the same as your current one?
    (a) Yes, I had the same labour situation or the same contract as I have now (End of the questionnaire)
    (b) No, but I had the same situation as in January 2010 (End of the questionnaire)
    (c) No, I had a different labour situation or a different contract than the one I had in January 2010 (keep on aswering in question 52)
52. What was your main labour market situation FOUR YEARS AGO? Choose an option:
    (a) Own business
    (b) Salaried worker (mark this option if you are a salaried worker, even if you don't have a contract)
    (c) Work for another household (Household worker)
    (d) Helps in the family business
    (e) Unemployed
    (f) Homemaker
    (g) Retired or permanent sickness
    (h) Student, not working
53. If answered e to h in the previous question (number 52): since when was this your labour market situation? Month/Year
54. NET monthly income in euros four years ago (includes your salary, unemployment benefits, pension, or other subsidies): Less than 999 euros / Between 1000 and 1499 euros / Between 1500 and 1999 euros / More than 2000 euros

55. Four years ago, were you owning a business or were you a salaried worker, worked for another household or helped in the family business? Yes (go to question 56) / No (End of the questionnaire)

56. Type of contract in January 2008: Permanent / Fixed term / Does not have a contract / Special Regime of household workers / Does not correspond (own business)

57. Starting date of the contract you had in January 2008 (leave blank if you didn't have a contract): Month/Year

58. Since when were you working at the firm you were working for in 2008? Month/Year

59. The firm you were working for in 2008 belonged to the: Private sector / Public sector

60. Did you work...? Full time / Part time

61. Firm size (number of workers): Only myself / From 2 to 9 / From 10 to 49 / From 50 to 249 / More than 250

62. Firm's main industry:

    (a) Agriculture, Forestry, Fishing
    (b) Manufacturing, Mining, Utilities
    (c) Construction
    (d) Accommodation and Food Services
    (e) Cleaning
    (f) Other service sector activities
    (g) Other: Indicate...

63. Motivation at work (mark an option from 1 to 5, where 1 stands for Not motivated and 5 for Very motivated)

64. Why wasn't this your labour situation in January 2010?

    (a) Left work voluntarily
    (b) End temporary contract
    (c) I was fired
    (d) Firm downsize
    (e) Firm closure
    (f) Other reason

The next section needs to be filled only by those respondents that in January 2008 had a temporary/fixed-term contract:

65. Duration, in months, of the contract you had in January 2008
66. When did that contract end? Month/Year
67. Did you get an extension of the contract at the same firm? No/Yes. If yes, for how many more months?
68. When did you know if you would get an extension or not? Month/Year

1.6.2 Item non-response

Table A1: **Item non response. Household questionnaire**

Question number	Description	Missing	% Missing
HH1	who fills	4	1.37
HH2	n. people	0	0
HH3	n. children	0	0
HHSib1.1	sex sib1	4	1.37
HHSib1.2	birthmonth sib1	8	2.74
HHSib1.3	birthyear sib1	7	2.4
HHSib1.4	lives home sib1	1	0.34
HHSib1.5	same mother sib1	3	1.03
HHSib1.6	same father sib1	3	1.03
HHSib2.1	sex sib2	3	1.03
HHSib2.2	birthmonth sib2	5	1.71
HHSib2.3	birthyear sib2	5	1.71
HHSib2.4	lives home sib2	0	0
HHSib2.5	same mother sib2	1	0.34
HHSib2.6	same father sib2	1	0.34
HHSib3.1	sex sib3	1	0.34
HHSib3.2	birthmonth sib3	1	0.34
HHSib3.3	birthyear sib3	1	0.34
HHSib3.4	lives home sib3	1	0.34
HHSib3.5	same mother sib3	1	0.34
HHSib3.6	same father sib3	1	0.34
HH4	Type property	0	0
HH5	Neighborhhod	2	0.68
HH6.1	Month moving	18	6.16
HH6.2	Year moving	6	2.05
HH7	Same house	0	0
HH8	Previous type property	1	0.34
HH9	Previous neighborhood	3	1.03

HH stands for household questionnaire. HHSib refers to questions regarding siblings not enrolled in the school where the survey took place. The percent is calculated over 292 answers.

Table A2: **Item non response. Father's questionnaire**

Question number	Description	% Missing	Question number	Description	% Missing
F1	Who fills	0	F36	Net income -2010	8.55
F2.1	Birth month	0	F37	Control working -2010	0
F2.2	Birth year	0	F38	Type contract -2010	0.37
F3	Nationality	0	F39.1	Contract, month since -2010	0
F4.1	Month arrived	0.74	F39.2	Contract, year since -2010	0
F4.2	Year arrived	0.74	F40.1	Tenure, month since -2010	0
F5	Language home	0	F40.2	Tenure, year since -2010	0
F6	Education	0	F41	Sector firm -2010	4.46
F7.1	Education father	6.32	F42	Time at work -2010	6.69
F7.1	Education mother	8.18	F43	Size firm -2010	6.69
F8	Civil status	0	F44	Sector firm detailed -2010	5.95
F9.1	Month civil status	1.86	F45	Motivation at work -2010	7.81
F9.2	Year civil status	1.12	F46	Reason end -2010	1.86
F10	Previous civil status	0.74	F47	Duration temp contract -2010	2.6
F11	Belong to AMPA	2.97	F48.1	Month end temp contract -2010	2.6
F12.1	Ampa since month	2.97	F48.2	Year end temp contract -2010	2.6
F12.2	Ampa since year	3.72	F49.1	Got renewed -2010	1.49
F13	Decision	4.46	F49.2	Months more -2010	1.86
F14	Contract partner 12	4.46	F50.1	Knew extension, month -2010	2.6
F15	Contract partner 10	14.87	F50.2	Knew extension, year -2010	2.6
F16	Contract partner 08	14.87	F51	Control 2008	0.37
F17	Labour situation	0	F52	Labour situation -2008	0.37
F18.1	Not working, month	0	F53.1	Not working, month -2008	0.74
F18.2	Not working, year	0	F53.2	Not working, year -2008	0.37
F19	Net income	7.43	F54	Net income -2008	11.52
F20	Control working	0	F55	Control working -2008	0.37
F21	Type contract	0	F56	Type contract -2008	0.37
F22.1	Contract, month since	0.37	F57.1	Contract, month since -2008	0.37
F22.2	Contract, year since	0	F57.2	Contract, year since -2008	0.37
F23.1	Tenure, month since	0.37	F58.1	Tenure, month since -2008	0.37
F23.2	Tenure, year since	0	F58.2	Tenure, year since -2008	0.37
F24	Sector firm	2.97	F59	Sector firm -2008	4.83
F25	Time at work	4.83	F60	Time at work -2008	7.81
F26	Size firm	4.83	F61	Size firm -2008	6.69
F27	Sector firm detailed	4.09	F62	Sector firm detailed -2008	6.32
F28	Motivation at work	6.32	F63	Motivation at work -2008	8.55
F29	Duration temp contract	0.37	F64	Reason end -2008	2.23
F30.1	Month end temp contract	0.37	F65	Duration temp contract -2008	2.97
F30.2	Year end temp contract	0.37	F66.1	Month end temp contract -2008	2.97
F31	Expectation renovation	0.37	F66.2	Year end temp contract -2008	2.97
F32	Easy find a job	0.37	F67.1	Got renewed -2008	1.86
F33	Control 2010	0	F67.2	Months more -2008	2.6
F34	Labour situation -2010	0	F68.1	Knew extension, month -2008	4.46
F35.1	Not working, month -2010	0.37	F68.2	Knew extension, year -2008	4.46
F35.2	Not working, year -2010	0			

F stands for father's questionnaire. The percent missing is calculated over 269 answers. The difference between the number of answers in the household questionnaire and the father questionnaire is due to fathers not living in the same household as their offspring.

Table A3: **Item non response. Mother's questionnaire**

Question number	Description	% Missing	Question number	Description	% Missing
M1	Who fills	0	M36	Net income -2010	7.53
M2.1	Birth month	0	M37	Control working -2010	0
M2.2	Birth year	0	M38	Type contract -2010	0.34
M3	Nationality	0	M39.1	Contract, month since -2010	0.68
M4.1	Month arrived	0.68	M39.2	Contract, year since -2010	0.68
M4.2	Year arrived	0	M40.1	Tenure, month since -2010	1.03
M5	Language home	0	M40.2	Tenure, year since -2010	1.03
M6	Education	0.34	M41	Sector firm -2010	2.74
M7.1	Education father	8.56	M42	Time at work -2010	4.45
M7.1	Education mother	6.85	M43	Size firm -2010	3.42
M8	Civil status	0	M44	Sector firm detailed -2010	3.42
M9.1	Month civil status	1.71	M45	Motivation at work -2010	3.77
M9.2	Year civil status	1.03	M46	Reason end -2010	1.37
M10	Previous civil status	1.71	M47	Duration temp contract -2010	3.08
M11	Belong to AMPA	1.37	M48.1	Month end temp contract -2010	2.74
M12.1	Ampa since month	1.37	M48.2	Year end temp contract -2010	2.74
M12.2	Ampa since year	2.4	M49.1	Got renewed -2010	1.71
M13	Decision	5.14	M49.2	Months more -2010	2.74
M14	Contract partner 12	3.77	M50.1	Knew extension, month -2010	3.08
M15	Contract partner 10	14.38	M50.2	Knew extension, year -2010	3.08
M16	Contract partner 08	14.38	M51	Control 2008	1.03
M17	Labour situation	1.03	M52	Labour situation -2008	1.37
M18.1	Not working, month	2.4	M53.1	Not working, month -2008	2.05
M18.2	Not working, year	1.03	M53.2	Not working, year -2008	1.37
M19	Net income	8.9	M54	Net income -2008	11.64
M20	Control working	1.03	M55	Control working -2008	1.37
M21	Type contract	1.37	M56	Type contract -2008	1.71
M22.1	Contract, month since	0.68	M57.1	Contract, month since -2008	1.03
M22.2	Contract, year since	0.68	M57.2	Contract, year since -2008	1.03
M23.1	Tenure, month since	0.68	M58.1	Tenure, month since -2008	1.03
M23.2	Tenure, year since	0.68	M58.2	Tenure, year since -2008	1.03
M24	Sector firm	3.77	M59	Sector firm -2008	6.16
M25	Time at work	6.16	M60	Time at work -2008	8.56
M26	Size firm	4.79	M61	Size firm -2008	6.85
M27	Sector firm detailed	4.79	M62	Sector firm detailed -2008	6.85
M28	Motivation at work	5.48	M63	Motivation at work -2008	7.53
M29	Duration temp contract	2.74	M64	Reason end -2008	4.79
M30.1	Month end temp contract	2.4	M65	Duration temp contract -2008	5.48
M30.2	Year end temp contract	2.4	M66.1	Month end temp contract -2008	5.48
M31	Expectation renovation	2.74	M66.2	Year end temp contract -2008	5.48
M32	Easy find a job	2.4	M67.1	Got renewed -2008	3.08
M33	Control 2010	0	M67.2	Months more -2008	4.45
M34	Labour situation -2010	0	M68.1	Knew extension, month -2008	6.85
M35.1	Not working, month -2010	1.03	M68.2	Knew extension, year -2008	6.85
M35.2	Not working, year -2010	0			

M stands for mother's questionnaire. The percent missing is calculated over 292 answers.

Table A4: **Item non response. Final missings on net income variables**

Question number	Description	% Missing	Question number	Description	% Missing
F19	Net income	4.46	M19	Net income	3.42
F36	Net income -2010	7.06	M36	Net income -2010	2.74
F54	Net income -2008	10.04	M54	Net income -2008	5.48

F stands for father's questionnaire and M stands for mother's questionnaire. The percent missing is calculated over 269 answers for fathers and 292 answers for mothers.

CUESTIONARIO DE HOGAR

Instrucciones: 1. Cuando le pregunte por mes y año, si no lo recuerda bien, por favor dígame la fecha aproximada.

2. En las preguntas sobre sus hijos, incluya también a los hijos/as de su pareja.

3. Cuando las respuestas a una pregunta muestren varias opciones, marque con una cruz la opción que corresponda: [x]

¡Muchísimas gracias por su colaboración!

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1. ¿Quién rellena el cuestionario de hogar? Padre ☐ Madre ☐

2. Número de personas que VIVEN ACTUALMENTE en la vivienda familiar, incluyéndose usted: _____

3. ¿Cuántos hijos/as tiene? (incluya también los hijos/as de su pareja): _____

HIJOS ACTUALMENTE MATRICULADOS en el colegio (rellene un CUADRO por cada niño/a)

HIJO-1: Nombre: _____ **Apellidos**: _____

Fecha de nacimiento: Día: _____ Mes: ____ Año: ____ **Sexo**: Niño☐ Niña☐ **Curso**: _____

Se trata de su: (marque) Hijo/a ☐ Hijo/a de su pareja ☐→ En ese caso, **¿desde cuándo viven juntos?** Mes: ____ Año: ____

Para su pareja actual es su: Hijo/a ☐ Hijo/a de su pareja ☐→En ese caso, **¿desde cuándo viven juntos?** Mes: ____ Año: ____

HIJO-2: Nombre: _____ **Apellidos**: _____

Fecha de nacimiento: Día: _____ Mes: ____ Año: ____ **Sexo**: Niño☐ Niña☐ **Curso**: _____

Se trata de su: (marque) Hijo/a ☐ Hijo/a de su pareja ☐→ En ese caso, **¿desde cuándo viven juntos?** Mes: ____ Año: ____

Para su pareja actual es su: Hijo/a ☐ Hijo/a de su pareja ☐→En ese caso, **¿desde cuándo viven juntos?** Mes: ____ Año: ____

HIJO-3: Nombre: _____ **Apellidos**: _____

Fecha de nacimiento: Día: _____ Mes: ____ Año: ____ **Sexo**: Niño☐ Niña☐ **Curso**: _____

Se trata de su: (marque) Hijo/a ☐ Hijo/a de su pareja ☐→ En ese caso, **¿desde cuándo viven juntos?** Mes: ____ Año: ____

Para su pareja actual es su: Hijo/a ☐ Hijo/a de su pareja ☐→En ese caso, **¿desde cuándo viven juntos?** Mes: ____ Año: ____

HIJO-4: Nombre: _____ **Apellidos**: _____

Fecha de nacimiento: Día: _____ Mes: ____ Año: ____ **Sexo**: Niño☐ Niña☐ **Curso**: _____

Se trata de su: (marque) Hijo/a ☐ Hijo/a de su pareja ☐→ En ese caso, **¿desde cuándo viven juntos?** Mes: ____ Año: ____

Para su pareja actual es su: Hijo/a ☐ Hijo/a de su pareja ☐→En ese caso, **¿desde cuándo viven juntos?** Mes: ____ Año: ____

HIJOS NO MATRICULADOS ACTUALMENTE en el colegio (rellene una FILA por cada niño/a)

	Sexo		**Fecha nacimiento**	**¿Vive en el hogar?**		**Para usted,** se trata de su**:**		**Para su PAREJA actual,** es su:	
1	Niño☐	Niña☐	Mes:___ Año:___	Sí☐	No☐	Hijo/a☐	Hijo/a pareja☐	Hijo/a☐	Hijo/a pareja☐
2	Niño☐	Niña☐	Mes:___ Año:___	Sí☐	No☐	Hijo/a☐	Hijo/a pareja☐	Hijo/a☐	Hijo/a pareja☐
3	Niño☐	Niña☐	Mes:___ Año:___	Sí☐	No☐	Hijo/a☐	Hijo/a pareja☐	Hijo/a☐	Hijo/a pareja☐
4	Niño☐	Niña☐	Mes:___ Año:___	Sí☐	No☐	Hijo/a☐	Hijo/a pareja☐	Hijo/a☐	Hijo/a pareja☐

Información sobre su vivienda

4. ¿Su vivienda es? De propiedad, totalmente pagada ☐ De propiedad, con hipoteca ☐ Alquilada ☐ Cesión gratuita ☐

5. ¿En qué barrio vive? _____ **6. ¿Desde cuándo viven en esa vivienda?** Mes: ____ Año: ____

7. Usted y sus hijos, ¿han vivido SIEMPRE en la vivienda actual? Sí ☐ (Fin cuestionario hogar) No ☐ (siga contestando)

8. ¿Su vivienda ANTERIOR a la actual era? De propiedad ☐ Alquiler☐ Cesión gratuita ☐

9. Barrio de la vivienda **ANTERIOR a la actual**: _____

CUESTIONARIO INDIVIDUAL 1

Instrucciones: 1. Hay dos cuestionarios individuales. **Uno debe ser rellenado por el padre o padrastro y el otro por la madre o madrastra** de los hijos matriculados en el colegio, siempre que vivan en el mismo hogar.

2. **Cuando le pregunte por mes y año, si no lo recuerda bien, por favor dígame la fecha aproximada**.

3. Cuando las respuestas a una pregunta muestren varias opciones, marque con una cruz la opción que corresponda: [x]

4. Por razones técnicas, debo preguntarle sobre el tipo de contrato de su pareja, aunque su pareja conteste a esto en su cuestionario individual. Disculpe las molestias que esto le pueda ocasionar.

¡Muchísimas gracias por su colaboración!

---

1. ¿Quién rellena este cuestionario? Padre ☐ Madre ☐

Información personal

2. Fecha de nacimiento: Mes: _____ Año: _____

3. Nacionalidad: Española ☐ Extranjera ☐ → **4. Si es extranjera, ¿cuándo llegó a España?** Mes: ____ Año: ____

5. ¿Qué idioma se habla normalmente en casa? Español ☐ Catalán ☐ Otro ☐

6. ¿Cuál es su máximo nivel de estudios alcanzado? Marque la opción que contenga su máximo nivel de estudios alcanzado:

1. Sin estudios, o fue a la escuela menos de 5 años ☐
2. Primaria (fue a la escuela 5 años o más, pero no llegó al último curso del Bachillerato elemental, EGB o ESO) ☐
3. Llegó al último curso del Bachillerato Elemental, EGB o ESO, o tiene el Certificado de Escolaridad o Estudios Primarios ☐
4. FP-I, FP grado medio, oficialía industrial o equivalente, grado medio de música y danza ☐
5. Bachillerato superior, BUP, COU, Bachillerato (LOGSE, LOE) ☐
6. FP-II, FP grado superior, maestría industrial o equivalente ☐
7. Estudios superiores (Diplomatura universitaria, Licenciatura, Ingeniería técnica o superior, Máster, Doctorado) ☐
8. Otro ☐→Especifique: _____

7. ¿Cuál fue el máximo nivel de estudios alcanzado por su padre y por su madre? (elija una de las opciones de la lista anterior)

Padre: _____ Madre: _____

8. ¿Cuál es su estado civil actual? Soltero ☐ Pareja de hecho ☐ Casado ☐ Viudo ☐ Separado/divorciado ☐

9. ¿Desde cuándo es ese su estado civil? Mes: ____ Año: ____

10. ¿Cuál era su estado civil anterior al actual? Soltero ☐ Pareja de hecho ☐ Casado ☐ Viudo ☐ Separado/divorciado ☐

11. ¿Ha pertenecido alguna vez a la AMPA (asociación de madres y padres)? Sí ☐ (**siga contestando**) No ☐ (**pase a preg 13**)

12. ¿Me podría decir cuándo fue la primera vez que perteneció a la AMPA? Mes: _____ Año: _____

13. Una vez finalizada la **educación obligatoria** (4-ESO) de sus hijos: **¿quién tendrá la última palabra en la decisión de si siguen estudiando o no?** Marque UNA opción: Decidiremos los padres ☐ Decidirán los profesores ☐ Decidirán los propios hijos ☐

Información sobre el tipo de contrato de su pareja ACTUAL (rellene sólo si vive en el hogar con usted):

14. Tipo de contrato de su pareja actual AHORA:	Indefinido (fijo) ☐	Temporal ☐	No corresponde ☐
15. Tipo de contrato de su pareja actual hace 2 años:	Indefinido (fijo) ☐	Temporal ☐	No corresponde ☐
16. Tipo de contrato de su pareja actual hace 4 años:	Indefinido (fijo) ☐	Temporal ☐	No corresponde ☐

Instrucciones: A continuación, le preguntaré por SU **situación con respecto al mercado laboral en la actualidad**, después por su **situación laboral hace dos años**, y finalmente por su **situación laboral hace 4 años**. Siga las preguntas (y flechas) y verá que si su situación laboral ha sido la misma durante los últimos 4 años, sólo contestará a las preguntas relativas a su situación laboral actual.

Información sobre SU situación laboral ACTUAL:

17. **¿Cuál es su situación laboral actual**? (Si trabaja, y tiene dos empleos, marque la opción que corresponda a su **empleo principal)**

1. Empresario/a, autónomo/a, trabajador/a por cuenta propia ☐
2. Trabajador/a asalariado/a (también si no tiene contrato) ☐
3. Trabajador/a del hogar (trabaja en un hogar diferente al suyo) ☐
4. Ayuda en la empresa o negocio familiar ☐

5. Desempleado/a o en paro, y buscando trabajo ☐
6. Tareas del hogar (amo/a de casa) ☐
7. Jubilado/a, prejubilado, pensionista o con la invalidez ☐
8. Estudiante, sin trabajo ☐

→ **18**. **¿Desde cuándo?** Mes:_____ Año: _____

19. ¿Cuál es su **nivel de ingresos NETOS mensuales** en **€** (ya sea por su salario, subsidio de desempleo, pensión u otra ayuda)?

Menos de 999 € ☐ Entre 1000 y 1499 € ☐ Entre 1500 y 1999 € ☐ Más de 2000 € ☐ No corresponde ☐

20. **¿Es usted: empresario/a, autónomo/a, trabajador/a asalariado, trabajador/a del hogar, o ayuda en la empresa familiar?**

Sí ☐ (**siga contestando en la pregunta 21**)
No ☐ (**vaya a la pregunta 33 en la página siguiente**) →

21. **Tipo de contrato**: De duración indefinida (fijo) ☐ De duración temporal o eventual ☐ Sin contrato ☐
Régimen Especial trabajadores del hogar ☐ No corresponde (por ejemplo, para empresarios, autónomos, etc) ☐

22. **Fecha de inicio del contrato actual** (deje en blanco si no tiene contrato): Mes: _____ Año: _____

23. **¿Cuándo empezó a trabajar en la empresa actual?** Mes: _____ Año: _____

24. **Sector al que pertenece la empresa:** Sector privado ☐ Sector o administración pública ☐

25. **Jornada de trabajo**: A tiempo completo ☐ A tiempo parcial ☐

26. **Tamaño de la empresa** (número de trabajadores): Sólo yo ☐ De 2 a 9 ☐ De 10 a 49 ☐ De 50 a 249 ☐ Más de 250 ☐

27. **Sector de actividad de la empresa** (marque una sola opción)

Agricultura, ganadería, pesca ☐ Industria manufacturera, extractiva y suministros ☐ Construcción (incluye fontaneros, carpinteros, etc) ☐
Comercio ☐ Hostelería ☐ Limpieza ☐ Resto de actividades del sector servicios ☐ Otro ☐ → Indique: _____

28. **Grado de motivación en el trabajo** (marque una opción del 1 al 5, dónde 1 significa NADA motivado y 5 MUY motivado):

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

Conteste si USTED tiene un CONTRATO de duración TEMPORAL:

29. **Duración en meses** de su contrato actual: _____

30. **¿Cuándo finaliza su contrato actual**? Mes: _____ Año: _____

31. **¿**Sabe si van a **renovarle** al final de su contrato? Sabe que sí ☐ Cree que sí ☐ Cree que no ☐ Sabe que No ☐

32. **¿**Cree que será **fácil encontrar un trabajo** cuando se le acabe este contrato? (1 significa NADA fácil y 5 MUY fácil)

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

Información sobre su SITUACIÓN LABORAL hace 2 años (ENERO 2010)

33. **Hace 2 años (en enero de 2010), ¿se encontraba en la MISMA situación laboral que EN LA ACTUALIDAD?**

Sí, MISMA situación laboral **o** MISMO contrato que el que tengo ahora ☐ (**vaya a la pregunta 51, página siguiente**) →

No, DIFERENTE situación laboral **o** contrato DIFERENTE al que tengo ahora ☐ (**siga contestando en la pregunta 34**)

34. **¿Cuál era su situación laboral hace 2 años**? (Si trabajaba, y tenía dos empleos, responda con los datos de su **empleo principal)**

1. Empresario/a, autónomo/a, trabajador/a por cuenta propia ☐
2. Trabajador/a asalariado/a (también si no tiene contrato) ☐
3. Trabajador/a del hogar (trabaja en un hogar diferente al suyo) ☐
4. Ayuda en la empresa o negocio familiar ☐

5. Desempleado/a o en paro, y buscando trabajo ☐
6. Tareas del hogar (amo/a de casa) ☐
7. Jubilado/a, prejubilado, pensionista o con la invalidez ☐
8. Estudiante, sin trabajo ☐

→ **35**. **¿Desde cuándo?** Mes:_____ Año: _____

36. **Nivel de ingresos NETOS mensuales en € hace 2 años** (ya sea por su salario, subsidio de desempleo, pensión u otra ayuda):

Menos de 999 € ☐ Entre 1000 y 1499 € ☐ Entre 1500 y 1999 € ☐ Más de 2000 € ☐ No corresponde ☐

37. **Hace 2 años, ¿era usted** empresario/a, autónomo, trabajador asalariado, trabajador/a del hogar, o ayudaba en la empresa familiar?

Sí ☐ (**siga contestando en la pregunta 38 con la información del trabajo de ENERO de 2010**)

No ☐ (vaya a la pregunta 51 en la siguiente página) →

Todas las preguntas se refieren a ENERO de 2010 (hace 2 años)

38. **Tipo de contrato**: De duración indefinida (fijo) ☐ De duración temporal o eventual ☐ Sin contrato ☐
Régimen Especial trabajadores del hogar ☐ No corresponde (por ejemplo, para empresarios, autónomos, etc) ☐

39. **Fecha de inicio del contrato que tenía en enero de 2010** (deje en blanco si no tenía contrato): Mes: _____ Año: _____

40. **¿Cuándo empezó a trabajar en la empresa en la que trabajaba en enero de 2010**? Mes: _____ Año: _____

41. Sector al que pertenecía la empresa: Sector privado ☐ Sector o administración pública ☐

42. **Jornada de trabajo**: A tiempo completo ☐ A tiempo parcial ☐

43. **Tamaño de la empresa** (número de trabajadores): Sólo yo ☐ De 2 a 9 ☐ De 10 a 49 ☐ De 50 a 249 ☐ Más de 250 ☐

44. **Sector de actividad de la empresa** (marque una sola opción)

Agricultura, ganadería, pesca ☐ Industria manufacturera, extractiva y suministros ☐ Construcción (incluye fontaneros, carpinteros, etc) ☐
Comercio ☐ Hostelería ☐ Limpieza ☐ Resto de actividades del sector servicios ☐ Otro ☐ → Indique: _____

45. **Grado de motivación en el trabajo** (marque una opción del 1 al 5, dónde 1 significa NADA motivado y 5 MUY motivado):

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

46. **¿Cuáles fueron los motivos de que ésta no sea su situación laboral actual**?

Dejó el trabajo voluntariamente ☐ Fin del contrato temporal ☐ Fue despedido ☐
Reducción de plantilla ☐ La empresa cerró ☐ Otra razón ☐

Conteste si USTED tenía un CONTRATO de duración TEMPORAL en ENERO DE 2010

47. Duración en meses del contrato que tenía en enero de 2010: _____

48. **¿Cuándo finalizaba el contrato que tenía en enero de 2010**? Mes: _____ Año: _____

49. **¿Le renovaron el contrato en la misma empresa**? No ☐ Sí ☐ → **¿**Durante cuántos meses más? ___

50. **¿Cuándo supo si le renovaban o no el contrato**? Mes: _____ Año: _____

Información sobre su SITUACIÓN LABORAL hace 4 años (ENERO 2008)

51. Hace 4 años (enero 2008), ¿se encontraba en la MISMA situación laboral que EN LA ACTUALIDAD?

Sí, MISMA situación laboral **o** MISMO contrato que el que tengo ahora ☐ (**FIN DEL CUESTIONARIO**) ☺

No, pero MISMA situación laboral **o** MISMO contrato que tenía en ENERO de 2010 ☐ (**FIN DEL CUESTIONARIO**) ☺

No, DIFERENTE situación laboral **o** DIFERENTE contrato al que tenía en ENERO de 2010 ☐ (**siga contestando** en pregunta 52)

52. Cuál era su situación laboral hace 4 años? (Si trabajaba, y tenía dos empleos, responda con los datos de su **empleo principal)**

1. Empresario/a, autónomo/a, trabajador/a por cuenta propia ☐
2. Trabajador/a asalariado/a (también si no tiene contrato) ☐
3. Trabajador/a del hogar (trabaja en un hogar diferente al suyo) ☐
4. Ayuda en la empresa o negocio familiar ☐

5. Desempleado/a o en paro, y buscando trabajo ☐
6. Tareas del hogar (amo/a de casa) ☐
7. Jubilado/a, prejubilado, pensionista o con la invalidez ☐
8. Estudiante, sin trabajo ☐

→ **53. ¿Desde cuándo?** Mes:_____ Año: _____

54. Nivel de ingresos NETOS mensuales en € hace 4 años (ya sea por su salario, subsidio de desempleo, pensión u otra ayuda):

Menos de 999 € ☐ Entre 1000 y 1499 € ☐ Entre 1500 y 1999 € ☐ Más de 2000 € ☐ No corresponde ☐

55. Hace 4 años, ¿era usted empresario/a, autónomo, trabajador asalariado, trabajadora del hogar, o ayudaba en la empresa familiar?

Sí ☐ (**siga contestando en la pregunta 56 con la información del trabajo de ENERO de 2008**)

No ☐ (**FIN DEL CUESTIONARIO**)☺

Todas las preguntas se refieren a ENERO de 2008 (hace 4 años)

56. Tipo de contrato: De duración indefinida (fijo) ☐ De duración temporal o eventual ☐ Sin contrato ☐
Régimen Especial trabajadores del hogar ☐ No corresponde (por ejemplo, para empresarios, autónomos, etc) ☐

57. Fecha de inicio del contrato que tenía en enero de 2008 (deje en blanco si no tenía contrato): Mes: _____ Año: _____

58. ¿Cuándo empezó a trabajar en la empresa en la que trabajaba en enero de 2008? Mes: _____ Año: _____

59. Sector al que pertenecía la empresa: Sector privado ☐ Sector o administración pública ☐

60. Jornada de trabajo: A tiempo completo ☐ A tiempo parcial ☐

61. Tamaño de la empresa (número de trabajadores): Sólo yo ☐ De 2 a 9 ☐ De 10 a 49 ☐ De 50 a 249 ☐ Más de 250 ☐

62. Sector de actividad de la empresa (marque una sola opción)

Agricultura, ganadería, pesca ☐ Industria manufacturera, extractiva y suministros ☐ Construcción (incluye fontaneros, carpinteros, etc) ☐
Comercio ☐ Hostelería ☐ Limpieza ☐ Resto de actividades del sector servicios ☐ Otro ☐ → Indique: _____

63. Grado de motivación en el trabajo (marque una opción del 1 al 5, dónde 1 significa NADA motivado y 5 MUY motivado):

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

64. ¿Cuáles fueron los motivos de que ésta no fuese su situación laboral 2 años después (en enero de 2010)?

Dejó el trabajo voluntariamente ☐ Fin del contrato temporal ☐ Fue despedido ☐
Reducción de plantilla ☐ La empresa cerró ☐ Otra razón ☐

Conteste si USTED tenía un CONTRATO de duración TEMPORAL en ENERO DE 2008

65. Duración en meses del contrato que tenía en enero de 2008: _____

66. ¿Cuándo finalizaba el contrato que tenía en enero de 2008? Mes: _____ Año: _____

67. ¿Le renovaron el contrato en la misma empresa? No ☐ Sí ☐ → **¿**Durante cuántos meses más? ___

68. ¿Cuándo supo si le renovaban o no el contrato? Mes: _____ Año: _____ (**FIN DEL CUESTIONARIO**)☺

Chapter 2

Job Loss at Home: Children's Grades during the Great Recession in Spain

2.1 Introduction

The available evidence on the effects of job loss indicates that job loss has negative effects for the affected worker. According to the literature, among these negative consequences we can find short-run earning losses that persist in the long-rung (Jacobson et al., 1993), lower re-employment probabilities (Kletzer, 1998; Huttunen et al., 2011), prevalent feelings of job insecurity (Barling et al., 1999b), worse physical and mental health (Eliason and Storrie, 2009b,a), an excess risk of divorce (Eliason, 2012; Charles and Stephens, 2004) and, upon re-employment, a moderate increase in workplace injuries (Leombruni et al., 2013). A recent and rapidly growing literature has addressed the question of whether parental job loss has detrimental effects on their offspring. The majority of these papers show a negative effect of parental job loss on different educational outcomes. This chapter studies the impact of father's job loss on children's school performance during the Great Recession in Spain.

According to the evidence mentioned above, parents experiencing job loss suffer from income reduction, job uncertainty and a worse family environment, among other negative consequences. All these variables are usually seen as inputs affecting the grade production function of their children and could, therefore, be suggested as mechanisms through which parental job loss would translate into a worse school performance for those affected students.[1] On the other hand, students whose parents face an episode of job loss might change their beliefs on the relationship between effort and success. And this, in turn, might change their tastes for effort exerted while at school. In this case, though, empirical evidence on the direction of the distortion introduced by parental job loss does not seem to be as clear. Evidence coming from the social psychology field suggests that children whose parents suffer job loss develop negative work beliefs (Barling et al., 1998). Moreover, Giuliano and Spilimbergo (2009) find that those individuals that experienced an economic recession during their teenager years are more inclined to believe that luck, rather than effort, is the fundamental driver of success. However, there is also evidence that would suggest a positive impact on the tastes for effort. For instance, Betts and McFarland (1995) show that children choose more education when the labour market is weak.

[1] See Todd and Wolpin (2003) for a review on the specification and estimation of the production function for cognitive achievement.

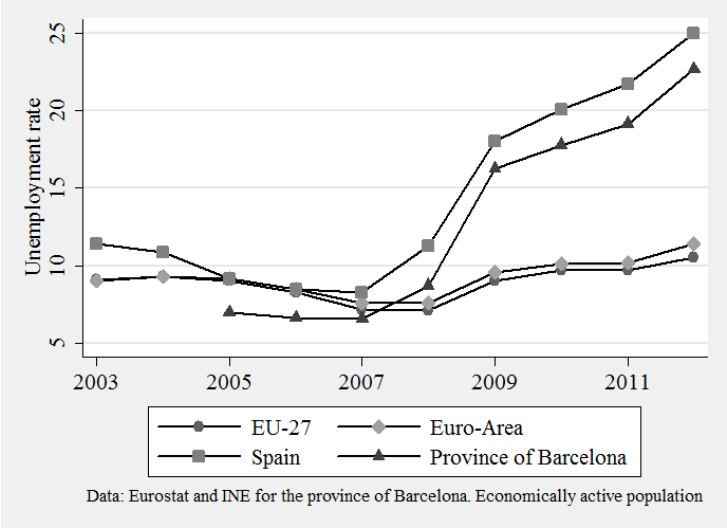
In a simple one period static model in which children decide the level of effort they exert at school each academic year, and effort positively influences school performance, parental job loss is assumed to affect both the marginal returns and marginal costs of effort, by making children more or less productive while studying, and altering their incentives to study. This simple model shows that from a theoretical point of view, the direction of the impact of parental job loss on grades is ambiguous. The data collected and the estimation strategy followed in this chapter will allow me to estimate the total effect of an arguably exogenous change in parental job loss on the school performance of their offspring. That is, not holding other inputs constant.

Estimating a causal relationship between parental job loss and child outcomes faces two main challenges: finding a source of exogenous variation for parental job loss and the scarcity of appropriate data. This chapter addresses both of them by exploiting the developments in the Spanish labour market during the Great Recession and by using a dataset specifically designed to address this question. In particular, this article uses an original dataset I gathered myself on the school performance of over 400 children aged 3 to 18 for the academic years 2007-2008 to 2011-2012 in a school in the province of Barcelona. On the parental side, I designed a survey to collect data retrospectively, with a special focus on the labour situation and job characteristics at the beginning of the crisis, i.e. in January 2008, and then later on in January 2010 and January 2012.

Starting from 2008, millions of jobs have been destroyed in Spain.[2] Figure 1 shows the unemployment rates in the EU-27, euro area, Spain and the province of Barcelona for the economically active population. Both the Spanish unemployment rate and the unemployment rate in the province of Barcelona reached its minimum in 2007, and started increasing dramatically thereafter (unemployment rates in Spain and the province of Barcelona were 25% and 22.6%, respectively, in 2012). The same pattern is found if I would restrict the data to males aged 25 to 74. Under the assumption that the vast majority of employment destruction observed in this period is due to the Great Recession (i.e., workers would not have lost their jobs otherwise), job losses could be considered as exogenous to the worker. Or as Gregg et al. (2012) put it, the recession provides an exogenous shock to employment analogous to exploring job displacement for known plant closures. However, it could be that those losing their jobs during the Great Recession in Spain have some unobserved characteristics that affect both their labour status and the school performance of their children. In order to address this last challenge, the panel nature of the data collected allows to condition for unobserved characteristics of both the student and the father by using student (worker) fixed effects. Thus, the empirical strategy followed in this article relies on the assumption that, conditioning on student fixed effects and observed covariates, the Great Recession in Spain generates exogenous variation in job loss analogous to

[2]According to the Labour Force Survey data provided by the Spanish National Institute of Statistics (INE) almost 4 million jobs were destroyed between 2007 and 2012.

Figure 1: Unemployment rates



that provided by randomisation.

Fixed effect estimates of the effect of father's job loss on the average grade and the percentile rank (in the cohort of the student) are negative and statistically significant. In particular, the results suggest that after father's job loss, the school performance of affected students is significantly worse. Paternal job loss entails a (yearly) average decrease in children's grades of around 13.2 to 16% of the population standard deviation, and a reduction of around 15.7 to 19.6% of the population standard deviation in the percentile rank measure, and these results remain unaltered once maternal job loss is accounted for in the empirical model. Importantly, in terms of being able to give a causal interpretation to the estimates, placebo tests show that both the percentile rank and the average grade prior to father's job loss are not affected by future job losses experienced by the father. Additionally, the negative effect of FJL does not seem to be driven by those students whose fathers had lower tenure at the firm prior to job loss, but rather, by those fathers that had a more stable situation prior to losing the job. This evidence would suggest that treated students were not on a different (negative) trend prior to father's job loss. Moreover, the results suggest that the negative impact of father's job loss in school performance is mainly driven by those fathers that suffer longer unemployment spells. Importantly, these results are pointing out a mechanism through which further inequalities might develop during and after a deep economic crisis. In this respect, the effect of father's job loss appears to be largely concentrated among children of already disadvantaged families in terms of the level of education of the father. This result doesn't seem to be fully explained by different income losses, and it can partly be explained by a higher probability of finding a job after job loss, for those

fathers with a high level of education. Also, even though imprecise, the results seem to be larger for those children whose fathers closed their own business after 2008, and more concentrated on boys rather than on girls. Even if in the whole sample father's job loss is associated with a significant decrease in income, these differential effects do not seem to be driven by changes in income. Thus, I find no clear evidence supporting the hypothesis that income could be the main mechanism behind the effect of father's job loss on school performance. I also find that residential relocation or changes in civil status are not the main drivers of the effect of father's job loss on school performance of their offspring.

This chapter is closely related to a recent emerging literature trying to assess the effects of parental job loss on several children outcomes. The first published articles focused on the effects of parental job displacements on their children's earnings later in life. Oreopoulos et al. (2008) use Canadian administrative data to find that children whose fathers were displaced had annual earnings about 9% lower than similar children whose fathers did not experience an employment shock, and that these estimates are driven by those children at the bottom of the income distribution. On the contrary, using data from Norway, Bratberg et al. (2008) find that displacement has negative effects on earnings of affected workers, but find no statistically significant effect of father's displacement on the earnings of their children. Additionally, parental job loss has also been related to worse infant health. Using data from the Panel Study of Income Dynamics, Lindo (2011) compares the birth weight of children born after and before a displacement, and finds that husband's job losses have significant negative effects on birth weights, that are concentrated on the lower half of the birth weight distribution.

More evidence is found on the recent literature analysing the impact of parental job loss on different educational outcomes. Using administrative Norwegian data, Rege et al. (2011) estimate the effect of parental job loss due to plant closure on a summary measure of ten subjects for a pooled cross-section of graduating secondary school children.[3] Their estimates suggest that paternal job loss has a negative impact of a 6% of the standard deviation on children's GPA at age sixteen, whereas they find a non-significant increase in GPA associated with maternal job loss. Stevens and Schaller (2011) use SIPP data to study the relationship between parental job loss (they focus on the father unless the child lives in a single-mother household) and grade retention between ages 5 to 19. Their findings indicate that the probability of children's grade retention increases by 15% after conditioning on child fixed effects. Their measure of job loss considers those that are classified as being fired, employer sold or went bankrupt, and due to slack work or business conditions. This contribution improves upon Kalil and Ziol-Guest (2008), which use the same data to explain grade retention, but concerns were raised on the exogeneity

[3]It is common to assume in the literature that job losses due to plant closures are exogenous to the affected workers.

of the measure used to capture parental job losses. Coelli (2011) finds that parental job loss from layoffs and business failures that occur when youth complete high school are found to be negatively related with enrollment at university and community college in Canada. A related study in this literature by Ananat et al. (2011), uses state-level US data on mass layoffs to show that job losses decrease test scores for math and reading assessments, and these effects are larger for eighth than fourth graders. Gregg et al. (2012) do not have information on job displacement for the worker itself and instead, the authors try to identify those parents being displaced by the contractions in employment suffered by the industry in which the father was working during the recession of the 1980's in the UK. They find that a child with a likely displaced father obtained lower grades, equivalent to about 2% lower wages as an adult, had a lower early labour market attachment, and no direct impact on earnings at age 30/34. Finally, instead of focusing on job losses, Pinger (2013) investigates how paternal unemployment affects children's educational attainment. She finds that paternal unemployment decreases the probability of upper secondary schooling choice by around 18 percentage points.

The contributions of this chapter to this literature are threefold. First, I use an original dataset specifically designed to address the research question. Second, the combination of job losses due to the Great Recession in Spain, together with the use of fixed effects given the panel nature of the data, make my measure of job loss more likely to fulfill the exogeneity assumption than most of the papers in the literature. Most of the cited papers use plant closures to identify the causal impact of father's job loss on their offspring's school outcomes, but can't control for student fixed effects as this chapter does. Finally, a variety of heterogeneous effects and mechanisms not explored before are identified. Additionally, analysing the Spanish case during the Great Recession is interesting given that the results might be pointing out a mechanism (paternal job loss) through which further inequalities might be developing during and after a deep economic crisis. Similar results could potentially be found in other economies that have been highly affected by the Great Recession in terms of employment losses, like Greece or Portugal.[4]

The structure of the chapter is as follows. Section 2.2 describes a simple theoretical framework describing the effects of parental job loss on children's optimal effort while at school. Section 2.3 describes the original dataset used in the chapter, and Section 2.4 presents the estimation strategy. Finally, Section 2.5 shows the main results and Section 2.6 concludes.

[4]These countries also have similar unemployment insurance gross replacement rates (although net replacement rates are higher in Portugal and Greece than in Spain). In terms of unemployment duration, the Spanish benefits last longer than those in place in these other two countries. For more data on this and comparisons with the rest of EU member states, see Esser et al. (2013).

2.2 The impact of parental job loss on grades. A simple theoretical framework

Consider a student in general education that every year has to choose how much effort to devote to study, e, and assume that her utility while she is in school depends directly and positively on the grades she obtains, G. In general, it's not unreasonable to think that better grades can entail a greater reward than bad grades either in the family environment (parents offering extra consumption for better grades) or later on in life by granting access to higher education, a wider choice of studies or a better job. The grade production function is determined by the level of effort supplied by the student: $G = g(e)$ and is supposed to be strictly increasing and concave in the level of effort. The effort that students devote to study entails a disutility, $d(e)$, which is supposed to be strictly increasing and convex. Thus, under this framework, the problem of the student is very similar to a static labour supply model, but here the student chooses the level of effort to maximise her utility:

$$\max_{e} \; U(G, e) = G - d(e) \tag{2.1}$$

Subject to the grade production function:

$$G = g(e) \tag{2.2}$$

The first order condition for an interior solution is given by (3) and states that students will choose the level of effort that equates the marginal rate of return to effort with its marginal cost:

$$g'(e) = d'(e) \tag{2.3}$$

Under this formulation there is only one level of effort that is optimal. A simple way of introducing heterogeneity in this setting is to follow Card (1999). Card introduces heterogeneity in the Becker (1967)'s optimal schooling choice model by introducing differences in the costs of (or tastes for) schooling, and in the economic benefits of schooling. Likewise, I will assume that the marginal rate of return to effort, $g'(e)$, and the marginal cost of effort, $d'(e)$, are linear functions with person-specific intercepts and homogeneous slopes:

$$g'(e) = \beta_i(e) = b_i - k_1 e \tag{2.4}$$

$$d'(e) = \delta_i = r_i + k_2 e \tag{2.5}$$

$$k_1 \geq 0, k_2 \geq 0 \tag{2.6}$$

As Card (1999) states, variation in b_i can be seen as differences in ability (for the same level of effort, more able people obtain higher grades). But he also points out that changes in school quality could be parameterised in this model by shifts in b_i. At the same time, variations in b_i could also reflect differences in family background, or, in general, those inputs traditionally seen as affecting the production function for cognitive achievement (see Todd and Wolpin (2003)). Variation in r_i can be seen as different tastes for effort.

Parental job loss could potentially affect both the marginal benefits and costs of effort. As stated in the introduction, people experiencing job loss suffer from income reduction, worse family environment, deteriorated physical and mental health, etc. That is, empirical evidence has until now shown a negative impact on the inputs that generally are seen as affecting the production function for cognitive achievement. But it could also be that children benefit from parents being more at home after job loss. Todd and Wolpin (2003) point out the lack of consensus of maternal employment on school achievement, for instance.

Parental job loss could also distort the tastes for effort of the affected student. However, the direction of the distortion could go, a priori, in any direction. Giuliano and Spilimbergo (2009) find that a recession during impressionable years (between 18 and 25 years of age) makes an individual more inclined to believe that luck, rather than effort, is the fundamental driver of success. Moreover, research in social psychology suggests that from as young as 5 years of age, children understand such concepts as pay, labour disputes, unemployment and welfare. (Barling et al., 1999b). Barling et al. (1999a) find that children's perceptions of their parent's job insecurity indirectly affect their grade performance through the effects of beliefs in an unjust world and negative mood. Similarly, Barling et al. (1998) postulate a model by which children who watch their parents experiencing layoffs and insecurity, develop negative work beliefs that then predict their work-related attitudes. According to these studies, parental job loss would introduce a negative distortion in the tastes for effort. On the contrary, it might be that students whose parents face job loss are more aware of the importance of education later in life, and thus receive an additional incentive to exert a higher level of effort that would lead to a better performance while at school. In this sense, the empirical evidence shows that, in general, children choose more education when the labour market is weak (see, for instance, Betts and McFarland (1995)). In this case, parental job loss would introduce a positive distortion in the tastes for effort.[5]

Therefore, both b_i and r_i could potentially be affected by parental job loss, and I will express this by writing both of them as a function of parental job loss (JL): $b(JL)_i$ and $r(JL)_i$,

[5]It seems reasonable to think that if this positive distortion exists, it would be bigger the older the student is.

respectively. Optimal level efforts are then determined according to:[6]

$$e_i^* = \frac{b(JL)_i - r(JL)_i}{k_1 + k_2} \tag{2.7}$$

Thus, the direction of the impact of parental job loss on effort (and therefore on grades) depends on the impacts of parental job loss on both the marginal returns and costs of effort and these are, as mentioned above, theoretically ambiguous.[7] This chapter will therefore assess the impact of parental job loss on grades from an empirical point of view. Given that the estimation strategy relies on the use of something close to a natural experiment, I will not be able to identify any of the parameters of the grade production function or the disutility of effort. Instead, what I will uncover is a policy effect, i.e. the total effect of an exogenous change in parental job loss on grades (that is, not holding other inputs constant). I will come back to this point in Section 2.4, after describing the dataset in the next section.

2.3 Data

The data used in this chapter come from an original dataset I collected myself, gathering data on the parental labour market situation and grades of 408 students with ages ranging from 3 to 18 in a school in the province of Barcelona.[8] In particular, for each of these students, I observe their grades in the different subjects from the academic year 2007-2008 to the academic year 2011-2012 (as long as they have been enrolled in the school since the academic year 2008).[9] On the parental side, I designed a survey to collect personal information as well as current and past information of their labour market situation and, if parents were employed, the characteristics of the job. The survey was supposed to be answered by both parents if they were living in the same household as the children. If only one parent was living at home at the time the survey was administered, then the survey was answered only by that parent. Regarding the information on the labour market characteristics of the parents, I collected information on their labour market situation (and if employed, on the job characteristics) in January 2012, January 2010 and January 2008. With the information of these 3 points in time, and the dates regarding labour status changes, I have reconstructed their labour market situation for the 5 periods in which I also observe the grades of their offspring.[10]

[6] Where a necessary condition for the equilibrium to exist with non-negative levels of effort is that $b_i \geq r_i$.

[7] Even if not included here, it might as well be that parental job loss affects the slopes (k_1, k_2) of the marginal return and marginal costs of effort. In any case, the effect would still be theoretically ambiguous.

[8] For a more detailed description of the questionnaire design, data collection, survey and item non response, and representativeness of the data, see Chapter 1.

[9] The academic year in Spain starts in September and finishes by the end of June, with summer holidays in the months of July and August. From now on, when I refer to, for instance, the academic year 2008, I will be referring to the academic year going from September 2007 to June 2008.

[10] Due to missing data for some individuals, I had to make some reasonable assumptions regarding the dates of job loss. Even if I am able to use the 5 years of information by making these assumptions, they could be

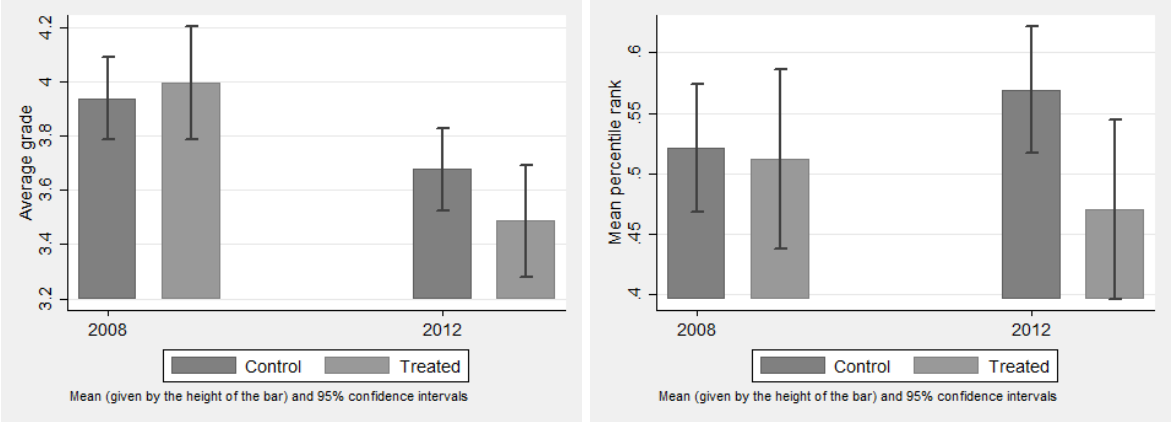
Following the related literature, a number of exclusion criteria are applied to create the final sample. First, those kids that are not living in 2012 in a two-parent household are dropped from the analysis (30 observations dropped). In all these cases the student is living only with the mother, and therefore, I have no information on the labour characteristics of the father. Second, given that the sample does not seem to be representative of students with an immigrant background (see Chapter 1), students whose fathers are immigrants are excluded (22 additional observations dropped). Third, given that students in the High-School stage ("Bachillerato") have already made the transition from compulsory to post-compulsory education and, as a result, I can only observe those that decided on continuing their studies, I am not considering them in the analysis (45 additional observations dropped). The final two exclusion criteria are important for the identification strategy and internal validity. I restrict the sample to those students that I can observe for each of the 5 periods. In practical terms, these means that I keep the observations for which I can observe the grades at the beginning of the crisis (academic year 2008), and for every year after that. A total of 128 students are excluded after applying this restriction. Out of them, 82 students are excluded because they were too young to be in school in the academic year 2007-2008 (children that in the academic year 2012 were in the second stage of kindergarten and those in the first grade of primary school).[11] The remaining 46 students that are not observed for 5 years are those that entered the school during secondary education. That is, they graduated from Primary school in another school, and enrolled in the school where the data was collected once they moved to secondary education. If data was available at the school where I collected the data also for grades in previous schools, then this information was incorporated in the dataset. Finally, the last and very important exclusion restriction has to do with the employment status of fathers in the first period of observation. I restrict the sample to those students whose fathers were employed in January 2008. After applying this restriction, 5 additional observations are dropped. Thus, the final sample consists of 178 students in compulsory education whose grades were observed for all the 5 academic years from 2008 to 2012 and whose fathers were employed at the beginning of the crisis in 2008, were present at home during all the period and had Spanish nationality. Robustness checks will be conducted by showing the results for the whole sample and results when removing some of this exclusion criteria.

Information on the grades obtained each academic year was made available by the school

introducing some measurement error in the dates regarding labour status changes. Thus, even if the main results shown both in this and the results section use this 5 period reconstructed dataset, I perform robustness checks using only the 3 years (2008, 2010 and 2012), for which information regarding the labour status is certain and there is no need to make any assumptions.

[11] See Chapter 1 for a description of the Spanish education system. Kindergarten in this chapter is based on the British/Australian definition (rather than the definition used in North America) and it refers to the stage of education where children below the age of compulsory education play and learn; a nursery school.

Figure 2: Average grade and mean percentile rank in the year-grade



for those students whose parents answered the questionnaire. The format of the grades for each stage of education is described in the section on data on school outcomes in Chapter 1. After some transformations to homogenise grades between stages of education, all the students in the sample have grades ranging from 1 to 5 (where 1 means that the student has failed to pass the subject, and 5 is the best possible grade). For each student I computed her average grade in each academic year by averaging her grades for all the subjects taken in each of the 3 terms in the academic year. For those students that in the period under study were enrolled in some of the Kindergarten grades, two possible average grades were available depending on the way I calculated their numeric kindergarten grade (see Chapter 1 for details. Throughout this chapter I use Measure 1, although I also conduct robustness checks using Measure 2). In order to have a measure that is less sensitive to the type of measure used and given that these grades are the result of non-standardised tests, I compute the percentile rank in the grade and year corresponding to each student. Both the average grade and the percentile rank will be used as dependent variables throughout the analysis.

I use the 5 period dataset to construct the treatment group. The treatment group consists of children whose fathers experienced an involuntary job loss (this includes those fathers closing their own business) at some point after the first academic year. In total, 54 out of the 178 children have been affected by father's job loss after academic year 2008.

Figure 2 shows the average grade and percentile rank for treated and control students in the academic years 2008 and 2012. In the academic year 2008, when all fathers in the sample were employed, there were no significant differences between treated and control students for none of the educational measures shown in the graph. In 2012 though, after some students have been

exposed to father's job loss, relevant differences emerge. For the average grade measure, standard errors are too big to reject the null hypothesis of a t-test of equality of means (not shown) between treated and control students in 2012. For the percentile rank measure, though, I do reject the null of equality of means between treated and control students in 2012. Tables A1, A2 and A3 show descriptive statistics for the sample of 178 students analysed. In each table, the first three columns report means of different variables. The last column reports the difference in the mean for control and treated individuals (first row), whereas the second row shows the value of a t-test that has as a null hypothesis the equality of means between control and treated students.

No significant differences emerge for the variables shown in Table A1, except for the third quarter of birth dummy. Compared to control students, there were more treated students born in the third quarter of the year. There are no significant differences in the means for those variables containing information on the sex, age, if ever repeated a grade, and if the grades referred to periods in school (as opposed to grades from previous schools). Descriptive statistics of household characteristics in 2008, previous to job loss, are shown in Table A2. Families of treated students were living more in rented apartments (as opposed to owing, with or without mortgage, an apartment), and there were no treated students living in the first postcode area.[12] More significant differences emerge in Table A3, where several personal and 2008 labour market descriptive statistics of fathers in the sample are shown. In this table, some of the variables have some missing information, so the number of observations available is shown in an additional (third) row.[13] The fathers of treated students had a lower level of income already in 2008, and a higher fraction was working in the industry and construction sectors.[14] Treated fathers had less years of tenure at the firm (defined for those owning her own business as the number of years since they opened the business), and a lower share of permanent contracts. None of the fathers of treated students worked in the public sector and, on average, they were employed on, or owned, smaller firms. Contrary to what it could be expected, there are no significant differences in the level of education of the fathers of treated and control students. It is also interesting to note that there were no significant differences in their level of motivation at work in 2008.

[12]This postcode area corresponds to the city center. Unfortunately, I do not have data on the level of income by postcodes, but according to census data, it is the area with the highest share of population born in Catalonia.

[13]In most of the cases, it was easy to detect that the information was missing because the father did not reply, by mistake, to one of the parts of the questionnaire. As a way to partially asses if these missing observations are related to father's job loss, I include a dummy in the table that is equal to 1 if income is missing. As it appears, there are no significant differences in the level of missing income between both treated and control students.

[14]High income is a variable derived from the following survey question: NET monthly income in euros (includes your salary, unemployment benefits, pension, or other subsidies). Possible answers are (1) less than 999 euros, (2) Between 1000 and 1499 euros, (3) Between 1500 and 1999 euros, and (4) More than 2000 euros. The father is classified as having a high income in 2008 if he marked options (3) or (4). See Chapter 1 for additional information on survey questions.

The information in Tables A1 to A3 suggests that, without controlling for worker fixed effects, job loss during the Great Recession in Spain can not be considered as good as randomly assigned.

2.4 Estimation strategy

Let Y_{it} equal the educational outcome under study for child i at time t.[15] This education indicator could either be her average grade in academic year t or the percentile rank of the student in her grade-year combination based on her average grade. Let D_{it} denote a dummy variable that equals 1 from the year the father loses involuntarily his job.[16] By the sample restrictions outlined in Section 2.3, this indicator equals 0 in the academic year 2008 for all students, since all fathers in the final sample are employed at the beginning of the Great Recession. For control students, this dummy will take a value of 0 in every period. For treated students, it will be 1 from the year the father loses the job. That is, the treatment is an absorbing state. The main reason to define the job loss variable in such a way is that, under certain assumptions, father's job loss in my sample can be considered exogenous to the worker whereas finding a job afterwards can not. The main assumption in the chapter, i.e. that conditioning on worker fixed effects the Great Recession generates random employment shocks, can not be used to analyse the effect of getting back to employment after job loss. The combination of fixed effects and the Great Recession can only explain random entry into job loss. After job loss I can not account, among other things, for the level of job search effort devoted by each worker in each period after job loss.[17]

The observed educational outcome, Y_{it}, is either Y_{0it} or Y_{1it}, depending on the father's job loss status. The main assumption behind the estimation strategy in this chapter is that conditioning on student fixed effects and observed covariates, the Great Recession in Spain generates employment shocks that are random in their timing. This assumption hides one potential risk for the consistency of my estimates, since I can not rule out the fact that unobserved time variant variables might be affecting at the same time the probability of job loss of parents and the grades of their offspring. In this sense, a major concern for my estimation strategy is given by the fact that fathers who lost the job during the period under analysis could have been on a different trajectory on the labour market prior to 2008. Unfortunately, pre-2008 labour

[15] This section follows the notation used by Angrist and Pischke (2008).

[16] Stevens and Schaller (2011) also define like this the measure of parental job loss. But given that their outcome of study is grade repetition, the year of parental job loss is separated from the dummies of job loss in prior years. In their case, job loss in the academic year, if exogenous, should not have an effect on whether the child is repeating that grade.

[17] I will explore in Section 2.5.1, though, the results using alternative treatment definitions (i.e., allowing the treatment variable to switch back to 0 once the worker finds a job after job loss).

market and school performance data to test for differential trends between treated and control students is not available.[18] A way to partially address this issue is to check whether the effects of FJL are mainly driven by those students whose fathers had been working for a short time in the firm previous to job loss, indicating that these fathers could have been on a different (negative) trajectory prior to losing the job during the Great Recession. As I will show in Section 2.5.1, this does not seem to be the case in my sample.[19] If the main assumption holds, then omitted time variant variables would not be a cause of concern in this chapter. As a result, father's job loss in this sample could be considered as good as randomly assigned after conditioning on student fixed effects and observed covariates:

$$E[Y_{0it}|A_i, X_{it}, X_i, t, D_{it}] = E[Y_{0it}|A_i, X_{it}, X_i, t] \tag{2.8}$$

where X_{it} is a vector of observed time varying covariates not affected by the job loss itself (like the stage of education the student is enrolled in); X_i is a vector of observed time invariant covariates (like sex, level of education of the father, permanent wealth, etc.), and A_i is a vector of unobserved but fixed confounders capturing, among others, the unobserved ability of the student. As Angrist and Pischke (2008) point out and I discussed above, the key to fixed effects estimation is therefore the assumption that the unobserved A_i appears without a time subscript in a linear model for $E[Y_{0it}|A_i, X_{it}, X_i, t]$:

$$E[Y_{0it}|A_i, X_{it}, X_i, t] = \alpha + \lambda_t + A_i'\gamma + X_i'\phi + X_{it}'\beta \tag{2.9}$$

Assuming that the causal effect of father's job loss is additive and constant, then:

$$E[Y_{1it}|A_i, X_{it}, X_i, t] = E[Y_{0it}|A_i, X_{it}, X_i, t] + \rho \tag{2.10}$$

which together with equation 9 implies:

$$\begin{aligned} &E[Y_{it}|A_i, X_{it}, X_i, t] = D_{it} * (E[Y_{0it}|A_i, X_{it}, X_i, t] + \rho) + (1 - D_{it}) * E[Y_{0it}|A_i, X_{it}, X_i, t] \\ &= \alpha + \lambda_t + \rho D_{it} + A_i'\gamma + X_i'\phi + X_{it}'\beta \end{aligned} \tag{2.11}$$

where ρ captures the after job loss average causal effect on children's school performance as long as the assumption of absence of time invariant omitted variables holds. Using the panel

[18] However, it is important to note that the fixed effect controls for static pre-2008 labour market experience (i.e., number of years in unemployment prior to the Great Recession).

[19] Additionally, the main characteristics of workers that lost their jobs in the first period of the crisis (2009-2010), and those that lost their jobs in the second period (2011-2012) are not significantly different from each other. That is, it seems that the Great Recession was not affecting a particular type of workers at the beginning of the employment destruction process as compared to workers losing the job a couple years after the start of the Great Recession (see Table A4).

nature of the data available, I can therefore estimate the following fixed effects model:

$$Y_{it} = \alpha_i + \lambda_t + \rho D_{it} + X'_{it}\beta + \epsilon_{it} \tag{2.12}$$

$$\alpha_i = \alpha + A'_i\gamma + X'_i\phi \tag{2.13}$$

where the individual fixed effect, α_i would capture any time invariant characteristic affecting the educational outcomes of the child, both at the child, household and father/mother level; and λ_t represents a vector of year dummies. Since those factors that may change as a result of job loss are omitted from the specification (changes in income, civil status, etc.), ρ captures the (average) full effect of father's job loss on school performance every year after job loss. That is, it captures the total effect of an exogenous negative change in the labour status (father's job loss) on the educational outcomes of their offspring, not holding other inputs constant. As Todd and Wolpin (2003) would put it, in this chapter there is no attempt to incorporate in the model all the determinants of cognitive achievement. Instead, this chapter makes use of an event that arguably provides a source of exogenous variation (the Great Recession), once worker's fixed effects are accounted for. Additionally, as Imbens and Angrist (1994) put it, in models with panel data and fixed effects, the data are only informative about the impact of binary regressors on individuals for whom the value of the regressor changes over the period of observation. In this sense, the estimates in this chapter, rather than identifying average population effects, could be seen as measuring a local average treatment effect (LATE), i.e., the effect of father's job loss for those students whose fathers lost the job due to the Great Recession. As seen in the descriptive statistics tables in Section 2.3, fathers who lost the job were all employed in the private sector, and proportionately more in the industry and construction sector. As other studies identifying local average treatment effects, this study could be subject to the critique of whether the effect of job loss for those students whose fathers lost the job during the Great Recession in Spain is an effect of interest.[20] Given the dimensions of the Great Recession in terms of job loss, the answer to this question doesn't seem unimportant. On the contrary, the results in this chapter will shed some light on how a deep economic recession severely affecting some sectors in the economy impacts the educational outcomes of students whose fathers are hit hard by the recession.

As seen in the graphs in the previous section, future father job losses do not seem to be associated with lower educational outcomes in 2008 for the treatment group. However, estimates of ρ would be biased if students affected by father's job loss had changed/left school by the academic year 2012.[21] This does not seem to be a cause for concern since the drop-out rate

[20] See, for instance, the contribution by Heckman and Urzua (2010) and the critique to the questions that LATE can answer.

[21] Since I only could distribute the survey to those parents of students that in the academic year 2012 were

for the school in both kindergarten and primary school grades is quite stable during the period of observation and around 0.6% per year. In compulsory secondary school, the average annual drop-out rate is a bit larger and around 3.3%. However, it doesn't seem to be a reason for concern either, since it decreased (rather than increased) from academic year 2008 to academic year 2011 (last year for which I have data on school drop-out rates available). Also, the principals argued that the main reason for compulsory secondary school drop-out is related to the fact that some students turning 16 in the academic year are allowed to quit school by law once they turn 16, and some of them therefore abandon the school system. Moreover, the reader could think that estimates would be biased if students that otherwise would have enrolled in this particular school, did not do it as a result of father's job loss. However, given the sample restrictions applied, all the students in the restricted sample had to be enrolled in the school before the beginning of the Great Recession in order to be able to observe them both in 2008 and 2012. Additionally, estimates could be biased if parents would compensate their children by helping them more with homework after job loss. Unfortunately, this data was not collected in the survey. Finally, I am implicitly assuming here that school inputs are not altered by parental job loss. That is, that the school does not adapt the level of inputs administered to help those students suffering from parental job loss. Estimates of father's job loss would be (downward) biased if this assumption does not hold. All in all, given the characteristics of the sample outlined in Chapter 1 (concerted school, slightly better students handing in the parental questionnaires, etc.), the results shown in the next section are probably a downward biased estimate of the effect of father's job loss on school performance for the Spanish population of students in compulsory education during the Great Recession in Spain.

2.5 Results

2.5.1 Average effects of father's job loss on children's school performance

Table 1 presents the results on the average effect of father's job loss using the two different measures of school performance described in the previous sections. The first 4 columns of the table focus on the results using the average grade as the dependent variable. Standard errors are clustered at the student level. All models include year dummies, and dummies controlling for the stage of education the student is in year t. The results of an OLS regression are shown in column 1. Omitting fixed effects, father's job loss (FJL from now onwards) does not have a significant effect on the average grade. However, including fixed effects (see model 2) the coefficient of the FJL variable becomes negative and significant. After father's job loss, from a mean of 3.69 points (in a 1 to 5 scale), students suffer a yearly average decrease in the average

enrolled at school, it could be that previous to 2012, students affected by parental job loss had dropped out from this school and enrolled into a public one.

grade of 0.113 points.[22] In column 3, a dummy variable is added to control for repetition of grades (this variable equals 1 if the student is retaking that particular grade) and a dummy variable that captures whether the grades correspond to years in the school where the survey was administered. The point estimate barely changes after the inclusion of these additional explanatory variables.[23] In model 4, estimates of the fixed effects model are presented for a sample restricted to exclude those students whose fathers have experienced 2 job losses in the period. Stevens (1997) studies the effects of multiple job losses on earnings, and finds that much of the persistence in the earnings losses can be explained by additional job losses in the years following an initial displacement. Initial displacements predict future displacements and thus, subsequent displacements might not be exogenous (in the sense that they might no longer be attributed to the combination of Great Recession and fixed effects). Multiple job losses could be due to unobserved time varying heterogeneity that could bias the estimates. By excluding from the sample those students whose fathers lost the job more than once in the period under analysis, the estimate remains negative, significant and slightly bigger in magnitude. From now on, I will show the results both for the initial restricted sample as well as for the sample that excludes those students whose fathers suffer more than a job loss in the period.

[22]This difference between the OLS and fixed effect estimators is worth commenting on. Without taking into account the panel nature of the data in the estimation, FJL does not have a significant impact on grades. As shown in Figure 2, both control and treated students suffer a decrease in school performance during the period that is captured by the year dummies in the model and the dummies for the stage of education. The fixed effects estimator exploits the variation within the individual instead, and captures the additional decrease in grades experienced by treated individuals (once the effect of year dummies and the stage of education has been taken into account). Also, as pointed out in Section 2.4, in models with fixed effects the data are only informative about the impact of binary regressors on individuals for whom the value of the regressor changes over the period of observation. In this sense, fixed effect estimates are analogous to local average treatment effects coming from an instrumental variable setting (Imbens and Angrist, 1994). This would imply that the fixed effects results are not directly comparable to OLS estimates.

[23]Note that it is not clear that these two variables should be included as a control since they could be considered outcome variables. Nonetheless, in both cases less than 1% of the observations are classified as repeating a grade or not in the school where the survey was administered, and the results barely change.

Table 1: **Average effect of FJL on the average grade and percentile rank**

	Dep variable: average grade				Dep variable: percentile rank			
	M.1	M.2	M.3	M.4	M.5	M.6	M.7	M.8
FJL	0.012	-0.113**	-0.118**	-0.142**	-0.003	-0.044**	-0.044**	-0.055**
	(0.111)	(0.057)	(0.057)	(0.066)	(0.041)	(0.022)	(0.022)	(0.025)
Mean	3.706	3.706	3.706	3.678	0.526	0.526	0.526	0.519
SD	0.839	0.839	0.839	0.855	0.291	0.291	0.291	0.296
N	890	890	890	830	890	890	890	830
Students	178	178	178	166	178	178	178	166
Subsample	Rest	Rest	Rest	Rest	Rest	Rest	Rest	Rest
				Exclude 2JL				Exclude 2JL
Fixed effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Extra controls	No	No	Yes	Yes	No	No	Yes	Yes

Dep variable (first 4 columns): Average grade for the whole sample (excluding students in post-compulsory education), has a mean of 3.69 and SD of 0.89. Dep variable (last 4 columns): Average percentile rank for the whole sample (excluding students in post-compulsory education) has a mean of 0.50 and SD of 0.28. *, **, *** denote significance at the 10%, 5% and 1% levels. FJL (father's job loss): dummy equal to 1 from the year the father loses the job. Clustered robust standard errors at the student level in parentheses. All models include year dummies, and dummies for stage of education. Extra controls are indicators for whether the student is re-taking that particular grade, and whether the average grades belong to classes taken in the school where the survey was distributed. Definitions of subsamples explained in the text.

The last 4 columns of Table 1 present the same structure as the first 4 columns, but using the percentile rank of the student in her cohort as the dependent variable. The same pattern described for the average grade emerges. The percentile rank in the class decreases on average around 4.4 percentage points after father's job loss in the restricted sample and 5.5 percentage points when students with fathers experiencing two job losses are excluded.[24]

In terms of standard deviations, FJL entails a (yearly) average decrease in children's average grades of about 13.2 to 16% of the population standard deviation. For the percentile rank measure, it implies a decrease of about 15.7 to 19.6% of the population standard deviation. Compared to Rege et al. (2011), that find an effect of father plant closure on the grade point average of 16 year old students of about 6.3% of the population standard deviation, the results here show that the effects of father's job loss on the school performance of their offspring during a deep economic crisis are bigger in magnitude. However, the results in this chapter are an average of the effects of FJL across different ages, since students included had ages ranging between 8 and 17 in the academic year 2012, and are the result of estimations including fixed

[24]Even if convenient for its simplicity, the results using the linear fixed effects model do not take into account the special nature of the percentile rank variable, that takes values between 0 and 1. Using a linear functional form for the conditional mean might miss important non-linearities, as suggested by Papke and Wooldridge (2008) and the estimated expected values might not lie between 0 and 1. Papke and Wooldridge (2008) propose using fractional probit models for panel data in these cases, using a probit link function. The average partial effects obtained after estimating fractional probit models using the generalised estimating equation approach with an exchangeable working correlation matrix are, however, very similar to those obtained in Table 1: -0.039 (s.e: 0.021) and -0.052 (s.e: 0.0237), are the average partial effects that would compare to the point estimates in columns 7 and 8 of Table 1, respectively.

effects (Rege et al. (2011) work with a cross section of 10th graders in Norway).[25]

The previous results are based on the restricted sample, i.e., the one resulting after applying the sample restriction criteria outlined in Section 2.3. Table 2 presents results using the whole sample and different subsamples, using again the average grade (first 5 columns) and the percentile rank (last 5 columns) as dependent variables. Father's job loss does not have a significant impact on average grades when using all the sample.[26] By excluding those students that are in post-compulsory education (High-School) in column 2, FJL becomes significant at the 10% level. The evidence in column 3, that considers exclusively students that in 2012 are already on post-compulsory education, suggests that the school performance of these older students is not negatively affected by FJL. If anything, the evidence suggests rather the contrary. This suggestive evidence is in line with the intuition in Section 2.2, whereby father's job loss could be introducing a positive distortion in the tastes for effort for older students. Starting with the number of observations in column 2, column 4 makes additional restrictions. First, I don't include those students whose father was already retired at the beginning of the period. Moreover, given that the estimation strategy relies on within individual differences, I only include those students for which I can observe their school performance for 2 periods or more.[27] Finally, given that I want to compare within individual pre-father's job loss outcomes with post-father's job loss outcomes, I exclude those students whose fathers were already unemployed in 2008. Column 5 applies the additional restriction of excluding those students whose fathers have experienced more than a job loss in the period. By applying these restrictions, compared to column 3, the point estimates change slightly but the variability increases and makes the estimates not significant (p-values are 0.106 and 0.121, respectively). The right part of the table presents the results using the percentile rank measure instead. The same pattern emerges, although this time the impact of FJL is significant in all columns except in column 6, because High-School students are included. In general, for the models excluding HS students, a decrease in the absolute magnitude of the point estimate of FJL was expected a priori since these bigger samples include students whose school performance is not observed during all the 5 years. In particular, the years missing for these additional observations are observations at the beginning of the period: before father's job loss occurs or right after that.

[25]Table A5 reproduces the results of models 3 and 4 using the two measures of school performance computed under the assumptions of measure 2 instead (see Section 2.3). The results obtained are almost identical. Thus, from now on I will only reproduce the results using the measures of school performance computed under the assumptions of measure 1.

[26]The number of observations in the sample is 408. I lose 30 observations in both columns 1 and 6 because the father does not live in the house at the moment the survey was distributed, and therefore, I do not have information on the labour situation of fathers in these cases.

[27]When talking about the unrestricted sample in the next section, this is the sample that I will be referring to.

Table 2: **Average effect of FJL on the average grade and percentile rank - Unrestricted samples**

	Dep variable: average grade					Dep variable: percentile rank				
	M.1	M.2	M.3	M.4	M.5	M.6	M.7	M.8	M.9	M.10
FJL	-0.048	-0.086*	0.238	-0.082	-0.089	-0.017	-0.034*	0.082*	-0.033*	-0.038*
	(0.046)	(0.049)	(0.156)	(0.050)	(0.057)	(0.017)	(0.018)	(0.045)	(0.019)	(0.021)
Mean	3.673	3.733	3.298	3.715	3.687	0.511	0.510	0.511	0.508	0.502
SD	0.905	0.893	0.891	0.887	0.897	0.288	0.289	0.281	0.289	0.292
N	1580	1360	220	1279	1201	1580	1360	220	1279	1201
Students	378	332	46	292	274	378	332	46	292	274
Subsample	All	Excl HS students	Only HS students	Unrest	Unrest Exclude 2JL	All	Excl HS students	Only HS students	Unrest	Unrest Exclude 2JL

FE estimates. Dep variable (first 5 columns): Average grade for the whole sample (excluding students in post-compulsory education), has a mean of 3.69 and SD of 0.89. Dep variable (last 5 columns): Average percentile rank for the whole sample (excluding students in post-compulsory education) has a mean of 0.50 and SD of 0.28. *, **, *** denote significance at the 10%, 5% and 1% levels. FJL (father's job loss): dummy equal to 1 from the year the father loses the job. Clustered robust standard errors at the student level in parentheses. All models include year dummies, dummies for stage of education, indicators for whether the student is re-taking that particular grade and whether the average grades belong to classes taken in the school where the survey was distributed. Definitions of subsamples explained in the text.

Going back to the restricted sample, Table A6 shows the results of the estimations of random effects models of the average grade (first 4 columns) and the percentile rank (last 4 columns), for the restricted sample, and excluding from the restricted sample those students with fathers that experienced 2 job losses in the period under analysis. This table is interesting for at least 2 reasons. First, by using the random effects model I can estimate the impact of time invariant variables and assess whether the results obtained are in line with those traditionally found in the economics of education literature. In general, the main regularities established in the empirical literature also hold for this sample (and also for the unrestricted one, even if results are not shown). Thus, females tend to perform better at school, those born in the first quarters of the year do better with respect to those born in the last quarter, and father's education (here defined as a dummy variable equal to 1 if the father has an education degree beyond high-school) has a positive and sizable impact both in the average grade and percentile rank of his offspring. These results are also interesting because they allow me to compare the results of random versus fixed effects models. The fact that the point estimates between the 2 estimators do not differ by a significant amount (Hausman tests can not reject the null of non systematic differences between FE and RE coefficients) suggests that the shocks to employment could be exogenous to the worker, even without conditioning on his (time invariant) characteristics. Moreover, placebo tests for the effect of future father job losses on school performance prior to job loss provide additional support to the interpretation of the effects as being of a causal nature. Table 3, panel A, shows the results of the impact of future job losses on average grades in 2008 (the first academic year in the sample, where by construction all students have employed fathers). In all cases the estimates are highly imprecise and not significantly different from zero. This finding provides evidence against the possibility that changes in household's unobservables simultaneously drive

FJL and school performance of their offspring, since otherwise we would probably expect to see significantly worse school performance prior to father's job loss. Moreover, Panel B suggests that the lack of significance of future FJL on school performance is not driven by the fact that I use a cross section instead of a panel to run the placebo test. Using the 2012 cross-section, the results in Panel B show that students that by 2012 have been affected by FJL suffer a significant decrease in school performance.

Table 3: **Placebo test: Impact of future job loss on the average grade and percentile rank of 2008**

	Dep variable: Average grade		Dep variable: Percentile rank	
	M.1	M.2	M.3	M.4
Panel A: Placebo - Impact of future father job losses using cross-section of 2008				
Future FJL	0.015	-0.067	-0.011	-0.029
	(0.104)	(0.123)	(0.041)	(0.048)
Mean	3.955	3.921	0.518	0.511
SD	0.801	0.815	0.286	0.288
Panel B: Impact of FJL using only cross-section of 2012				
FJL 2012	-0.199*	-0.272**	-0.090**	-0.115**
	(0.117)	(0.134)	(0.041)	(0.047)
Mean	3.619	3.596	0.539	0.536
SD	0.863	0.886	0.298	0.306
Students	178	166	178	166
Subsample	Rest	Rest	Rest	Rest
		Exclude 2JL		Exclude 2JL

Future FJL: dummy equal to 1 if the father will experience job loss in the future (at some point in subsequent observed academic years). FJL 2012: dummy equal to 1 if the father has experienced job loss after 2008. *, **, *** denote significance at the 10%, 5% and 1% levels. Robust standard errors in parentheses. All models include dummies for sex, father's education, quarter of birth, stage of education and whether the average grades belong to classes taken in the school where the survey was distributed. Definitions of subsamples explained in the text.

Even if according to the former placebo tests, future job losses do not significantly affect grades prior to father's job loss, this evidence does not guarantee that grades of treated and control students have parallel trends. That is, fathers who lost the job during the period under analysis could have been on a different trajectory on the labour market prior to 2008. Unfortunately, pre-2008 labour market and school performance data that could be used to test for differential trends between treated and control students is not available.[28] A way to partially address this issue is to check whether the effects of FJL are mainly driven by those students whose fathers had been working for a short time in the firm previous to job loss, indicating that these fathers could have been on a different (negative) trajectory prior to losing the job during the Great Recession. In order to verify this I restrict the sample to those students whose fathers, in 2008, had started working in the firm at least in 2007, 2006 and 2005 respectively.

[28]However, it is important to note that the fixed effect controls for static pre-2008 labour market experience (i.e., number of years in unemployment prior to the Great Recession).

The estimates in Table 4 show that the impact of FJL remains negative and significant in all cases. It is interesting to note that, the more years of tenure prior to FJL, the larger in absolute value the point estimates are. That is, the negative effect of FJL does not seem to be driven by those students whose fathers had lower tenure at the firm prior to job loss, but rather, by those fathers that had a more stable situation prior to losing the job. This evidence suggests that treated students were not on a different (negative) trend prior to father's job loss.

Table 4: **Robustness check: father's tenure before job loss**

	All restricted sample			All restricted sample-excl 2JL		
Father started working in 2008's firm during:	2007	2006	2005	2007	2006	2005
Panel A. Dep variable: Average grade						
FJL	-0.126**	-0.138**	-0.159**	-0.148**	-0.163**	-0.191**
	(0.059)	(0.061)	(0.068)	(0.067)	(0.069)	(0.078)
Mean	3.696	3.707	3.693	3.673	3.683	3.672
SD	0.844	0.841	0.855	0.856	0.854	0.870
Panel B. Dep variable: Percentile rank						
FJL	-0.050**	-0.052**	-0.056**	-0.058**	-0.061**	-0.070**
	(0.023)	(0.023)	(0.025)	(0.025)	(0.026)	(0.028)
Mean	0.523	0.526	0.522	0.518	0.520	0.518
SD	0.293	0.295	0.297	0.297	0.299	0.303
N	865	820	760	820	775	720
Students	173	164	152	164	155	144

FE estimates. FJL (father's job loss): dummy equal to 1 from the year the father loses the job. Average grade for the whole sample (excluding students in post-compulsory education) has a mean of 3.69 and SD of 0.89. Average percentile rank for the whole sample (excluding students in post-compulsory education) has a mean of 0.50 and SD of 0.28. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the student level in parentheses. All models include year dummies, and dummies for stage of education, indicators for whether the student is re-taking that particular grade, and whether the average grades belong to classes taken in the school where the survey was distributed. Definitions of subsamples explained in the text.

This chapter differs from almost all other papers in the related literature in the sense that job losses happen during a deep economic crisis rather than being the result of firm downsizes or plant closures for reasons other than an economic recession. In this regard, it might be that the Great Recession is also provoking job losses for mothers, and if mother and father job losses are somehow correlated (which is indeed the case in this sample, as it will be shown in Table 14,columns 4 and 8), then the effect of FJL could be capturing also the impact of mother's job loss (MJL from now onwards) on the average grades of their offspring. The results in Table 5 suggest that this is not the case, since the coefficient of the FJL variable retains its sign and magnitude after including the MJL variable.[29] Moreover, the coefficient on MJL, that is considerably smaller in absolute size, is not significantly different from zero in any of the specifications. These results hold both for the restricted sample and the restricted sample excluding those students whose fathers have suffered 2 job losses in the period analysed, and for

[29]The MJL variable is defined in the same way: it is equal to 1 from the (academic) year that the mother loses the job.

the two school performance measures (these results also hold for the unrestricted sample, even if results are not shown in the table). Additionally, doing the same exercise as for fathers, and applying the same exclusion criteria so that only students whose mothers were employed in 2008 are considered, I find no significant effect of MJL in any of the specifications (see Table A8). These findings are consistent with recent papers in health economics that have found that men suffer more negative health related consequences after job loss than women. For instance, Kuhn et al. (2009) find that job loss significantly increases expenditures for antidepressants and related drugs, as well as hospitalizations due to mental health problems for men, but not for women. Additionally, results from the social psychology field suggest that there are detrimental effects of job insecurity on money anxiety for men but not for women (Lim and Sng, 2006).

Table 5: **Average effect of FJL and MJL on the average grade and percentile rank**

	Dep variable: Average grade		Dep variable: Percentile rank	
	M.1	M.2	M.3	M.4
FJL	-0.117**	-0.142**	-0.043*	-0.053**
	(0.057)	(0.066)	(0.022)	(0.025)
MJL	-0.012	-0.006	-0.010	-0.017
	(0.085)	(0.094)	(0.030)	(0.033)
Mean	3.706	3.678	0.526	0.519
SD	0.839	0.855	0.291	0.296
N	890	830	890	830
Students	178	166	178	166
Subsample	Rest	Rest	Rest	Rest
		Exclude 2JL		Exclude 2JL

FE estimates. FJL/MJL (father's/mother's job loss): dummy equal to 1 from the year the father/mother loses the job. Average grade for the whole sample (excluding students in post-compulsory education) has a mean of 3.69 and SD of 0.89. Average percentile rank for the whole sample (excluding students in post-compulsory education) has a mean of 0.50 and SD of 0.28. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the student level in parentheses. All models include year dummies, and dummies for stage of education, indicators for whether the student is re-taking that particular grade, and whether the average grades belong to classes taken in the school where the survey was distributed. Definitions of subsamples explained in the text.

A series of additional robustness checks are presented in Tables A9, A10 and A11. First, Table A9 uses only the information corresponding to the academic years 2008, 2010 and 2012. As described in the Section 2.3, by restricting the sample to these periods I don't need to make any assumptions with regards to the exact date of job loss for some of the observations. Estimates from the fixed effect models show that the coefficients of the FJL variable are also negative and significant, and slightly bigger in magnitude (given that now the distance between observations is 2 years and therefore ρ captures that), both for the percentile rank and the average grade measure. Second, given the small sample size, it is also important to verify that outliers are not the main drivers of the results. In order to address this concern, Table A10 shows estimates when I drop observations at the extremes of the grade distribution.[30] For the two school per-

[30]I calculate the average change in the average grade and percentile rank between the academic years 2008 and

formance measures, applying these restrictions has almost no effect on the estimates. Finally, I calculate the percent of students suffering job loss in the same grade and year, and also in the same grade, year and class, as a way to control for peer group effects. Again, introducing these variables in the main specification (see Table A11) barely changes the point estimates of FJL. Moreover, the peer group effects coefficients are always not significantly different from zero.

Alternative treatment definitions

So far, the treatment variable has been defined as an absorbing state (i.e. it equals 1 from the moment the father loses the job, no matter his employment situation afterwards). This is because conditioning on worker's fixed effects, the Great Recession can be seen as providing an exogenous source of variation for losing the job. It is not as clear that finding a job afterwards, conditioning on fixed effects, fulfills equally the exogeneity assumption. Nonetheless, it is interesting to see what happens if I vary the treatment definition to allow those fathers finding a job to switch the treatment status. Table A7 shows the results of experimenting with two different treatment definitions. FJL (1) is a dummy variable that equals 1 the year the father loses the job and the years after job loss as long as the father remains unemployed, and it equals 0 when the father is employed. FJL (2) is a dummy variable that equals 1 the year the father loses the job (as long as he does not find a job the same year), and the years after job loss as long as the father remains unemployed. As for FJL (1), it equals 0 when the father is employed. That is, the only difference between FJL (1) and FJL (2) is that FJL (1) considers fathers during the year of job loss as treated, whereas FJL (2) only considers them as treated if they do not find a job during the same year. In this sense, FJL (2) would be capturing the effect of long term unemployment spells, whereas FJL (1) would be capturing the impact of father's job loss and long term unemployment. The results in column 1 and 2 of Table A7, suggest that the negative impact of father's job loss in the average grade is mainly driven by those fathers that stay unemployed at least for one academic year. The same holds for the percentile rank measure, columns 5 and 6, and when I exclude from the sample those fathers who suffer two job losses in the period.

Related to the previous evidence, it would be interesting to see whether the negative effects of job loss are offset once the father goes back to being employed. Unfortunately, the dataset is too small and short to provide a rigorous answer. A small exercise, though, is provided in Table A12. Considering those students whose fathers lost the job either in 2009 or 2010, I study the effects on school performance when the father gets back to work. I construct a variable that starts with a value of 0 for all these students in the first year (that would be 2009 or 2010,

2012 and I run the main specification excluding observations for which the average change falls in the 1st and 99th percentile, and the 5th and 95th percentile, respectively.

depending on the year of father's job loss), and it switches to a value of 1 for the periods when the father goes back to work. In general, there doesn't seem to be an impact of the father's getting back to work on the average grade, although the evidence suggests that once the father is back to being employed, students start improving their ranking in their cohort again. In any case, this is just a preliminary exercise and further data would needed to examine whether the effects of job loss and finding a job are symmetric.

2.5.2 Heterogeneous effects and possible mechanisms

Following the related literature, I analyse whether the impact of father's job loss is heterogeneous across different subgroups in the sample, and the possible mechanisms by which father's job loss has a negative effect on the school performance of their offspring. The results need to be taken with caution given the limitation posed by the sample size (standard errors tend to be large), but nevertheless they add new and interesting suggestive evidence of the likely mechanisms operating behind the detrimental effect of father's job loss on the school performance of their offspring that merit consideration for future research.

Father's education and the probability to find a job

In this section I study whether the effect of FJL differs with the level of education of the father. I group fathers in two groups according to their level of education. Those with a high level of education are those with a degree beyond a high-school diploma, and those with a low level of education are those that have a high-school diploma or less. The results in Table 6 show that the effect of father's job loss is negative and significant for those students whose fathers have a low level of education, and that this effect is significantly different from the effect on the sub-sample of treated students whose fathers have a high level of education. This holds for almost all the specifications in the table, in particular when using the average grade of the student as the dependent variable. Thus, these results would indicate that on the one side, the effect of job loss is concentrated on disadvantaged families, as measured by the level of education of the father. On the other, that there is no effect, or a slightly positive effect, if FJL occurs in families where the father has a high level of education. The direction of the results is in line with the ones found by Rege et al. (2011) and Stevens and Schaller (2011), although in their case, the confidence intervals around the estimates were too large to draw any strong conclusions.

The differential impact of father's job loss on children's school performance between these two subgroups could be explained by distinct income changes after job loss. Displaced workers suffer short-run earning losses that persist in the long run (Jacobson et al., 1993). Even if children in the restricted sample are always facing a very similar level of school inputs (i.e., they are always observed in the same school), less income after job loss could mean that families

Table 6: **Heterogeneous effects of FJL by the level of education of the father**

	Dep variable: Average grade				Dep variable: Percentile rank			
	M.1	M.2	M.3	M.4	M.5	M.6	M.7	M.8
FJL	-0.168**	-0.210***	-0.141**	-0.169***	-0.059**	-0.077***	-0.048**	-0.061***
	(0.071)	(0.075)	(0.062)	(0.064)	(0.025)	(0.026)	(0.022)	(0.022)
FJL*Father	0.167*	0.315***	0.203**	0.347***	0.048	0.102*	0.051	0.099**
high educ	(0.093)	(0.117)	(0.086)	(0.101)	(0.041)	(0.057)	(0.038)	(0.048)
Mean	3.706	3.678	3.715	3.687	0.526	0.519	0.508	0.502
SD	0.839	0.855	0.887	0.897	0.291	0.296	0.289	0.292
N	890	830	1279	1201	890	830	1279	1201
Students	178	166	292	274	178	166	292	274
Subsample	Rest	Rest	Unrest	Unrest	Rest	Rest	Unrest	Unrest
		Exclude 2JL		Exclude 2JL		Exclude 2JL		Exclude 2JL

FE estimates. FJL: dummy equal to 1 from the year the father loses the job. Father high educ is a dummy variable equal to 1 if the father has a level of education beyond high-school. Average grade for the whole sample (excluding students in post-compulsory education) has a mean of 3.69 and SD of 0.89. Average percentile rank for the whole sample (excluding students in post-compulsory education) has a mean of 0.50 and SD of 0.28. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the student level in parentheses. All models include year dummies, and dummies for stage of education, indicators for whether the student is re-taking that particular grade, and whether the average grades belong to classes taken in the school where the survey was distributed. Definitions of subsamples explained in the text. From the treated students, 17 of them have a father with a high level of education whereas 37 of them have a father with a low level of education.

could adjust downwards the level of spending in, for instance, external support with homework. Table 7 shows a large decrease in net income following job loss for both the restricted (Panel A, model 1) and the unrestricted sample (Panel B, model 1).[31] Results excluding students whose fathers suffered two job losses in the period are shown for both samples in the right part of the table. Dividing the sample in two different subsamples according to the level of education of the father, in both of them significantly less fathers are observed in the high income category after job loss. And even though the estimates corresponding to the subsample of children whose fathers have a high education education level are not significant in 3 out of the 4 models, the confidence intervals for the estimates in the two subsamples overlap. This evidence seems to suggest that income reductions are not one of the main channels driving the differential impact of FJL between the two subgroups, although results have to be taken with care given missing responses in the income question. Moreover, if families with better educated fathers had more savings to start with, they could use these to adjust for the reduced income after job loss. Unfortunately, the dataset does not contain information on savings to test this hypothesis. Information on help received with homework, to account for potential changes between the two subsamples, is not available either.[32] Finally, income reductions could be explaining this dissimilar effect if men

[31]Net monthly income information comes from the following survey question: NET monthly income in euros (includes your salary, unemployment benefits, pension, or other subsidies). Possible answers are (1) less than 999 euros, (2) Between 1000 and 1499 euros, (3) Between 1500 and 1999 euros, and (4) More than 2000 euros. The father is classified as having a high income in 2008 if he marked options (3) or (4), that is, if the father has a net income above 1500 euros. This threshold is very close to the average wage in Catalonia, according to the Annual Wage Structure Survey for 2008-2009.

[32]However, hiring people to help children with homework does not seem an option widely used in Spain. According to the data in the Evaluación General de Diagnóstico, a Spanish representative survey that evaluates the level of achievement in basic skills for 4th-year primary school graders in 2009, only 10% of students were

Table 7: **Are the heterogeneous effects of father education driven by income? Effects of FJL on income by father's education**

Dependent variable: Dummy equal to 1 if father has high income						
		All		Excluding fathers with 2 job losses		
	M.1	M.2	M.3	M.4	M.5	M.6
Panel A: Restricted sample						
FJL	-0.318***	-0.361***	-0.229	-0.339***	-0.339**	-0.346
	(0.099)	(0.118)	(0.174)	(0.124)	(0.132)	(0.308)
Mean	0.647	0.577	0.755	0.668	0.598	0.785
SD	0.478	0.495	0.431	0.471	0.491	0.412
N	829	506	323	770	482	288
Students	169	104	65	157	99	58
Panel B: Unrestricted sample						
FJL	-0.352***	-0.406***	-0.227	-0.414***	-0.404***	-0.441**
	(0.084)	(0.094)	(0.172)	(0.097)	(0.106)	(0.218)
Mean	0.650	0.557	0.796	0.666	0.572	0.817
SD	0.477	0.497	0.404	0.472	0.495	0.387
N	1333	814	519	1250	774	476
Students	279	171	108	261	162	99
Subsample	All observed	Father low education	Father high education	All observed	Father low education	Father high education

FE estimates. FJL (father's job loss): dummy equal to 1 from the year the father loses the job. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the household level in parentheses. Extra controls are year dummies. Dependent variable: Dummy equal to 1 if father has high income (i.e., above 1500 euros).

with different levels of education would face distinctly the money anxiety attached to income reductions, and this, in turn, could affect somehow the school performance of their offspring. Again, data is not available to further explore this option. If data becomes available in the future, all these hypothesis could be the object of future research.

One of the potential explanations of the differential effects of FJL by the level of education of the father could be the distinct probabilities of finding a job during the Great Recession. Using the data from the first quarter of 2012 of the Spanish Labour Force Survey, I estimate the probability of finding a job in Catalonia for those male individuals that have children aged 0 to 20. Table A13 shows the results of logistic regressions for the probability of finding a job under different specifications. The dependent variable is equal to 1 if the individual has started working in the firm in the last 12 months or has already found a job, and 0 if the individual is unemployed. The results show that immigrants, those aged more than 45 and those working in the construction sector before becoming unemployed, are more likely to remain in unemployment. In contrast, those with a level of education beyond high school are between 2 and 3 times more likely to have found a job. The level of education of the father is, therefore, one of the main determinants of the probability of finding a job in Catalonia. Using Model 3 in that table, I have constructed out-of-sample predictions of the probability of finding a job for the fathers in my sample.[33] Table 8 explores the effect on school performance of the interaction

receiving external help, i.e. not coming from the family, in order to complete their homework.

[33]The other models lose a considerable amount of observations because the sector of activity variables are only defined if the individual has been unemployed for less than a year.

between the FJL variable and the out-of-sample predictions of the probability of finding a job that the father has according to the data in the Spanish Labour Force Survey.[34] The results in Table 8 for the average grade show that the detrimental effects of FJL decrease when the probability of finding a job increases, although the same does not happen for the percentile rank variable. Given that father's education is one of the main determinants of this probability, the more detrimental effects of FJL for students whose fathers have a low level of education could be explained by their father's lower probability of finding a job. These results are in line with those found in Section 2.5.1, that suggested that the negative impact of father's job loss in the average grade is mainly driven by those fathers that stay unemployed at least for one academic year.

Table 8: **Heterogeneous effects of FJL: Probability of finding a job**

	Dep variable: Average grade				Dep variable: Percentile rank			
	M.1	M.2	M.3	M.4	M.5	M.6	M.7	M.8
FJL	-0.117**	-0.141**	-0.082*	-0.092	-0.044**	-0.054**	-0.033*	-0.038*
	(0.056)	(0.065)	(0.050)	(0.056)	(0.022)	(0.024)	(0.019)	(0.021)
FJL*PFJ	0.004	0.008*	0.005*	0.007**	0.000	0.001	0.000	0.001
	(0.003)	(0.004)	(0.003)	(0.003)	(0.001)	(0.002)	(0.001)	(0.001)
Mean	3.706	3.678	3.715	3.687	0.526	0.519	0.508	0.502
SD	0.839	0.855	0.887	0.897	0.291	0.296	0.289	0.292
N	890	830	1279	1201	890	830	1279	1201
Students	178	166	292	274	178	166	292	274
Subsample	Rest	Rest	Unrest	Unrest	Rest	Rest	Unrest	Unrest
		Exclude 2JL		Exclude 2JL		Exclude 2JL		Exclude 2JL

FE estimates. FJL: dummy equal to 1 from the year the father loses the job. PFJ: Probability of finding a job calculated from out-of-sample predictions using Model 3 in Table A13, and centered at the mean value for those suffering job loss in each sample. Average grade for the whole sample (excluding students in post-compulsory education) has a mean of 3.69 and SD of 0.89. Average percentile rank for the whole sample (excluding students in post-compulsory education) has a mean of 0.50 and SD of 0.28. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the student level in parentheses. All models include year dummies, and dummies for stage of education, indicators for whether the student is re-taking that particular grade, and whether the average grades belong to classes taken in the school where the survey was distributed. Definitions of subsamples explained in the text.

Income, motivation at work and type of job loss

This section explores whether there are heterogeneous effects of FJL according to the level of net income and motivation at work prior to job loss. Given that both the income and motivation at work variables have some missing values (see Table A3), and given the small size of the sample, results have to be interpreted with caution. Nonetheless, they can offer some suggestive evidence regarding the potential mechanisms behind the effect of FJL on school performance. Additionally, I also analyse the existence of heterogeneous effects with regards to the type of job loss suffered by the father (i.e whether the father had his own business or was working for

[34]The probability of finding a job variable is centered at the mean value for those suffering job loss in each sample.

a firm in 2008).

Table 9: **Heterogeneous effects according to father's net income in 2008**

	Restricted sample			Rest sample, excluding fathers with 2 job losses		
	M.1	M.2	M.3	M.4	M.5	M.6
Panel 1. Dep variable: Average grade						
FJL	-0.083	0.036	-0.120*	-0.113	0.002	-0.144**
	(0.063)	(0.125)	(0.064)	(0.070)	(0.147)	(0.069)
FJL * low	0.005			0.032		
income 2008	(0.115)			(0.147)		
Mean	3.729	3.733	3.727	3.699	3.682	3.705
SD	0.831	0.838	0.829	0.849	0.868	0.842
Panel 2. Dep variable: Percentile rank in the year-grade combination						
FJL	-0.041	0.022	-0.053**	-0.062**	0.011	-0.072**
	(0.026)	(0.043)	(0.027)	(0.028)	(0.049)	(0.028)
FJL * low	0.020			0.043		
income 2008	(0.047)			(0.056)		
Mean	0.532	0.527	0.534	0.525	0.515	0.529
SD	0.287	0.295	0.284	0.292	0.301	0.289
N	815	240	575	755	210	545
Subsample	All -income observed	2008 Low income	2008 High income	All -income observed	2008 Low income	2008 High income

FE estimates. Measure 1 of both percentile rank and average grade used. FJL (father's job loss): dummy equal to 1 from the year the father loses the job. Average grade for the whole sample (excluding students in post-compulsory education) has a mean of 3.69 and SD of 0.89. Average percentile rank for the whole sample (excluding students in post-compulsory education) has a mean of 0.50 and SD of 0.28. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the student level. Extra controls for all models are: year dummies, dummies for stage of education, a dummy for whether the student is re-taking that particular grade, and whether the grades belong to years in this school.

Table 9 analyses whether there are heterogeneous effects of FJL according to the level of income prior to job loss (i.e, in 2008). The table shows the results for the restricted sample of 178 students in the first three columns, whereas columns 4 to 6 present the results for the sample that further excludes those students whose fathers have suffered more than a job loss in the period. In the first panel of the table, the variable under study is the average grade. The second panel reproduces the same models but with the percentile rank in the cohort of the student as the dependent variable. Placing the focus on the left part of the table first, the estimates in both panels (columns 2 and 3) suggest sizable differences for the effect of FJL on school performance in both subsamples. However, the estimates for the low income category are very imprecise, and its confidence interval overlaps with the one for the estimate in the high income subsample. Accordingly, the interaction term in model 1, even if positive, is never significantly different from zero. Together with showing the results for the two subsamples, Rege et al. (2011) analyse the impact of plant closure on subsequent earnings and full-time employment on the two subsamples, to argue whether the differential effects of plant closure on school performance could be explained by a distinct impact on father's income and employment probabilities. As

seen in Table 7 (model 1, panels A and B), there's a substantial decrease of those fathers that after job loss are in the high income category (net income above 1500 euros). Even if the results are not shown, fathers with a low level of income prior to job loss are 17 percentage point less likely to have a level of net income above 1000 euros (category 2 or higher) after job loss. In the same vein, fathers with a high level of income prior to job loss are 26 percentage points less likely to be observed in the highest income category (net income above 2000 euros). In both cases, the results obtained from fixed effect regressions that control for year dummies, using the restricted sample, are significantly different from zero. Thus, even in the absence of continuous data on income, the results suggest that both groups suffer important income losses after job loss. In terms of employment, by year 2012, both groups had a similar proportion of treated individuals that had gotten back to work. In general, excluding those children whose fathers suffered two job losses in the period, the results are very similar to those already described.

Given the nature of my data, the indicator of father's job loss includes fathers displaced while working for a firm and fathers that owned his own business in 2008, but closed it down after the Great Recession hit the Spanish economy. An additional interesting question that can be analysed with this data concerns the differential effects of FJL on school performance according to the type of ownership relation that the father had with the firm previous to job loss. If job loss carries negatives consequences for the displaced worker, even more negative costs could be expected for those fathers who lost their jobs because their own business failed. Ucbasaran et al. (2013) review the literature on the consequences of business failure for entrepreneurs, and classify the costs of business failure into financial, social and psychological. In my sample though, even if possibly present, social and psychological effects could be expected to be lower than under normal circumstances, because failure could be easily associated with the economic crisis, and not with personal failure. Financially, there are important differences between the level of unemployment protection for those workers losing the job and those workers closing their own business. Those fathers displaced while working for a firm were entitled to receive unemployment benefits as long as they had worked more than 360 days during the last 6 years. The duration of the unemployment benefits depends on tenure prior to job loss (from 120 days for those with less than 539 days of tenure, to 2 years for those with more than 2160 days of tenure prior to job loss). The amount received also varies with the wage prior to job loss.[35] On the contrary, the unemployment protection for those workers owning their own business (trabajadores autónomos, in Spanish) was almost non-existent during the period under analysis.[36]

[35]During the period under analysis, workers received 70% of the so-called regulatory base during the first 6 months, and 60% of wages after seven months in unemployment, as long as they were still entitled to receive unemployment benefits.

[36]On November 6th, 2010, a new law became effective. Under this law, *autónomos* workers would be entitled to receive some sort of unemployment insurance after justifying, among other things, that they had to close their business for economic reasons. However, by 2012, the 87% of claims had been denied given the difficulty to justify losses

Table 10: **Heterogeneous effects: Closing own business versus losing the job**

	Restricted sample			Rest sample, excluding fathers with 2 job losses		
	M.1	M.2	M.3	M.4	M.5	M.6
Panel 1. Dep variable: Average grade						
FJL	-0.212**	-0.063	-0.217**	-0.208*	-0.094	-0.200*
	(0.093)	(0.068)	(0.103)	(0.108)	(0.081)	(0.112)
FJL * Worker	0.137			0.101		
in a firm in 2008	(0.110)			(0.132)		
Mean	3.706	3.777	3.509	3.678	3.752	3.479
SD	0.839	0.825	0.849	0.855	0.846	0.851
N	890	655	235	830	605	225
Panel 2. Dep variable: Percentile rank in the year-grade combination						
FJL	-0.075**	-0.028	-0.076**	-0.067*	-0.046	-0.063*
	(0.031)	(0.028)	(0.037)	(0.034)	(0.033)	(0.036)
FJL * Worker	0.044			0.019		
in a firm in 2008	(0.039)			(0.046)		
Mean	0.526	0.547	0.466	0.519	0.542	0.458
SD	0.291	0.286	0.299	0.296	0.291	0.302
N	890	655	235	830	605	225
Panel 3. Dep variable: Dummy equal to 1 if father has high income						
FJL	-0.318***	-0.310***	-0.316	-0.339***	-0.340**	-0.333
	(0.099)	(0.115)	(0.186)	(0.124)	(0.148)	(0.218)
Mean	0.647	0.645	0.652	0.668	0.675	0.645
SD	0.478	0.479	0.477	0.471	0.469	0.480
N	829	622	207	770	573	197
Subsample	All observed	2008 Father worker firm	2008 Father own business	All observed	2008 Father worker firm	2008 Father own business

FE estimates. Measure 1 of both percentile rank and average grade used. FJL (father's job loss): dummy equal to 1 from the year the father loses the job. Average grade for the whole sample (excluding students in post-compulsory education) has a mean of 3.69 and SD of 0.89. Average percentile rank for the whole sample (excluding students in post-compulsory education) has a mean of 0.50 and SD of 0.28. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the student level (Panel 1 and 2) and at the household level (Panel 3) in parentheses. Panel 1 and 2 extra controls for all models are: year dummies, dummies for stage of education, a dummy for whether the student is re-taking that particular grade, and whether the grades belong to years in this school. Panel 3 extra controls are year dummies. Difference in N between panel 1 and 2, on the one hand, and 3, due to missing observations in father's income.

Table 10 presents the results that analyse whether there are heterogeneous effects between students whose fathers, previous to job loss, had their own business or, instead, were working for a firm. The interaction term summarising the effects of FJL on school performance for those children whose fathers worked for a firm is positive, but insignificant in all cases. Splitting the sample, the loss in income is very similar in magnitude for both subsamples, although the estimate is not significant for the subsample of those children whose fathers owned a firm in 2008. In general, even though insignificant, the estimates signal a larger decrease in the average grade for those children whose fathers closed their own business after 2008 that does not seem to be related to distinct income losses.

during the previous 3 years. See data on: *http* : *//www.*20*minutos.es/noticia/*1723441*/*0*/autonomos/cobran* − *paro/cese* − *actividad/* (accessed on 10/11/2014).

A strand of literature in the social psychology field suggests that workers affected by massive layoffs have prevalent feelings of job insecurity and job loss leaves them anxious, angry and demoralised (Barling et al., 1999b). At the same time, Barling et al. (1999b) state that from as young as 5 years of age, children understand such concepts as pay, labour disputes, unemployment, and, in general, the working conditions of their parents. According to this evidence there could be differential effects of FJL on school performance according to the level of work motivation of fathers prior to job loss. In particular, are there differential effects of FJL on school performance, between those children whose fathers were highly motivated at work previous to losing their jobs and those children whose fathers were not as motivated? Does motivation at work change after job loss, and if so, could it be a driving mechanism for the effect of FJL on school performance?

Results are presented in Table 11. As stated at the beginning of the section, though, the motivation at work variable has some missing values (see Table A3) and is not available for those fathers that remain unemployed. This, together with the small small sample size, advises to interpret the results with caution. Separating the sample in two different subsamples, the effect of FJL on motivation at work for fathers is significantly different and goes in opposite directions (panel 3).[37] The results in Panel 3 suggest that conditional on finding employment, fathers who were highly motivated in their jobs in 2008 suffer a significant reduction in their level of motivation in their new jobs, once job loss occurs and they go back to work. On the contrary, fathers who were less motivated at work in 2008 increase significantly their level of motivation at work after job loss. However, model 1 in both panels 1 and 2 suggest that there are no significant differences on school performance between children whose parents were high versus low motivated at their jobs in 2008. However, albeit imprecise, the estimates seem to suggest that those children whose fathers had already a low motivation at work suffered a lower negative impact on school performance. Results when excluding those children whose fathers suffer two job losses in the period seem to be more supportive of the social psychologists hypothesis. Even though the interaction is not significant in either panel 1 or 2, the estimates for the interaction are more precise than the ones shown in the left part of the table. Therefore, even if the results are far from being conclusive and they should be taken with care, they could be indicating a potential mechanism behind the detrimental impact of FJL on school performance: the effects that job loss could entail via a deterioration of father's mood and motivation in general.

[37] This data, however, is only available for those that found a new job after job loss.

Table 11: **Heterogeneous effects according to father's motivation at work in 2008**

	Restricted sample			Rest sample, excluding fathers with 2 job losses		
	M.1	M.2	M.3	M.4	M.5	M.6
Panel 1. Dep variable: Average grade						
FJL	-0.131*	0.053	-0.156**	-0.172**	0.066	-0.201**
	(0.071)	(0.152)	(0.071)	(0.082)	(0.161)	(0.081)
FJL * low	0.137			0.195		
motiv 2008	(0.129)			(0.148)		
Mean	3.709	3.646	3.729	3.683	3.612	3.706
SD	0.850	0.870	0.843	0.865	0.878	0.860
N	785	190	595	735	180	555
Panel 2. Dep variable: Percentile rank in the year-grade combination						
FJL	-0.050*	-0.020	-0.051*	-0.069**	-0.014	-0.069**
	(0.029)	(0.061)	(0.029)	(0.032)	(0.064)	(0.032)
FJL * low	0.039			0.069		
motiv 2008	(0.052)			(0.059)		
Mean	0.530	0.515	0.535	0.525	0.503	0.532
SD	0.292	0.286	0.294	0.297	0.288	0.299
N	785	190	595	735	180	555
Panel 3. Dep variable: Dummy equal to 1 if father is highly motivated at work						
FJL	-0.034	0.578**	-0.383***	-0.040	0.673***	-0.506***
	(0.172)	(0.217)	(0.139)	(0.159)	(0.213)	(0.158)
Mean	0.771	0.152	0.964	0.770	0.159	0.962
SD	0.420	0.360	0.186	0.421	0.367	0.191
N	748	178	558	710	170	528
Subsample	All -motiv observed	2008 Low motivation	2008 High motivation	All -motiv observed	2008 Low motivation	2008 High motivation

FE estimates. Measure 1 of both percentile rank and average grade used. FJL (father's job loss): dummy equal to 1 from the year the father loses the job. Average grade for the whole sample (excluding students in post-compulsory education) has a mean of 3.69 and SD of 0.89. Average percentile rank for the whole sample (excluding students in post-compulsory education) has a mean of 0.50 and SD of 0.28. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the student level (Panel 1 and 2) and at the household level (Panel 3) in parentheses. Panel 1 and 2 extra controls for all models are: year dummies, dummies for stage of education, a dummy for whether the student is re-taking that particular grade, and whether the grades belong to years in this school. Panel 3 extra controls are year dummies. Difference in N between panel 1 and 2, on the one hand, and 3, due to missing observations in father's motivation at work.

Age and sex of the student

The early childhood development literature emphasises the importance of parental characteristics and early home environment in producing cognitive skills. Following this literature, Cunha et al. (2006) propose a model of skill accumulation in which childhood has more than one stage and by which early investments in skills are both self-productive (skills produced at one stage augment skills attained at later stages), and complementary (skills produced at one stage raise the productivity of investment at subsequent stages). Thus, everything else equal, the negative shock to parental inputs that parental job loss produces should have bigger effects on school performance the younger the children are. However, parental job loss could also distort the

Table 12: **Other heterogenous effects of FJL on the average grade: Age of the student**

	Restricted sample			Rest sample, excluding fathers with 2 job losses		
	M.1	M.2	M.3	M.4	M.5	M.6
FJL	-0.178**	-0.169***	-0.151***	-0.225**	-0.192***	-0.156**
	(0.072)	(0.051)	(0.053)	(0.087)	(0.060)	(0.070)
FJL * Student in	0.070			0.120		
secondary in 2012	(0.104)			(0.123)		
FJL * Kinder		0.200			0.151	
		(0.223)			(0.293)	
FJL * Secondary		0.032			0.052	
		(0.104)			(0.116)	
FJL * FJL happened			0.118			0.023
in kinder			(0.198)			(0.222)
FJL * FJL happened			-0.057			-0.054
in secondary			(0.151)			(0.158)
Mean	3.706	3.706	3.706	3.678	3.678	3.678
SD	0.839	0.839	0.839	0.855	0.855	0.855
N	890	890	890	830	830	830

FE estimates. Dependent variable: average grade (measure 1). FJL (father's job loss): dummy equal to 1 from the year the father loses the job. Average grade for the whole sample (excluding students in post-compulsory education) has a mean of 3.69 and SD of 0.89. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the student level in parentheses. Extra controls for all models are: year dummies, dummies for stage of education, a dummy for whether the student is re-taking that particular grade, and whether the grades belong to years in this school.

incentives to study of children suffering from parental job loss. A priori, one would expect that these distortions in incentives are bigger the older the children are when parental job loss occurs, given that older children are more aware of the value of education. As seen before, though, the direction of the effect of FJL on student's incentives is not clear. On the one hand, it could be that children of those fathers suffering job loss have an additional incentive to perform better at school to avoid experiencing job loss themselves in the future. In this case, parental job loss would have a more negative effect for younger children. But on the other hand, parental job loss could demotivate those children affected, and in this case, it is not clear whether younger or older children would be more affected. All in all, the expected sign of the effect of father's job loss across children of different ages is ambiguous.

The results in Table 2 suggest that the effect of FJL on students that in 2012 were already in post-compulsory education could be positive. Table 12 studies whether there are heterogeneous impacts of FJL on average grades according to the age of the students that in 2012 are still in compulsory education. The results for the restricted sample are presented in the left part of the table (models 1 to 3), whereas the right part of the table shows the results for the restricted sample when those students whose fathers have suffered two job losses in the period are excluded. In each of these models, different definitions are used to capture the potential distinct effects of FJL across different ages. In model 1, the FJL variable is interacted with a dummy equal to 1 for those students that in the last observed academic year, 2012, where in secondary school.[38]

[38]That is, if the student is in Secondary School in 2012 the dummy variable takes on a value of 1 in all five periods.

Although the interaction is not significant, its positive sign could be suggesting that the effect of parental job loss on the average grade is lower for those children that in 2012 were already in secondary school. That is, in line with the results in Table 2, it suggests a lower negative effect of FJL for older students. In the second model, the FJL variable is interacted with the dummy variables for the stage of education the children are enrolled in a particular year. The baseline category is the stage of primary. Again, even though the interaction for both FJL - enrolled in kindergarten and FJL - enrolled in secondary, are statistically insignificant, their sizes suggest that the negative effect of FJL is more detrimental in primary grades. Finally, model 3 interacts the FJL variable with dummies that capture the moment in which FJL happened.[39] In this case, the baseline category captures that father's job loss happened while the student was in primary school. Again though, the interactions are insignificant and would indicate that the timing of parental job loss does not matter. The results excluding those children whose fathers experience more than a job loss in the period are shown in the right part of the table, and are very similar to the ones already described. Also, results using the percentile rank as the dependent variable or for the unrestricted sample are not shown, but the same picture emerges. Even if the evidence in this section does not offer a clear picture, it seems to point towards a more detrimental effect of FJL to be expected, in general, the younger the children are.

In their test for differential effects of FJL on school performance across boys and girls, Rege et al. (2011) find no significant differences among these two groups. However, the difference in the magnitude of estimates suggested a larger negative effect for girls. Even though the interaction is not significant in any of the four cases but one (Table 13, panel 1, model 4), the difference in magnitude in my case suggests rather the contrary. The negative effect of FJL seems to be larger for boys than for girls. The evidence in panel 3 suggests that this differential effect can not be attributed to distinct income changes after job loss for the subsample of boys, since both estimates are negative, statistically significant, and the confidence intervals for the FJL across both subsamples largely overlap.

[39] For instance, if job loss happened while in Secondary School, then FJL happened in Secondary is equal to 1 in all five periods.

Table 13: **Other heterogeneous effects: Sex of the student**

	All sample			Excluding fathers with 2 job losses		
	M.1	M.2	M.3	M.4	M.5	M.6
Panel 1. Dep variable: Average grade						
FJL	-0.184**	-0.251***	-0.033	-0.265***	-0.325***	-0.013
	(0.091)	(0.091)	(0.070)	(0.096)	(0.097)	(0.084)
FJL * Female	0.113			0.217*		
	(0.109)			(0.124)		
Mean	3.706	3.522	3.860	3.678	3.496	3.835
SD	0.839	0.906	0.746	0.855	0.918	0.764
Panel 2. Dep variable: Percentile rank in the year-grade combination						
FJL	-0.055	-0.089**	-0.013	-0.085**	-0.114***	-0.009
	(0.034)	(0.036)	(0.027)	(0.034)	(0.036)	(0.033)
FJL * Female	0.018			0.053		
	(0.041)			(0.046)		
Mean	0.526	0.458	0.582	0.519	0.456	0.574
SD	0.291	0.292	0.279	0.296	0.296	0.285
N	890	405	485	830	385	445
Panel 3. Dep variable: Dummy equal to 1 if father has high income						
FJL	-0.318***	-0.422***	-0.234*	-0.339***	-0.442***	-0.254
	(0.099)	(0.137)	(0.125)	(0.124)	(0.163)	(0.164)
Mean	0.647	0.660	0.635	0.668	0.666	0.669
SD	0.478	0.474	0.482	0.471	0.472	0.471
N	829	385	444	770	365	405
Subsample	All observed	Boys	Girls	All observed	Boys	Girls

FE estimates. Measure 1 of both percentile rank and average grade used. FJL (father's job loss): dummy equal to 1 from the year the father loses the job. Average grade for the whole sample (excluding students in post-compulsory education) has a mean of 3.69 and SD of 0.89. Average percentile rank for the whole sample (excluding students in post-compulsory education) has a mean of 0.50 and SD of 0.28. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the student level (Panel 1 and 2) and at the household level (Panel 3) in parentheses. Panel 1 and 2 extra controls for all models are: year dummies, dummies for stage of education, a dummy for whether the student is re-taking that particular grade, and whether the grades belong to years in this school. Panel 3 extra controls are year dummies. Difference in N between panel 1 and 2, on the one hand, and 3, due to missing observations in father's income.

Other possible mechanisms: occupation status, relocation, civil status changes and mother's changes in the labour market

Following the recent empirical literature on the impact of FJL on school performance, I explore other likely mechanisms by which FJL could be affecting the school performance of their offspring.[40] First, Table 14 shows the effect of FJL on several potential mechanisms. Table 15 shows then the results after re-estimating the original model under different sample restrictions. As Rege et al. (2011) point out, though, the results in Table 15 should be interpreted cautiously because the sample restrictions are likely endogenous to job loss. As in the precedent sections, results in both tables are presented for the whole sample (models 1 to 4), and excluding those children whose fathers experience more than a job loss in the period (models 5 to 8).

[40] I follow closely in this section the empirical strategy used by Rege et al. (2011).

The dependent variable in model 1 is a dummy variable equal to 1 if the father is working in that particular year. There is a consensus among the extensive literature on job displacement on the negative short-run impact of job loss on the re-employment probabilities of the displaced worker (see Table 3 in Kletzer (1998) or the more recent work by Rege et al. (2009) on the impact of job displacement on the disability entry rate in Norway). Given that job loss in my sample is produced in a context of a deep economic recession, the effects of job loss on subsequent employment status are expected to be even more pronounced than those found in the literature. Indeed, the probability that the father is working after job loss decreases by almost 25 percentage points. In model 1 (and 5) in Table 15, I exclude from the analysis those children whose fathers are not back to work in 2012. This sample restriction excludes basically fathers that have suffered from job loss, so a priori, a modest attenuation of the effects on school performance are expected. Applying this restriction barely changes the estimates of FJL on the percentile rank, and decreases modestly the estimates of FJL on the average grade (and makes them more imprecise). This latter finding for the average grade would in line with the analysis in Section 2.5.1, that finds that the effect of the negative effect of the FJL variable is mainly driven by those students whose fathers suffer long unemployment spells after job loss.

Table 14: **Other possible mechanisms: effects of FJL on other variables**

	Restricted sample				Rest sample, excluding fathers with 2 job losses			
	M.1	M.2	M.3	M.4	M.5	M.6	M.7	M.8
Dep variable:	Father working	Moved in the year	Stable civil status	Mother working	Father working	Moved in the year	Stable civil status	Mother working
FJL	-0.249***	-0.040	-0.009	-0.111*	-0.284***	-0.049	-0.009	-0.143*
	(0.066)	(0.033)	(0.006)	(0.061)	(0.064)	(0.042)	(0.006)	(0.074)
Mean	0.946	0.019	0.956	0.789	0.951	0.021	0.953	0.779
SD	0.226	0.138	0.205	0.409	0.217	0.143	0.212	0.415
N	890	880	890	889	830	820	830	829

FE estimates. FJL (father's job loss): dummy equal to 1 from the year the father loses the job. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the household level in parentheses. All models include year dummies. Dependent variables are, respectively, dummy variables equal to 1 if the father is working, the family has changed residence in the year, the civil status of the parents is classified as stable (married or living together), and the mother is working.

The recent literature on the effects of parental job loss on the educational outcomes of their offspring often analyses whether those parents suffering job loss have a higher likelihood of residential mobility or marriage dissolution, since both events might be associated with poorer educational outcomes. I find no significant effects of FJL on a dummy variable that equals 1 if the family has changed its residence during that particular year (Table 14, model 2 and 6).[41] Excluding from the main model those observations of children that suffered residential reloca-

[41]Results hold if a dummy variable that equals 1 from the year the household moves, is used as a dependent variable instead.

tion in the period under observation (Table 15, models 2 and 6), the estimates of FJL on school performance decrease modestly and become slightly more imprecise, but the main conclusions hold. Eliason (2012) and Charles and Stephens (2004) document an excess risk of divorce among couples in which the husband was displaced in Sweden, and the spousal in the US, respectively. I find no significant effect on the civil status of parents after FJL in my sample. Accordingly, after restricting the sample to those children whose parents do not experience any civil status change during the period of observation, the estimates of FJL on school performance barely change. However, as Piketty (2003) results suggest, it is parental conflicts (rather than separation/divorce per se) that are bad for children and, in particular, for their school performance. Unfortunately, there is no variable in my sample to measure the level of conflict between the parents in order to assess its role as a potential mechanism behind the effect of FJL on school performance.

Lastly, I analyse whether there is an effect on the employment status of the mother after FJL. My results contrast with those obtained by Rege et al. (2011). Instead of increasing their participation in the labour market, during the Great Recession in Spain mothers experience a significant decrease in the probability of being employed of 11 percentage points after the father loses the job. In fact, a measure of mother's job loss constructed in the same fashion as the FJL measure, displays a correlation in 2012 of 0.2 in the sample of 178 students considered. However, restricting the sample to those children whose mothers did not suffer any labour situation change, the estimates of FJL on school performance decrease only modestly and the results earlier in the chapter showed that when both father's and mother's job loss are introduced in the model, the father's job loss coefficient retains its sign and magnitude, whereas the mother's job loss one is not statistically different from zero in any of the subsamples. Thus, the evidence does not suggest that maternal labour status changes could be one of the main drivers of the effect of FJL on school performance.

Table 15: **Other possible mechanisms: Effects of FJL on percentile rank and average grades. Sample restrictions**

	Restricted sample				Rest sample, excluding fathers with 2 job losses			
	M.1	M.2	M.3	M.4	M.5	M.6	M.7	M.8
Panel 1. Dep variable: Average grade								
FJL	-0.088	-0.093	-0.118**	-0.094	-0.094	-0.110	-0.142**	-0.124
	(0.063)	(0.060)	(0.057)	(0.089)	(0.073)	(0.072)	(0.066)	(0.093)
Mean	3.726	3.751	3.701	3.752	3.716	3.721	3.671	3.736
SD	0.832	0.810	0.842	0.814	0.842	0.829	0.858	0.821
N	790	765	880	595	760	705	820	575
Panel 2. Dep variable: Percentile rank in the year-grade combination								
FJL	-0.044*	-0.036	-0.043**	-0.034	-0.055*	-0.044	-0.054**	-0.043
	(0.026)	(0.024)	(0.022)	(0.035)	(0.029)	(0.028)	(0.025)	(0.036)
Mean	0.541	0.541	0.523	0.549	0.539	0.535	0.517	0.546
SD	0.290	0.284	0.292	0.290	0.292	0.290	0.297	0.293
N	790	765	880	595	760	705	820	575
Sample restriction	Father working in 2012	Not moving in the period	Stable civil status	Mother: no labour status change	Father working in 2012	Not moving in the period	Stable civil status	Mother: no labour status change

FE estimates. Measure 1 of both percentile rank and average grade used. FJL (father's job loss): dummy equal to 1 from the year the father loses the job. Grade percentile rank for the entire population of 408 students available has mean 0.5 and SD of 0.28. Average grade for the entire population of 408 students available has mean 3.69 and SD of 0.89. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the student level in parentheses. Extra controls for all models are: year dummies, dummies for stage of education, a dummy for whether the student is re-taking that particular grade, and whether the grades belong to years in this school.

2.6 Conclusion

This chapter studies whether the detrimental effects of job loss go beyond the affected worker. In particular, this article assesses the impact of father's job loss on the school performance of their offspring during the Great Recession in Spain. In a simple one period static model in which children decide the level of effort they exert at school each academic year, and effort positively influences school performance, parental job loss is assumed to affect both the marginal returns and marginal costs of effort, by making children more or less productive while studying, and altering their incentives to study. Therefore, the impact of parental job loss on school performance is not clear from a theoretical perspective. The data collected and the estimation strategy followed in this chapter have allowed me to estimate the total effect of an exogenous change in parental job loss on the educational performance of their offspring. That is, not holding other inputs constant.

As Rege et al. (2011) point out, estimating a causal relationship between parental job loss and child outcomes faces two main challenges: concerns of omitted variable data and the scarcity of appropriate data. This chapter has addressed both of them by exploiting the recent developments in the Spanish labour market and by using a panel dataset specifically designed to address this question. Thus, the empirical strategy followed in this article has relied on the fact that, conditioning on student fixed effects and observed covariates, the Great Recession in Spain generates variation in job loss analogous to that provided by randomisation.

The results in this chapter imply that father's job loss entails a yearly average decrease in children's average grades of about 13.2 to 16% of the population standard deviation after job loss, and a reduction of about 15.7 to 19.6% of the population standard deviation in the percentile rank measure. Compared to Rege et al. (2011), that find an effect of father's plant closure on average GPA of 16 year olds of about 6.3% of the population standard deviation, the results in my case show that the effects of father's job loss on the average grade of their offspring during a deep economic crisis (for children aged 8 to 17) are bigger in magnitude. Moreover, given the panel nature of my data, I can show that school performance prior to father's job loss is not affected by future job losses. Additionally, the negative effect of FJL does not seem to be driven by those students whose fathers had lower tenure at the firm prior to job loss, but rather, by those fathers that had a more stable situation prior to losing the job. This evidence would suggest that treated students were not on a different (negative) trend prior to father's job loss. This evidence would be suggesting a causal link between father's job loss and children's educational outcomes. Rege et al. (2011) compare their estimates with the results summarised by Hanushek (2006) about the STAR experiment. Hanushek (2006) notes that large class size reductions of around 8 students are necessary in order to increase students' achievement by 20% of the standard deviation. Thus, the effects of father's job loss on the school performance of their offspring during the economic recession in Spain are not negligible. Moreover, the results suggest that the negative impact of father's job loss in school performance is mainly driven by those fathers that suffer longer unemployment spells. Importantly, these results are pointing out a mechanism through which further inequalities in the Spanish society might develop during and after a deep economic crisis.

In this respect, the effect of father's job loss appears to be largely concentrated among children of already disadvantaged families in terms of the level of education of the father. This result doesn't seem to be fully explained by different income losses, and it can partly be explained by a higher probability of finding a job after job loss, for those fathers with a high level of education. Also, even though imprecise, the results seem to be larger for those children whose father closed his own business after 2008, and more concentrated on boys rather than on girls. Even if in the whole sample father's job loss is associated with a significant decrease in income, these differential effects do not seem to be driven by changes in income. Thus, I find no clear evidence supporting the hypothesis that income could be the main mechanism behind the effect of father's job loss on school performance.

Like Rege et al. (2011) and Stevens and Schaller (2011), I also find that residential relocation or changes in civil status are not the main drivers of the effect of father's job loss on the

school performance of their offspring. Interestingly, I find that mothers experience a significant decrease in the probability of being employed after the father loses the job. However, restricting the sample to those children whose mothers did not suffer any labour situation change, the estimates of father's job loss on school performance decrease only modestly. Additionally, the effect of father's job loss retain its sign and magnitude after controlling for mother's job loss whereas the effect of mother's job loss on school performance is not significant. Thus, mother labour status changes do not seem to be behind the effect of father's job loss either. These results are in line with those found by Rege et al. (2011) that argue that a disparate effect of job loss across fathers and mothers is consistent with recent empirical studies documenting that the mental distress experienced by displaced workers is generally more severe for men than women.

One of the mechanisms that had not been addressed so far in the literature are the changes in motivation at the workplace after job loss (for those fathers who were able to find a job after job loss). I find that fathers who were highly motivated in their jobs in 2008, suffer a significant reduction in their level of motivation in their new jobs, once job loss occurs. On the contrary, fathers who were less motivated at work in 2008 increase significantly their level of motivation at work after job loss. And even though the estimates are imprecise, the effect of father's job loss seems to be larger for those children whose fathers were highly motivated previous to job loss. These results would be in line with the theories of the social psychologists, that argue that after job loss, workers have prevalent feelings of job insecurity, and job loss leaves them anxious, angry and demoralised (Barling et al., 1999b), and these negative feelings and mood could, in turn, affect the school performance of their offspring. Moreover, given the negative effects on mood that job loss carries for the worker, it is likely that parental conflict increases after job loss. As Piketty (2003) results suggest, it is parental conflicts (rather than separation/divorce per se) that are bad for children and, in particular, for their school performance. Unfortunately, there is no variable in my sample to measure the level of conflict between the parents, but future research should assess this channel.

One of the advantages of working with this particular sample is that students are enrolled in the same school during the period of observation. This means that, under the assumption that the school does not react to parental job loss, there is no differential change in the level of school inputs between treated and control students during the whole period. The driving mechanisms behind the negative effect of father's job loss have to be found, therefore, at the family level. In light of the simple theoretical model described above, and even if more data is needed in order to disentangle the mechanisms behind the negative effect of father's job loss, the results here and in the related literature seem to suggest that, in general, there could be a decrease in the return to effort after parental job loss that is not compensated by a decrease in the marginal costs of effort.

Given the current massive employment destruction that has been taking place in several advanced economies after the Great Recession, the present study wants to contribute to underline the importance of understanding the mechanisms behind the negative and sizable effect of father's job loss on children's school performance. Besides the importance of the question in terms of granting equality of opportunity to individuals in society, there are also important implications for the economy as a whole, given the paramount importance of human capital for economic growth.

2.7 Appendix

Table A1: **Descriptive statistics. Children characteristics in 2008**

	Control	Treated	Total	Diff and t-test
Born Q1	0.242	0.185	0.225	0.0568
	(0.430)	(0.392)	(0.419)	(0.83)
Born Q2	0.298	0.241	0.281	0.0576
	(0.459)	(0.432)	(0.451)	(0.78)
Born Q3	0.274	0.407	0.315	-0.133*
	(0.448)	(0.496)	(0.466)	(-1.77)
Born Q4	0.185	0.167	0.180	0.0188
	(0.390)	(0.376)	(0.385)	(0.30)
Female	0.524	0.593	0.545	-0.0684
	(0.501)	(0.496)	(0.499)	(-0.84)
Ever repeated	0.0403	0.0556	0.0449	-0.0152
a grade	(0.198)	(0.231)	(0.208)	(-0.45)
Age	8.306	8	8.213	0.306
	(2.697)	(2.503)	(2.636)	(0.71)
Periods in	4.976	4.944	4.966	0.0314
school	(0.154)	(0.231)	(0.181)	(0.91)
N	124	54	178	

First line for each variable corresponds to its mean. Standard errors in parentheses. *, **, *** denote significance at the 10%, 5% and 1% levels. The 4th column shows the difference in means for treated and control individuals, and in parentheses, the value of the t-stat for the test of equality of means.

Table A2: **Descriptive statistics. Household characteristics in 2008**

	Control	Treated	Total	Diff and t-test
Number of children	1.976	2.111	2.017	-0.135
	(0.517)	(0.744)	(0.596)	(-1.21)
Household size	3.927	4.056	3.966	-0.128
	(0.528)	(0.787)	(0.619)	(-1.09)
Stable civil status	0.960	0.926	0.949	0.0338
	(0.198)	(0.264)	(0.220)	(0.84)
House: Owned	0.395	0.389	0.393	0.00627
	(0.491)	(0.492)	(0.490)	(0.08)
House: Paying mortgage	0.573	0.481	0.545	0.0911
	(0.497)	(0.504)	(0.499)	(1.12)
House: Rented	0.0161	0.0926	0.0393	-0.0765*
	(0.126)	(0.293)	(0.195)	(-1.85)
Moved in 2008-2012	0.137	0.115	0.131	0.0217
	(0.345)	(0.323)	(0.338)	(0.39)
Postcode 1	0.0484	0	0.0337	0.0484**
	(0.215)	(0)	(0.181)	(2.50)
Postcode 2	0.105	0.0741	0.0955	0.0308
	(0.308)	(0.264)	(0.295)	(0.64)
Postcode 3	0.637	0.648	0.640	-0.0111
	(0.483)	(0.482)	(0.481)	(-0.14)
Postcode 4	0.121	0.167	0.135	-0.0457
	(0.327)	(0.376)	(0.343)	(-0.77)
Postcode 5	0.0887	0.111	0.0955	-0.0224
	(0.285)	(0.317)	(0.295)	(-0.45)
N	124	54	178	

First line for each variable corresponds to its mean. Standard errors in parentheses. *, **, *** denote significance at the 10%, 5% and 1% levels. The 4th column shows the difference in means for treated and control individuals, and in parentheses, the value of the t-stat for the test of equality of means.

Table A3: **Descriptive statistics. Father characteristics in 2008**

	Control	Treated	Total	Diff and t-test
Education	0.419	0.315	0.388	0.105
beyond High-School	(0.495)	(0.469)	(0.489)	(1.32)
Age	40.80	41.96	41.15	-1.165
	(4.788)	(4.526)	(4.728)	(-1.52)
High income	0.765	0.563	0.706	0.203***
	(0.426)	(0.501)	(0.457)	(2.63)
	115	48	163	
Income missing	0.0726	0.111	0.0843	-0.0385
	(0.260)	(0.317)	(0.279)	(-0.78)
Labour market characteristics				
Own business	0.242	0.315	0.264	-0.0729
	(0.430)	(0.469)	(0.442)	(-1.01)
Industry	0.250	0.413	0.296	-0.163**
	(0.435)	(0.498)	(0.458)	(-2.06)
	116	46	162	
Construction	0.155	0.370	0.216	-0.214***
	(0.364)	(0.488)	(0.413)	(-2.70)
	116	46	162	
Tenure since	1994.4	1998.6	1995.7	-4.213***
	(6.875)	(6.769)	(7.095)	(-3.78)
Permanent contract	0.989	0.714	0.915	0.275***
	(0.103)	(0.458)	(0.280)	(3.52)
	94	35	129	
Private sector	0.915	1	0.939	-0.0847***
	(0.280)	(0)	(0.239)	(-3.29)
	118	47	165	
Full time work	0.974	0.911	0.957	0.0632
	(0.159)	(0.288)	(0.204)	(1.39)
	117	45	162	
Big firm	0.448	0.152	0.364	0.296***
	(0.499)	(0.363)	(0.483)	(4.18)
	116	46	162	
High motivation	0.784	0.696	0.758	0.0881
	(0.414)	(0.465)	(0.430)	(1.17)
	111	46	157	

First line for each variable corresponds to its mean. Standard errors in parentheses. *, **, *** denote significance at the 10%, 5% and 1% levels. The 4th column shows the difference in means for treated and control individuals, and in parentheses, the value of the t-stat for the test of equality of means. A third row with the number of observations is shown in the case that a particular variable has missing values.

Table A4: **Characteristics of treated fathers in the first and second period after job loss. Unrestricted sample**

	2009-2010	2011-2012	All FJL	Diff and t-test
Father educ	0.345	0.200	0.301	0.145
beyond HS	(0.479)	(0.408)	(0.462)	(1.32)
	58	25	83	
Father's age	41.17	41.88	41.39	-0.708
	(4.593)	(6.882)	(5.351)	(-0.47)
	58	25	83	
Father works in	0.759	0.680	0.735	0.0786
a firm in 2008	(0.432)	(0.476)	(0.444)	(0.74)
	58	25	83	
Industry (2008)	0.415	0.333	0.390	0.0818
	(0.497)	(0.482)	(0.491)	(0.67)
	53	24	77	
Construction (2008)	0.302	0.458	0.351	-0.156
	(0.463)	(0.509)	(0.480)	(-1.33)
	53	24	77	
Services (2008)	0.283	0.208	0.260	0.0747
	(0.455)	(0.415)	(0.441)	(0.69)
	53	24	77	

First line for each variable corresponds to its mean. Standard errors in parentheses. *, **, *** denote significance and the 10%, 5% and 1% levels. The 4th column shows the difference in means for treated and control, and in parentheses, the value of the t-stat for the test of equality of means. The third row shows the number of observations. There are 6 missing values in the dummy variables containing information on the sector of activity.

Table A5: **Robustness check: average effect of FJL on average grade and percentile rank (type 2 measure)**

	Dep variable: Average grade		Dep variable: Percentile rank	
	M.1	M.2	M.3	M.4
FJL	-0.104	-0.135*	-0.041*	-0.055**
	(0.064)	(0.072)	(0.024)	(0.027)
Mean	3.647	3.620	0.526	0.519
SD	0.835	0.850	0.292	0.297
N	890	830	890	830
Students (groups)	178	166	178	166
Subsample	Rest	Rest	Rest	Rest
		Exclude 2JL		Exclude 2JL

FE estimates. FJL (father's job loss): dummy equal to 1 from the year the father loses the job. Average grade for the whole sample (excluding students in post-compulsory education) has a mean of 3.58 and SD of 0.86. Average percentile rank for the whole sample (excluding students in post-compulsory education) has a mean of 0.50 and SD of 0.28. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the student level in parentheses. All models include year dummies, and dummies for stage of education, indicators for whether the student is re-taking that particular grade, and whether the average grades belong to classes taken in the school where the survey was distributed. Definitions of subsamples explained in the text.

Table A6: **Average effect of FJL on the average grade and percentile rank. Random Effects**

	Dep variable: Average grade				Dep variable: Percentile rank			
	M.1	M.2	M.3	M.4	M.5	M.6	M.7	M.8
FJL	-0.102*	-0.106*	-0.135**	-0.136**	-0.039*	-0.041*	-0.052**	-0.052**
	(0.057)	(0.057)	(0.067)	(0.065)	(0.021)	(0.021)	(0.024)	(0.023)
Female		0.374***		0.384***		0.137***		0.136***
		(0.107)		(0.113)		(0.038)		(0.040)
Born Q1		0.551***		0.539***		0.213***		0.206***
		(0.166)		(0.173)		(0.058)		(0.061)
Born Q2		0.205		0.169		0.069		0.055
		(0.165)		(0.174)		(0.058)		(0.062)
Born Q3		0.340**		0.335**		0.125**		0.126**
		(0.155)		(0.161)		(0.054)		(0.056)
Father educ		0.349***		0.344***		0.138***		0.136***
beyond HS		(0.109)		(0.118)		(0.040)		(0.044)
Mean	3.706	3.706	3.678	3.678	0.526	0.526	0.519	0.519
SD	0.839	0.839	0.855	0.855	0.291	0.291	0.296	0.296
N	890	890	830	830	890	890	830	830
Students	178	178	166	166	178	178	166	166
Subsample	Rest	Rest	Rest Exclude 2JL	Rest Exclude 2JL	Rest	Rest	Rest Exclude 2JL	Rest Exclude 2JL

RE estimates. FJL (father's job loss): dummy equal to 1 from the year the father loses the job. Average grade for the whole sample (excluding students in post-compulsory education) has a mean of 3.69 and SD of 0.89. Average percentile rank for the whole sample (excluding students in post-compulsory education) has a mean of 0.50 and SD of 0.28. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the student level in parentheses. All models include year dummies, and dummies for stage of education, indicators for whether the student is re-taking that particular grade, and whether the average grades belong to classes taken in the school where the survey was distributed. Definitions of subsamples explained in the text.

Table A7: **Robustness check: Average effect of father's job loss on the average grade and percentile rank. Different treatment definitions**

	Dep variable: Average grade				Dep variable: Percentile rank			
	M.1	M.2	M.3	M.4	M.5	M.6	M.7	M.8
FJL (1)	-0.079*		-0.096		-0.032*		-0.029	
	(0.048)		(0.061)		(0.017)		(0.022)	
FJL (2)		-0.241***		-0.291***		-0.086***		-0.079**
		(0.081)		(0.100)		(0.030)		(0.039)
Mean	3.706	3.706	3.678	3.678	0.526	0.526	0.519	0.519
SD	0.839	0.839	0.855	0.855	0.291	0.291	0.296	0.296
N	890	890	830	830	890	890	830	830
Students	178	178	166	166	178	178	166	166
Subsample	Rest	Rest	Rest Exclude 2JL	Rest Exclude 2JL	Rest	Rest	Rest Exclude 2JL	Rest Exclude 2JL

FE estimates. FJL (1): dummy equals 1 the year the father loses the job and the years after job loss as long as the father remains unemployed. FJL(2): dummy equals 1 the year the father loses the job (as long as he does not find a job the same year), and the years after job loss as long as the father remains unemployed. Average grade for the whole sample (excluding students in post-compulsory education) has a mean of 3.69 and SD of 0.89. Average percentile rank for the whole sample (excluding students in post-compulsory education) has a mean of 0.50 and SD of 0.28. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the student level in parentheses. All models include year dummies, and dummies for stage of education, indicators for whether the student is re-taking that particular grade, and whether the average grades belong to classes taken in the school where the survey was distributed. Definitions of subsamples explained in the text.

Table A8: **Average effect of MJL on the average grade and percentile rank**

	Dep variable: Average grade		Dep variable: Percentile rank	
	M.1	M.2	M.3	M.4
MJL	-0.040	-0.057	-0.017	-0.029
	(0.085)	(0.092)	(0.030)	(0.032)
Mean	3.702	3.723	0.528	0.535
SD	0.841	0.826	0.291	0.289
N	835	820	835	820
Students (groups)	167	164	167	164
Subsample	Rest	Rest	Rest	Rest
		Exclude 2JL		Exclude 2JL

FE estimates. MJL (mother's job loss): dummy equal to 1 from the year the mother loses the job. Average grade for the whole sample (excluding students in post-compulsory education) has a mean of 3.69 and SD of 0.89. Average percentile rank for the whole sample (excluding students in post-compulsory education) has a mean of 0.50 and SD of 0.28. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the student level in parentheses. All models include year dummies, and dummies for stage of education, indicators for whether the student is re-taking that particular grade, and whether the average grades belong to classes taken in the school where the survey was distributed. Definitions of subsamples explained in the text.

Table A9: **Robustness check: average effect of FJL on the average grade and percentile rank (3 periods: 2008, 2010, 2012)**

	Dep variable: Average grade		Dep variable: Percentile rank	
	M.1	M.2	M.3	M.4
FJL	-0.171***	-0.185**	-0.057**	-0.064**
	(0.062)	(0.073)	(0.026)	(0.028)
Mean	3.736	3.707	0.527	0.521
SD	0.853	0.869	0.294	0.299
N	534	498	534	498
Students (groups)	178	166	178	166
Subsample	Rest	Rest	Rest	Rest
		Exclude 2JL		Exclude 2JL

FE estimates. FJL (father's job loss): dummy equal to 1 from the year the father loses the job. Average grade for the whole sample (excluding students in post-compulsory education) has a mean of 3.69 and SD of 0.89. Average percentile rank for the whole sample (excluding students in post-compulsory education) has a mean of 0.50 and SD of 0.28. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the student level in parentheses. All models include year dummies, and dummies for stage of education, indicators for whether the student is re-taking that particular grade, and whether the average grades belong to classes taken in the school where the survey was distributed. Definitions of subsamples explained in the text.

Table A10: **Robustness check: excluding outliers**

	Dep variable: Average grade				Dep variable: Percentile rank			
	Excl 1st and 99th perc		Excl 5th and 95th perc		Excl 1st and 99th perc		Excl 5th and 95th perc	
	M.1	M.2	M.3	M.4	M.5	M.6	M.7	M.8
FJL	-0.137**	-0.164**	-0.146***	-0.179***	-0.042*	-0.052**	-0.044**	-0.054**
	(0.056)	(0.066)	(0.050)	(0.057)	(0.021)	(0.024)	(0.022)	(0.025)
Mean	3.732	3.705	3.793	3.768	0.531	0.525	0.552	0.545
SD	0.823	0.839	0.796	0.814	0.289	0.294	0.286	0.291
N	870	810	800	740	870	810	800	745
Students (groups)	174	162	160	148	174	162	160	149
Subsample	Rest	Rest-Excl 2JL	Rest	Rest-Excl 2JL	Rest	Rest-Excl 2JL	Rest	Rest-Excl 2JL
Fixed effects and controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

FJL (father's job loss): dummy equal to 1 from the year the father loses the job. Average grade for the whole sample (excluding students in post-compulsory education) has a mean of 3.69 and SD of 0.89. Average percentile rank for the whole sample (excluding students in post-compulsory education) has a mean of 0.50 and SD of 0.28. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the student level in parentheses. All models include year dummies, and dummies for stage of education, indicators for whether the student is re-taking that particular grade, and whether the average grades belong to classes taken in the school where the survey was distributed. Definitions of subsamples explained in the text.

Table A11: **Robustness check: peer effects in the classroom**

	Dep variable: Average grade				Dep variable: Percentile rank			
	M.1	M.2	M.3	M.4	M.5	M.6	M.7	M.8
FJL	-0.105*	-0.130*	-0.108*	-0.128*	-0.049**	-0.058**	-0.050**	-0.058**
	(0.058)	(0.066)	(0.059)	(0.068)	(0.022)	(0.024)	(0.023)	(0.026)
% FJL in grade-year	-0.005	-0.006			0.002	0.001		
	(0.004)	(0.004)			(0.001)	(0.001)		
% FJL in grade-class-year			-0.001	-0.002			0.001	0.000
			(0.001)	(0.001)			(0.000)	(0.000)
Mean	3.706	3.678	3.706	3.678	0.526	0.519	0.526	0.519
SD	0.839	0.855	0.839	0.855	0.291	0.296	0.291	0.296
N	890	830	890	830	890	830	890	830
Students (groups)	178	166	178	166	178	166	178	166
Subsample	Rest	Rest-Excl 2JL	Rest	Rest-Excl 2JL	Rest	Rest-Excl 2JL	Rest	Rest-Excl 2JL
Fixed effects and controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

FJL (father's job loss): dummy equal to 1 from the year the father loses the job. Average grade for the whole sample (excluding students in post-compulsory education) has a mean of 3.69 and SD of 0.89. Average percentile rank for the whole sample (excluding students in post-compulsory education) has a mean of 0.50 and SD of 0.28. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the student level in parentheses. All models include year dummies, and dummies for stage of education, indicators for whether the student is re-taking that particular grade, and whether the average grades belong to classes taken in the school where the survey was distributed. Definitions of subsamples explained in the text.

Table A12: **Average effect of getting back to work for the offspring of fathers losing the job**

	Dep variable: Average grade		Dep variable: Percentile rank	
	M.1	M.2	M.3	M.4
Back to work	0.011	-0.060	0.052*	0.030
	(0.073)	(0.132)	(0.029)	(0.054)
Mean	3.761	3.658	0.561	0.536
SD	0.667	0.727	0.250	0.269
N	146	105	146	105
Students	42	30	42	30
Subsample	Rest	Rest	Rest	Rest
		Exclude 2JL		Exclude 2JL

FE estimates. Back to work: equals 1 for the periods the father is back to work, and equals 0 the year of job loss, and those years that the father remains unemployed after job loss. Average grade for the whole sample (excluding students in post-compulsory education) has a mean of 3.69 and SD of 0.89. Average percentile rank for the whole sample (excluding students in post-compulsory education) has a mean of 0.50 and SD of 0.28. *, **, *** denote significance at the 10%, 5% and 1% levels. Clustered robust standard errors at the student level in parentheses. All models include year dummies, and dummies for stage of education. Definitions of subsamples explained in the text.

Table A13: **Probability of finding a job**

	M.1	M.2	M.3
Spanish	1.800*	1.680*	2.347***
	(0.558)	(0.514)	(0.591)
Educ beyond HS	2.426**	2.341**	3.116***
	(1.038)	(0.984)	(0.931)
Age more than 45	0.551*	0.560*	0.508***
	(0.179)	(0.181)	(0.132)
Industry	0.620		
	(0.221)		
Construction	0.243***	0.277***	
	(0.086)	(0.093)	
Mean	0.543	0.543	0.361
SD	0.499	0.499	0.481
Pseudo-R2	0.106	0.100	0.076
N	311	311	451

Dep var: = 1 if individual has started working in the firm in the last 12 months or has already found a job; and 0 if the individual is unemployed. Data comes from 1Q 2012 of the Spanish LFS available online (www.ine.es). Sector of activity variables are defined according to the sector in the current job or sector of last employment and it is only defined if the individual has been unemployed for less than a year. The table presents odd-ratios and standard errors (in parentheses). Weights used.

Chapter 3

From Dual Labour Markets to School Outcomes: Parents' Contracts and Compulsory Education Completion in Spain

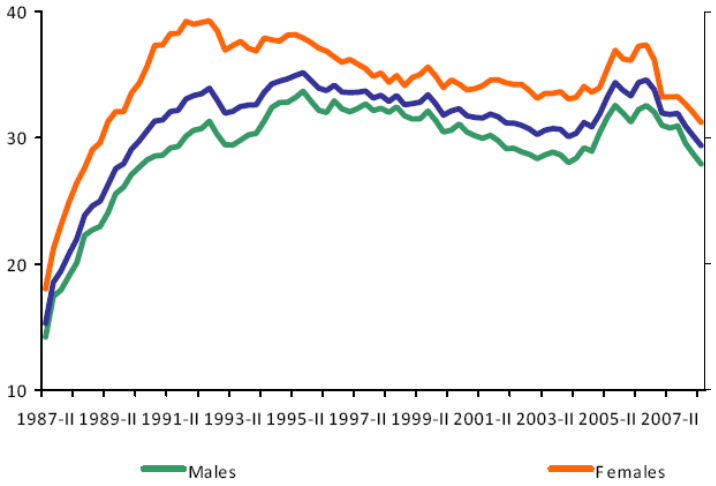
3.1 Introduction

After the reforms that took place in the 1980's as a way to introduce flexibility in some European labour markets, the Spanish economy became an extreme example of the development of a dual labour market.[1] As can be seen in Figure 1, temporary employment rates expanded dramatically in the 80's. From around 15% in 1987 (there is no data before that year), the average rate of temporary contracts for both men and women increased until it reached over 30% of the contracts in the early 90's, and remained well over 30% until the beginning of the Great Recession.

Given the negative effects associated to temporary contracts elsewhere in the literature, this chapter analyses whether the probability of on-time compulsory education completion is affected by parents' contractual arrangement in the labour market. Bentolila et al. (2008) and Dolado et al. (2002) review the empirical literature on the different consequences of temporary contracts both at the macro and the microeconomic level, and note that several studies have found that temporary workers receive less investment in on-the-job training and lower wages, after controlling for observed skills, occupation, and firm effects. Moreover, according to their review, the evidence also indicates that this wage gap between permanent and temporary workers is associated with employers' decisions to under-classify temporary workers when assigning them to occupational categories. There's also evidence suggesting that temporary contracts increase work accidents (Guadalupe, 2003) and Booth et al. (2002) show that workers holding temporary contracts have a lower level of job satisfaction. Besides these effects on temporary workers, earlier evidence has found additional impacts on other family members and family decisions. For instance, Barceló and Villanueva (2010) find that households in which the main income earner has a temporary contract, devote up to a 30% of their annual wages to accumulate a higher level of wealth (by reducing consumption) than those households in which the main income earner has a permanent contract. De la Rica and Iza (2005) find that men under temporary contracts delay marriage decisions and childless women holding fixed-term contracts postpone entry into

[1] See the next section and the papers by Dolado et al. (2002) and Bentolila et al. (2008) for a description of employment protection legislation in Spain.

Figure 1: Temporary employment rates in Spain (%), from Bentolila et al. (2008)



motherhood. Using micro evidence for young people in Italy in the mid-90's, Becker et al. (2010) show that the probability of moving out increases in paternal job insecurity and decreases in children's job insecurity.

A strand of literature in the social psychology field suggests that the effects of job insecurity go beyond the insecure employee and affect negatively the school outcomes of their offspring.[2] Together with the empirical literature in economics reviewed above, this suggests several mechanisms by which the type of contract held by the father could affect the educational outcomes of children. First, several of the consequences of temporary contracts mentioned earlier in the text affect variables (i.e. parental income, job satisfaction and health, among others) that are traditionally seen as inputs of the grade production function or school performance of students. Second, as the social psychologists point out, parental job insecurity can affect student's self-efficacy and work attitudes in a negative way (Lim and Loo, 2003).

This chapter examines the impact of paternal job insecurity on students' probability of graduating from compulsory education on time, using data from the Spanish Labour Force Survey. As Pinger (2013), this chapter focus on the paternal impact because the father tends to be the main breadwinner and because psychological effects of job insecurity tend to be higher for men than for women (Lim and Sng, 2006). A major concern for identification in this chapter is that the type of contract held by the father and the probability of on-time compulsory school

[2]Barling et al. (1999b) find that children who perceive their parents to be insecure about their jobs are distracted cognitively and Barling et al. (1999a) present evidence that parental job insecurity affects children's beliefs in an unjust world and mood, which in turn, the authors show to affect school performance.

completion might be jointly determined and dependent on unobservables. This concern is addressed by using an estimation strategy that relies on exogenous variation in regional labour market policies in Spain to identify the causal effect of interest. From 1997, several regions in Spain implemented policies that subsidised firms hiring workers using open-ended (permanent) contracts. Not all regional governments decided to implement them, and among those regional governments that designed subsidies to foster permanent employment, the amount of the subsidy varied among different demographic groups. Following Barceló and Villanueva (2010), I use this variation across regions, time and age of the father at the time of hiring, to construct an instrument for the contract type held by the father. Average marginal effects and local average treatment effects (LATE) are estimated. Results indicate that students whose fathers hold a permanent contract (as opposed to a temporary, fixed-term contract) the year they should graduate from compulsory education are, on average, 7 percentage points more likely to graduate on time. LATE estimates are considerably higher, suggesting that those students whose fathers obtained a permanent contract as a result of the availability of subsidies, reaped bigger benefits from paternal job stability. These results hold when maternal job insecurity is also accounted for, and they are concentrated on male students.

To the best of my knowledge, this is the first work that tries to identify the causal effect of paternal contractual form on children school outcomes. Individuals constrained by temporary employment often suffer unemployment spells. Therefore, the fact that an individual of a certain age holds a temporary contract the year one of his offspring turns 16, might be reflecting a rather long term experience of job insecurity.[3] As a result, this chapter is certainly linked to the literature analysing the effect of parental unemployment on the school outcomes of children. A recent paper in this literature is the one by Pinger (2013), that finds that shifts in paternal unemployment produced by variations in the cyclical component of regional adult male unemployment decreases the probability of upper secondary schooling choice by around 18 percentage points.[4] Other papers have used plant closures as a way to identify the impact of paternal job loss on school outcomes (see Rege et al. (2011) or Stevens and Schaller (2011), for instance).

The contribution of this chapter is threefold. First, as mentioned earlier in the text, this is the first work that attempts to identify the link between father's job insecurity (measured by the type of contract held by fathers) and on-time compulsory school completion (or any educational outcome in general). Second, it uses an identification strategy that had only been used previously to identify a rather different effect (wealth holdings of temporary workers), and

[3] A key control variable in all the estimations in the chapter is a third order polynomial in tenure that, according to Barceló and Villanueva (2010) produces similar results to the use of tenure fixed effects.

[4] See Pinger (2013) for an extensive section reviewing the literature on paternal unemployment and child outcomes.

that allows to plausibly identify the causal impact of the variable of interest. Third, following related literature on the effects of paternal unemployment and job loss, I study a variety of heterogeneous effects not addressed before for this particular research question.

This chapter is organised as follows. Section 3.2 describes the institutional labour market framework in Spain. Section 3.3 describes the data and Section 3.4 discusses the estimation strategy. Section 3.5 presents the results and Section 3.6 offers a discussion of the potential mechanisms behind the effect of paternal contractual type on on-time compulsory school graduation.

3.2 The Spanish labour market: Institutional framework

The labour reform that took place in Spain in 1984 liberalised the use of temporary contracts to all type of jobs and established a maximum length of 3 years for this type of contracts. Under that law, the main difference between a temporary and a permanent contract in Spain was given by the differences in firing costs between temporary and permanent workers. Whereas permanent workers received an indemnity of 20 or 45 days of wages per year worked for fair and unfair dismissals, respectively; workers under temporary contracts received a mandatory severance payment of 12 days of wages per year worked. Moreover, this could not be appealed in labour courts, and if the worker reached the end of her contract length, she had no right to perceive any kind of indemnity (i.e., if an employer wanted to fire a temporary worker at no cost, she just had to wait until the end of the temporary contract).[5]

After the dramatic increase in temporary contracts that followed the 1984 reform, several national reforms in the 1990's and early 2000's tried to reverse the situation. A description of these reforms can be found in Mendez (2013) and is summarised here. In 1994, a national reform restored the principle of causality in the application of temporary contracts. But as Mendez (2013) notes, the restrictions imposed by this new law on the use of the non-causal temporary contract led to a greater use of other types of temporary contracts rather than encouraging the use of permanent ones. Following the failure of the 1994 reform, in 1997 the new conservative

[5]The unemployment insurance that a worker receives when entering unemployment is not defined on the basis of the type of contract held. However, there are several requirements that could lead workers under a temporary contract to receive, on average, a lower and shorter subsidy. Starting with the reform of 1992, a worker in Spain is entitled to receive unemployment benefits as long as she has worked more than 360 days during the prior 6 years (not necessarily for the same firm). Moreover, the duration of the unemployment benefits depends on tenure prior to job loss and the amount received also varies with the wage prior to job loss. In this sense, if workers under a temporary contract have worked for a shorter period prior to the end of the contract and have received lower wages, then they will be entitled to a lower amount and shorter subsidy duration (this is as long as they haven't reached the maximum number of days worked during the prior 6 years).

government enacted a reform that introduced a new permanent contract figure whose main difference with the previous one was that the mandatory severance pay for unfair dismissals was 33 days of wages per year worked. It also introduced payroll tax reductions lasting for 2 years. In 1999, the government announced that these payroll tax reductions would last one additional year for contracts signed until May 1999. Finally, in 2001 a new labour market reform extended similar measures introduced in the 1997 reform to more groups of workers. Several authors have analysed the impact of these reforms on the creation of new employment under permanent contracts. Among them, Kugler et al. (2003) analyse the 1997 reform, Mendez (2013) studies the 1994, 1997 and 1999 reforms and Arellano (2005) investigates the effects of the 2001 labour market reform.

From 1997, also regional authorities started to implement different policies that offered subsidies to firms that hired workers using permanent contracts. As Pérez and Sanz (2009) explain, there were 2 main forms of subsidies. First, subsidies were granted to firms that converted an existing fixed term (temporary) contract into a permanent one during the period in which the subsidy was available. Second, some regions introduced subsidies that were available to those firms who hired an unemployed worker using a permanent contract. Not all regional governments decided to implement subsidies to foster permanent employment and among those regional governments that decided to give subsidies to conversion, the amount of the subsidy varied among different demographic groups. Table A.2 in Barceló and Villanueva (2010) summarises the maximum amount of the 2 forms of subsidy available to firms for every region, year, sex and age group.

3.3 Data

3.3.1 Data sources and sample construction

The main dataset used in this study is the Spanish Labour Force Survey (Encuesta de Población Activa -EPA-), a representative household survey carried out by the Spanish National Institute of Statistics (INE). This survey has been conducted since 1964 and interviews around 65000 families every quarter. Respondents are members of participating households that are 16 years old or more when the survey takes place.[6]

Graduation from compulsory education in Spain takes place during the year the student

[6]There are two versions of this survey: the longitudinal version, where households can be tracked during 6 consecutive quarters, but data on the age of individuals is aggregated in 5 year age groups, and the cross-section version, where households can not be tracked, but there is information on the birth date of individuals. Since I need the exact age of individuals both to construct the instrument and the dependent variable, I use the cross-section version of the data.

turns 16, as long as she graduates on time. Given that members of the household only respond to the individual questionnaire once they are 16 or more, I use the data from the 4th quarter for the years 2000 to 2004. This particular period is chosen for two reasons. First, from the academic year 1999-2000, all the students turning 16 in the Spanish education system are under the new law (LOGSE) that extended compulsory education from 14 to 16 years of age. Before year 2000 and given different implementation rhythms of the new law across regions and provinces, it is impossible to distinguish in the EPA data whether a student stating to have completed compulsory education has done so at age 14 (old system) or at age 16 (new system). Second, the data on regional subsidies that I am using is only collected until 2004.

In order to build my working sample I use the information on the year of birth to identify those individuals turning 16 in each cross-section and I pool them together. I match the resulting observations with the personal and labour market characteristics corresponding to their parents. There are 10284 individuals turning 16 from 2000 to 2004, but only 9142 are 16 by the time of the interview. Additionally, I can not observe the educational attainment of 1 of these individuals. Therefore, the initial available sample consists of 9141 individuals. I use the following sample selection criteria. First, since the focus of this study is to explore the impact of the father's type of contract on compulsory education completion, I only keep those students whose fathers hold either a permanent or a fixed-term contract during the year of observation. This entails the biggest reduction in the sample, since only 4907 students have a father holding a temporary or a permanent contract. The remaining students have a father that either has his own business, is unemployed, inactive or retired. Second, I only include students who live in the same household with both of their parents (4793 observations remaining). Third, individuals living in the autonomous cities of Ceuta and Melilla are excluded since there is no information available to construct the instrument (4751 observations remaining). Fourth, I exclude individuals whose parents are younger than 34 or older than 65 (4737 observations remaining).[7] Moreover, I do not consider students whose fathers voluntarily chose to have a temporary contract (4732 observations remaining).[8] Finally, I exclude those observations with missing information in any of the variables displayed in Table 2. The information on the regional unemployment rate at the time of hiring is only available since 1976, so I lose those individuals whose fathers started working at their current firm previous to 1976 (3932 observations remaining). Finally, the variables containing the sectoral information also display some missing values. The final sample is a pooled sample of 3893 (turning 16) individuals.

[7]The reasons are the following. First, those individuals that are younger than 34 became fathers before 18. Second, those individuals of 65 years of age had reached the legal retirement age in Spain during the period under analysis.

[8]These are very few observations: 0.52% of the fathers have a fixed-term contract because of voluntary reasons.

Data on regional subsidies is taken from Table A.2 in Barceló and Villanueva (2010). The statutory amounts shown in that table are the maximum amount that firms could benefit from when hiring unemployed workers or converting fixed-term contracts into permanent ones. As in Barceló and Villanueva (2010), there is no information in the Spanish Labour Force Survey that allows me to identify whether the firm that hired a specific individual claimed these benefits to the regional authorities. Therefore, these quantities represent existing subsidies that the firm could potentially use by law. The subsidy that an individual is eligible to is computed by using data on tenure at the firm, the age of the individual when first entering the firm, the gender and the region of residence. Following Barceló and Villanueva (2010) I use the average subsidy available in the region during the first two years at the firm (given that according to these authors, most contract conversions happen during the first two years at the firm).

Other sources of data have been used to construct regional variables. In particular, regional unemployment rates by age groups and sex were obtained from INE. Regional deflators of household gross disposable income have been constructed using the database BDMORES elaborated by the the Spanish Ministry of Finance.

3.3.2 Descriptive statistics: characteristics of the sample

Information on how the different variables are constructed is given in the Data Appendix. Table 1 shows descriptive statistics for the 3893 individuals that form my pooled sample, and the corresponding numbers for these individuals when divided in two groups: students whose fathers have a temporary contract the year they turn 16 and should graduate from compulsory education if on time (871 observations, or the 22.37% of the sample), and students whose fathers have a permanent contract instead (3022 observations, or the 77.63% of the sample).[9]

[9]These results do not use sample weights, but results using them are very similar. See http://blogs.worldbank.org/impactevaluations/tools-of-the-trade-when-to-use-those-sample-weights for a debate on whether to use or not sample weights, and the paper by Solon et al. (2013). Given the concerns, Section 3.5 will present unweighted results, although results using weights can be found in the Appendix. Final weights for each cross section are multiplied by a factor that is equal to the size of the sample in each cross section divided by the Spanish population in that year. Weights for the final sample are adjusted so that they add to the number of people in each cross section.

Table 1: **Descriptive statistics**

	Father: TEMP contract	Father: PERM contract	Total	Diff and t-test
Student's characteristics				
Graduation at 16	0.410	0.612	0.567	-0.202***
	(0.492)	(0.487)	(0.496)	(-10.77)
Female	0.462	0.482	0.478	-0.0209
	(0.499)	(0.500)	(0.500)	(-1.09)
Month of birth	5.657	5.885	5.834	-0.228*
	(3.139)	(3.052)	(3.073)	(-1.93)
Regional subsidies (age range students)	2.264	2.724	2.621	-0.459***
	(2.448)	(2.748)	(2.690)	(-4.74)
Father's and household's characteristics				
Age	45.12	45.83	45.67	-0.706***
	(5.392)	(4.876)	(5.004)	(-3.47)
Max education: Primary	0.541	0.294	0.349	0.247***
	(0.499)	(0.456)	(0.477)	(13.10)
Max education: Compulsory	0.362	0.305	0.318	0.0562***
	(0.481)	(0.461)	(0.466)	(3.14)
Max education: High School/Vocational	0.0666	0.201	0.171	-0.135***
	(0.249)	(0.401)	(0.377)	(-12.06)
Max education: Tertiary	0.0310	0.199	0.162	-0.168***
	(0.173)	(0.399)	(0.368)	(-18.00)
Not Spanish	0.0631	0.0288	0.0365	0.0344***
	(0.243)	(0.167)	(0.187)	(3.91)
Married	0.984	0.995	0.992	-0.0108**
	(0.126)	(0.0726)	(0.0875)	(-2.41)
Household size	4.568	4.383	4.425	0.185***
	(1.078)	(0.982)	(1.007)	(4.55)
Mother works	0.413	0.487	0.470	-0.0734***
	(0.493)	(0.500)	(0.499)	(-3.83)
Job related characteristics of fathers				
Years of tenure	1.991	14.15	11.43	-12.15***
	(3.349)	(7.721)	(8.628)	(-67.31)
Firm size (1 to 10 workers)	0.280	0.221	0.234	0.0594***
	(0.449)	(0.415)	(0.423)	(3.50)
Firm size (11 to 49 workers)	0.210	0.209	0.209	0.00130
	(0.408)	(0.407)	(0.407)	(0.08)
Firm size (more than 50 workers)	0.510	0.570	0.557	-0.0607***
	(0.500)	(0.495)	(0.497)	(-3.18)
Part-time contract	0.0138	0.00695	0.00848	0.00683
	(0.117)	(0.0831)	(0.0917)	(1.61)
Public sector	0.0873	0.257	0.219	-0.170***
	(0.282)	(0.437)	(0.414)	(-13.63)
Has another job	0.0299	0.0334	0.0326	-0.00357
	(0.170)	(0.180)	(0.178)	(-0.54)
Regional subs father	1.4857	0.4529	0.6840	1.0327
(year of hiring)	(0.0702)	(0.0278)	(0.0275)	(13.67)
Macroeconomic characteristics				
Regional unemployment rate students	33.16	32.24	32.45	0.915**
(year of obs)	(10.06)	(10.15)	(10.13)	(2.35)
Regional unemployment rate fathers	9.521	14.02	13.02	-4.503***
(year of hiring)	(4.524)	(9.517)	(8.854)	(-19.47)
N	871	3022	3893	

First line for each variable corresponds to its mean. The 4th column shows the difference in means for both groups (father: permanent contract vs father: temporary contract), and in parentheses, the value of the t-stat for a test of equality of means. Standard errors in parentheses in the second line. *, **, *** denote significance at the 10%, 5% and 1% levels. Month of birth measured from 1 to 12 (January to December, respectively). Subsidies teens are regional subsidies available for the age range of students and are expressed in thousands of year 2000 euros. Results shown do not use weights.

These descriptive statistics show that students whose fathers have a permanent contract differ from students whose fathers have a temporary contract in almost all characteristics. The first remarkable difference is in the main variable of interest: 41% of students whose fathers have a temporary contract finish compulsory education on time, whereas 61% of students whose fathers have a permanent contract do so. Fathers in these two groups differ in both personal and job related characteristics. Fathers that have fixed-term contracts have lower educational attainment, live in bigger households, are less likely to be Spanish citizens and are slightly younger. In terms of job characteristics, the most remarkable and obvious one refers to tenure. Fathers under temporary contracts have 12 years less of tenure on average. Moreover, they tend to work in smaller firms and less in the public sector. There are no differences in terms of the variables that capture whether fathers have part or full time contracts, or whether they are employed in other jobs. There are also significant differences in terms of regional unemployment rates or the amount of regional subsidies available at the time of hiring for fathers, or at the time of observation for students.

Clearly, these descriptive statistics stress the fact that using contract status alone to explain on-time compulsory education completion might not be the way to go if one wants to uncover causal effects. Students whose fathers are observed to hold permanent and fixed-term contracts, respectively, differ in many observables (and likely they differ in some unobservables too) that drive both parental contract status and on-time graduation.

3.4 Estimation strategy

The estimation strategy used in this chapter follows closely the strategy used by Barceló and Villanueva (2010) to estimate the impact of permanent contracts on the financial wealth over earnings ratio in Spain. It differs from that paper in the sense that given that both my dependent variable (on-time compulsory education completion -$G16$-) and my endogenous treatment (whether the father has a permanent contract the year his offspring should graduate from compulsory schooling -P-) are binary, I will first estimate a bivariate probit model instead of the Two Stage Least Squares (2SLS) estimates presented by Barceló and Villanueva (2010). The simultaneous equation bivariate probit model is given by:

$$G16_i = 1[\beta_1 P_i + \gamma_1' X_i + \epsilon_i > 0] \tag{3.1}$$

$$P_i = 1[\beta_2 RS_{r,a,t_0} + \gamma_2' X_i + \upsilon_i > 0] \tag{3.2}$$

(ϵ_i,υ_i) is distributed as bivariate normal with ρ=Corr(ϵ_i,υ_i). Parameters in the model are

estimated by maximum likelihood, and standard errors are robust and clustered at the level of definition of the regional subsidies.[10] Given normality of the error components, the model is identified if (ϵ_i,υ_i), conditional on covariates, is independent of the regional subsidies instrument (RS_{r,a,t_0}). As described in Section 3.3, RS_{r,a,t_0} varies with the region of residence (r), age of the worker (a) and time of hiring (t_0). In this sense, the instrument (i.e, the average amount of subsidies available in the region and age group during the first two years at the firm) exploits region, age and time variation. For this reason, X_i contains region dummies, the age of the father at the time of hiring and years of tenure at the firm (third order polynomial), as well as interactions between these variables.[11,12]

Additionally, to make the exclusion restriction more likely to hold (i.e. RS_{r,a,t_0} appears only in the second equation), I follow Barceló and Villanueva (2010) and add other control variables that might be affecting the introduction of regional subsidies. That is, identification in this chapter relies on a conditional independence assumption: the instrument is as good as randomly assigned conditional on covariates.[13] The main specification in their paper includes two dummies that capture national wide developments referring to fixed-term contract policies in the Spanish labour market. First, a dummy variable indicating whether the father entered the labour market after the 1984 reform that liberalised the use of temporary contracts is included. Second, the model also includes a dummy for whether the labour contract was signed on or after 1997, to capture the effect of several policies introducing a new type of permanent contract with lower indemnities and taking place after 1997. As Barceló and Villanueva (2010) point out, by including this post-1997 dummy, β_2 captures mainly regional variation in the availability of subsidies to foster permanent contracts. Dummy variables capturing the maximum education level reached by the father and his nationality are also included. Finally, to avoid any remaining regional trends, I also include the regional unemployment rate in the age band of the father at the time of hiring. These variables all coincide with the variables included in Barceló and Villanueva (2010), but I include two additional variables in my basic specification (see column 1 in Table 2), and there are some other variables used by Barceló and Villanueva (2010) that I include later on.[14] The two additional variables that I control for are the following. First, I

[10] That is, clusters are defined by the region of residence, father's age at the time of hiring and year of hiring.

[11] The instrument is a sort of triple difference, but not exactly. First, because following Barceló and Villanueva (2010) I use the amount of the subsidy and not a variable based on simple eligibility (results using a dummy eligibility variable are very similar). Second, because each region defined differently the eligible age group and time where the subsidies where in place.

[12] As Barceló and Villanueva (2010) argue, the third order polynomial in tenure is a key covariate that allows to compare workers who entered the firm in the same year. These authors also tried with tenure fixed effects given that they had a bigger sample, and found very similar results. Thus, I follow the same strategy and include in the model a third order polynomial in tenure instead of year of hiring (tenure) fixed effects.

[13] As Angrist and Pischke (2008) suggest, I check whether there is an association between the instrument and the outcome in samples where there should be no relationship between P_i and RS_{r,a,t_0} in Section 3.5.1.

[14] Logarithm of earnings is the only variable that Barceló and Villanueva (2010) use that I can not include in

Table 2: **Control variables in the different specifications**

	(1)	(2)	(3)	(4)
Basic specification				
Regional dummies (at the NUTS-2 level)	✓	✓	✓	✓
Age father (at hiring)	✓	✓	✓	✓
Father's third order polynomial in tenure	✓	✓	✓	✓
Father started contract after 1997	✓	✓	✓	✓
Father entered labour market after 1984	✓	✓	✓	✓
Regional unemployment rate, age range father (father's year of hiring)	✓	✓	✓	✓
Regional unemployment rate, age range student (year of observation)	✓	✓	✓	✓
Regional subsidies, age range student (year of observation)	✓	✓	✓	✓
Father's maximum education reached dummies	✓	✓	✓	✓
Father's Nationality (Not Spanish=1)	✓	✓	✓	✓
Year dummies (year of observation)	✓	✓	✓	✓
Additional job characteristics				
Sectoral dummies		✓	✓	✓
Occupation dummies		✓	✓	✓
Other household variables				
Household size dummies			✓	✓
Whether mothers works			✓	✓
Civil status father			✓	✓
Additional student characteristics				
Sex				✓
Quarter of birth dummies				✓

See the data appendix for the exact definition of variables. Additionally, all specifications include interactions between region dummies and tenure, region dummies and age father (at hiring), and tenure by age father (at hiring).

include the amount of regional subsidies available to hire workers in the age range of the students during the year of observation. The existence of regional subsidies for young people is likely to be correlated with the existence of subsidies for fathers, and these subsidies for the young might at the same time affect school related decisions or outcomes. Second, I control for the regional unemployment rate in the age range of the students. Columns 2 to 4 in Table 2 describe additional variables added as controls to this basic specification. Moreover, all specifications control also for year (of observation) dummies.

As long as the model is correctly specified, the bivariate probit model can be used to estimate average causal effects (Angrist and Pischke, 2008). For each model, I present the results of a Wald test for the absence of correlation (i.e. under the null hypothesis, ρ=0). If the null can not be rejected, then ϵ and υ are not correlated and the model collapses to two separate probit models.[15]

For comparison, I also present Instrumental Variable (IV) estimates, though these estimates should be taken with care. As Chiburis et al. (2012) point out, linear IV estimates might be particularly uninformative for hypothesis testing when treatment probabilities are low. Moreover, bivariate probit and IV estimates identify different types of causal effects. Whereas bivariate

my model given lack of data on earnings in the Spanish Labour Force Survey.

[15]The results of two separate probit models are identical to estimating a bivariate probit model imposing ρ=0.

probit identifies average causal effects, the best you can do without a distributional assumption is LATE, the average causal effect for compliers (or local average treatment effect). This effect is, if all assumptions are fulfilled (independence, exclusion restriction, existence of a first stage and monotonicity) what the IV/2SLS approximates when covariates are used (Angrist and Pischke, 2008).

A major concern regarding the estimation strategy used in this chapter is related to the timing in which the outcome and the paternal contract status are observed. First, graduating late can potentially be the result of several years of low educational achievements. Unfortunately, the EPA data does not allow to identify whether the student is graduating late because she has repeated a grade earlier in her life, or because she fails to pass a grade during the years in secondary school, prior to graduation. PISA data for Spain for the year 2003, though, could offer some insights in this direction.[16] According to this data, grade repetition in Spain happens mainly during compulsory secondary education: 25.02% of 15-year old pupils who have repeated a grade at least once have done so during compulsory secondary education, whereas 6.34% of them have repeated a grade at least once during primary education. Accordingly, I would expect that for students in my sample, grade repetition happens mostly during compulsory secondary education, a period in which regional subsidies (i.e. the instrument) were already in place. Second, fathers could hold permanent or temporary jobs for reasons stemming from several years back in the past. Instrumental variable estimates would take care of this issue, since, as already mentioned before, the effect that IV identifies is the causal effect for compliers.[17] In the case of this study, these would be the children of fathers who hold a permanent contract in the year of graduation precisely because they were affected by the regional subsidies instrument. Therefore, IV estimates would identify the effect only for those students for whom the timing is the right one.[18]

3.5 Results

Results that focus on the role of the type of contract held by the father on the probability of on-time graduation from compulsory education of his offspring are presented in this section. The role of the type of contract held by the mother is analysed afterwards. Lastly, the last

[16] I take the data for 2003 because the PISA data on the first year available, year 2000, does not contain information on repetition of grades. Moreover, 2003 is the only year in the PISA dataset that is within the observation period of the sample used in this chapter.

[17] This holds under the assumption of no defiers. That is, there is no individual that would hold a permanent contract when he is not eligible to regional subsidies, and that would hold a temporary contract when he is eligible to regional subsidies.

[18] IV estimates can not identify the impact for those children whose fathers would have held a permanent contract even in the absence of regional subsidies (always takers); or for those children whose fathers would have held a temporary contract in any case (never takers).

Table 3: **Bivariate probit: Summary of results**

	(1)	(2)	(3)	(4)
Equation 1: On-time graduation				
Father has PERM contract	0.0319	0.0883	0.1017	0.1032
	(0.1255)	(0.0945)	(0.0968)	(0.0939)
Equation 2: Perm contract				
Regional subsidies father	0.0089**	0.0107***	0.0111***	0.0109***
	(0.0039)	(0.0037)	(0.0036)	(0.0037)
Wald test of ρ=0; (p-value)	0.7269	0.8134	0.7123	0.6908
Log pseudolikelihood	-3379.100	-3253.129	-3236.913	-3224.003
N	3893	3893	3893	3893
F test of excluded instruments	10.83	14.29	14.58	15.01

Bivariate probit coefficients displayed are average marginal effects for the probabilities $P(G16 = 1)$ and $P(P = 1)$, respectively. Clustered robust SE in parentheses (clustered at the regional subsidy cell level). Unweighted estimates. Regional subsidies are the average amount of subsidies available to the firm in the father's first two years of tenure at the firm (expressed in thousands of year 2000 euros). Variables included in the different specifications are reported in Table 2. F test of excluded instruments is the one coming from the linear IV setting, but reproduced here for convenience.

subsection will address potential heterogeneous impacts of the treatment variable.

3.5.1 Father's contract type

Table 3 presents the summary results of the bivariate probit model estimations. Note that the coefficients displayed in the chapter for all bivariate probit or probit estimations are average marginal effects (see footnotes for each table). The results presented in the main body of the text are the result of unweighted estimations. Results using weights can be found in Tables A3 and A4.

The results of the bivariate probit first stage (equation 2, Table 3) show that an increase of 1000 euros in the regional subsidies available to firms increases the chances of observing the father holding a permanent contract by almost 1 percentage point. The F test of excluded instruments coming from the IV setting (reproduced here for explanatory convenience), is above 14 in the last 3 specifications. This indicates that the instrument, at least in the linear setting, is reasonably strong.[19] Additionally, Table A1 follows the suggestion by Angrist and Pischke (2008) and tests whether there is an association between the regional subsidies instruments and the probability of graduating on time in samples where there should be no relationship between P_i and RS_{r,a,t_0}. As Barceló and Villanueva (2010) argue, most conversions from temporary to permanent contracts happen during the first two years at the firm, so we should observe very few happening after 4 or 5 years at the firm. Thus, the variation in current labour status generated by an inappropriate instrument (the amount of regional subsidies the worker would be eligible

[19](Baum et al., 2007) note that when using clustered standard errors, researchers should apply with caution the critical values compiled by Stock and Yogo (2005) for the i.i.d case or refer to the older rule of thumb of Staiger and Stock (1997), which says that the F statistic should be at least 10 for weak identification not to be considered a problem.

Table 4: **Probit: Summary of results**

	(1)	(2)	(3)	(4)
Equation: On-time graduation				
Father has a PERM contract	0.0736***	0.0676**	0.0686**	0.0687**
	(0.0266)	(0.0279)	(0.0278)	(0.0278)
Log pseudolikelihood	-2454.580	-2441.452	-2427.601	-2418.769
N	3893	3893	3893	3893

Probit coefficients displayed are average marginal effects. Clustered robust SE in parentheses (clustered at the regional subsidy cell level). Unweighted estimates. Variables included in the different specifications are reported in Table 2.

for after 4 or 5 years at the firm) should have little impact on the probability of his offspring finishing compulsory education on time. This is what is found in Table A1. The magnitude of the coefficients is very close to zero in all specifications, and estimates are not significant in any case.

The bivariate probit estimates for the effect of having a father holding a permanent contract the year the student should graduate from compulsory education on the probability of his offspring graduating on time are positive, but not significantly different from zero. However, the Wald test of ρ equal to 0 can not reject the null in any of the specifications.[20] These results would imply that, conditional on this set of covariates, there is no correlation between the error terms of both equations (no remaining omitted variable bias) and they should be estimated separately.

This is what Table 4 shows, but only the results of the equation and variable of interest (equation 1) are presented. Full results of specification (4) can be found in Table A3, both for weighted and unweighted regressions. The average marginal effects displayed in Table 4 imply that students whose fathers hold a permanent contract in the year of graduation (instead of a fixed-term one) are 7 percentage points more likely to graduate from compulsory education on time. According to these results, after accounting for the controls specified in Table 2, having a father with a more stable job would explain around 35% of the initial difference seen in Table 1.[21]

For comparison, Table 5 presents summary results of OLS, Intention to Treat and IV estimates. Full results of specification (4) in that table can be found in Table A4. Results of OLS estimates are shown in the first panel and are very similar to the probit average marginal effects shown in Table 4. The second panel of Table 5 focuses on intention to treat effects. First, if regional subsidies influence on-time graduation from compulsory education through the contract status of working parents, one would expect to find an association between regional subsidies

[20]The results of the Wald test hold even if the instrument is not used in equation 2. See Table A2.

[21]The initial difference was of 20% percentage points, with students whose fathers have a permanent contract the year of graduation having a 41% chance of graduating, versus a 61% chance observed for students whose fathers are seen to hold a permanent contract instead.

Table 5: **OLS, ITT and IV: Summary of results**

	(1)	(2)	(3)	(4)
OLS. Equation: On-time graduation				
Father has a PERM contract	0.0793***	0.0727**	0.0736**	0.0732**
	(0.0280)	(0.0294)	(0.0293)	(0.0294)
Intention to Treat Effects				
Reduced form. Equation: On-time graduation				
Regional subsidies father	0.0120*	0.0124*	0.0126*	0.0117*
	(0.0070)	(0.0071)	(0.0070)	(0.0070)
First stage. Equation: Perm contract				
Regional subsidies father	0.0188***	0.0207***	0.0208***	0.0212***
	(0.0057)	(0.0055)	(0.0055)	(0.0055)
F test of excluded instruments	10.83	14.29	14.58	15.01
IV. Equation: On-time graduation				
Father has a PERM contract	0.6422*	0.6000*	0.6047*	0.5540*
	(0.3881)	(0.3432)	(0.3376)	(0.3282)
N	3893	3893	3893	3893

Clustered robust SE in parentheses (clustered at the regional subsidy cell level). Unweighted estimates. Regional subsidies are the average amount of subsidies available to the firm in the father's first two years of tenure at the firm (expressed in thousands of year 2000 euros). Variables included in the different specifications are reported in Table 2.

and on-time graduation. This is what is shown in the reduced form regressions of the middle panel of the table. An increase of 1000 euros in the regional subsidies available to fathers during the first two years at the firm increases the chances of on-time graduation of their offspring by 1 percentage point in any of the specifications. The linear first stage shown also in the middle panel of the table is in line with the results described above for the bivariate probit first stage, although the magnitude of the impact of regional subsidies on the contract status of the father is considerably higher, and more similar to the linear first stage results in Barceló and Villanueva (2010). Compared to the results of these authors, the instrument is strong even after including regional dummies (their instrument is weak after inclusion of regional dummy variables). This might be due to several reasons. First, I use a different dataset and a different period. Second, my first stage doesn't cover the full sample of working men, but rather, the sample of working parents of 16 year olds.[22]

IV estimates of the effect of having a father holding a permanent contract the year the offspring should graduate from compulsory education are considerably larger than probit average marginal effects, with IV estimates showing an estimated impact of around 55 percentage points (bottom panel of Table 5).[23] The same happens in Pinger (2013), that analyses the impact of

[22]In a paper that evaluates the effectiveness of these regional subsidies to create permanent employment, Pérez and Sanz (2009) find that the outflow into permanent employment of eligible workers improved only minimally with these subsidies.

[23]However, if one considers the size of the standard errors in the IV estimations, probit and IV estimates would

parental unemployment on the probability of upper secondary school choice and obtains a negative impact of above 50 percentage points. As already discussed in Section 4, the IV estimator captures the effect of compliers; i.e. in the case of the present study, if all assumptions hold, the IV estimator offers a weighted local average treatment effect for those students whose fathers hold a permanent contract due to the availability of regional subsidies at the time of hiring whereas probit estimates capture average marginal effects instead.

Compliers are, therefore, individuals that got a permanent contract due to the existence of regional subsidies but otherwise would have been observed holding a temporary contract in the year their offspring should graduate from compulsory education. Being these individuals males, they were probably the main breadwinners in the household even before obtaining the permanent contract. As a result, one could think that, for compliers, those inputs in the grade production function affected by parental contract status (household income, parental job stability, etc.) were at a low level prior to the obtention of a permanent contract, and improved considerably after that.[24] Assuming concavity of the grade production function, the increase in the inputs associated to obtaining a permanent contract for compliers entails a bigger increase in grades in this subpopulation. Likewise, if parental job stability affects the cost of effort and children of temporary workers display in general a high level, the reduction in the cost of effort due to the fathers' obtention of a permanent contract would be bigger for compliers, given convexity of the cost function.

not be so different since confidence intervals largely overlap.

[24] Consider the toy model outlined in Chapter 2 and summarised here for convenience. In that model a student in general education was faced with the decision to choose how much effort, e, to devote to study. Assume that student's utility while she is in school depends directly and positively on the grades she obtains, G. The grade production function is determined by the level of effort supplied by the student: $G = g(e)$ and is supposed to be strictly increasing and concave in the level of effort. The effort that students devote to study entails a disutility, $d(e)$, which is supposed to be strictly increasing and convex. The student chooses the level of effort to maximise her utility:

$$\max_{e} \; U(G, e) = g(e) - d(e) \tag{3.3}$$

The first order condition for an interior solution is equal to: $g'(e) = d'(e)$. In order to introduce heterogeneity in this framework, I follow Card (1999) by assuming that the marginal rate of return to effort, $g'(e) = \beta_i(e) = b_i - k_1 e$, and the marginal cost of effort, $d'(e) = \delta_i = r_i + k_2 e$, are linear functions with person-specific intercepts and homogeneous slopes (with $k_1 \geq 0$ and $k_2 \geq 0$). Variation in b_i could be seen as capturing variation in the inputs affecting the production function for cognitive achievement (see Todd and Wolpin (2003)). Variation in r_i instead can be seen as different tastes for effort. The type of contract held by the father could be affecting, therefore, both marginal returns and marginal costs of effort since paternal contract status is shown to affect variables typically seen as inputs in the grade production function and it could also be affecting marginal costs of effort (Barling et al., 1999a). The optimal level of effort under heterogeneity is then given by:

$$e_i^* = \frac{b_i - r_i}{k_1 + k_2} \tag{3.4}$$

Where a necessary condition for the equilibrium to exist with non-negative levels of effort is that $b_i \geq r_i$. Under the assumption that the student has not repeated any grade until the last year of compulsory schooling, she completes education on time if her effort is above a certain level, $\bar{e}$ (that, in turn, leads grades to be above the passing threshold, $\bar{g}$): $G16 = 1[e_i^* \geq \bar{e} \equiv G_i \geq \bar{g}]$.

Table 6: **Probit: Summary of results - Including mother's contract status**

	(1)	(2)
Equation: On-time graduation		
Father has a PERM contract	0.0688**	0.0680**
	(0.0278)	(0.0278)
Mother has a PERM contract	-0.0028	0.0148
	(0.0232)	(0.0175)
Log pseudolikelihood	-2418.7620	-2419.3950
Controls	All	Excluding Mother works
N	3893	3893

Probit coefficients displayed are average marginal effects. Clustered robust SE in parentheses (clustered at the regional subsidy cell level). Unweighted estimates. Variables included in the different specifications are reported in column (4) of Table 2.

Other potential reasons to explain the bigger magnitude of IV estimates are as follows. First, a fraction of the increase in magnitude could also be explained by the fact that treatment is very much concentrated and linear IV estimates might be uninformative in these cases. Also, part of the increase could be related to the bias of IV in small samples (Chiburis et al., 2012). Moreover, the bigger magnitude of IV estimates could be partly explained by attenuation bias due to measurement error in paternal contract status.

3.5.2 Mother's contract type

I use the same sample selection criteria outlined in Section 3.1 but this time taking into account the characteristics of the mother, in order to obtain the final sample of turning 16 years old whose mothers are observed as either holding a permanent or a temporary contract. Given the lower attachment of women to the labour market, the number of observations falls to 2350. In the sample, 71% of the mothers hold a permanent contract. Table A5 shows the results of using the same estimation strategy followed in the case of fathers, to analyse the impact of maternal contractual form on the probability of their offspring's on-time graduation from compulsory education. The results of the first stage imply that the regional subsidies variable is a very weak instrument in this setting. Given this, I can not analyse in a rigorous manner the causal impact of the mother's contractual form on her children's probability of on-time graduation. Nonetheless, it is noteworthy to point out that, after conditioning on the same set of variables as for the father, both probit and OLS estimates of the maternal contract type are not significantly different from zero. Moreover, Table 6 augments the probit model estimated for the father in Table 4 (specification (4)) with a dummy variable indicating whether the mother holds a permanent contract. Results related to the father's contractual form do not change after including the mother's type of contract, with or without additionally controlling for her working status.

Table 7: **Probit: Summary of results - Heterogeneous effects**

Equation: On-time graduation	(1)	(2)
Panel A: Father's education	Low educ	High educ
Father has a PERM	0.0653**	0.1180**
	(0.0323)	(0.0576)
Log pseudolikelihood	-1693.0028	-673.3844
Sample	Post-comp=0	Post-comp=1
Fathers with PERM contract in the subgroup (%)	69.75	93.44
N	2598	1293
Panel B: Sex of the student	Girls	Boys
Father has a PERM contract	0.0390	0.0910**
	(0.0400)	(0.0377)
Log pseudolikelihood	-1118.6672	-1252.3831
Fathers with PERM contract in the subgroup (%)	78.39	76.93
N	1860	2033
Panel C: Working status mother	Mother doesn't work	Mother works
Father has a PERM contract	0.0422	0.1074***
	(0.0372)	(0.0405)
Log pseudolikelihood	-1281.1293	-1092.5190
Fathers with PERM contract in the subgroup (%)	75.22	80.34
N	2062	1831

Probit coefficients displayed are average marginal effects. Clustered robust SE in parentheses (clustered at the regional subsidy cell level). Unweighted estimates. Variables included in the different specifications are reported in column (4) of Table 2. Post-comp is a dummy variable equal to 1 if father's attained education level is High-School or beyond, and equal to 0 if father's attained education is equal to compulsory education or lower.

3.5.3 Heterogeneous effects

This final section briefly explores whether the measured average marginal effects of the type of contract held by the father differ across different groups of students in the sample. Table 7 summarises the results.

Panel A divides the sample of students in two groups, those whose fathers have a level of education beyond post-compulsory education and those whose fathers have a maximum attained level of education that is lower than that. The average marginal effect is lower for those students whose fathers have a lower attained level of education. However, confidence intervals for the average marginal effects in both groups largely overlap. In Panel, the sample is split according to the sex of the student. The estimated average marginal effects for females suggest that females are not affected by whether the father has a more stable job. The positive effect of more job stability is concentrated and more beneficial to males. Literature on social psychology has found that identification with the parents works as a moderator when assessing the impact of parental job insecurity on children's work attitudes and beliefs (Barling et al., 1998). According to this

literature, if males identify themselves more with fathers than females do, male students would be more distracted cognitively by paternal job insecurity. Finally, Panel C investigates whether there is an heterogeneous impact between students whose mothers work and students whose mothers do not work. The results suggest that the benefits of more paternal job stability are concentrated on those students living in a household where the mother also works.

3.6 Discussion

The findings of this chapter show that parental job stability is beneficial for students. I use regional variation in subsidies (available to firms to create permanent employment) in order to identify the effect of the type of contract held by the father on on-time compulsory education completion. Using the Spanish Labour Force Survey data, I present estimates for both average marginal effects coming from bivariate probit and probit models and local average treatment effects (LATE). Results indicate that students whose fathers hold a permanent contract (as opposed to a temporary, fixed-term contract) the year they should graduate from compulsory education are, on average, 7 percentage points more likely to graduate on time. LATE estimates are considerably higher, suggesting that those students whose fathers obtained a permanent contract as a result of the availability of subsidies, reaped bigger benefits from paternal job stability (although as mentioned in the text, IV estimates need to be taken with care). These results hold when maternal job insecurity is also accounted for, and they are concentrated on male students. These latter results are in line with the findings of several papers on the social psychology field. For instance, (Barling et al., 1998) found that identification with the parents works as a moderator when assessing the impact of parental job insecurity on children's work attitudes and beliefs. According to this literature, if males identify themselves more with fathers than females do, male students would then be more distracted cognitively by paternal job insecurity. Students that at age 16 have not graduated from compulsory education are either delayed in getting their diploma (i.e. they have repeated at least a grade) or have gone out of the school system (i.e. dropouts). If we view grade repetition and school dropout as a signal of academic difficulties, then the effects found in this chapter might be pointing out future or longer-term negative outcomes in both education and earnings. However, more research is needed in order to fully understand the magnitude of the effects of parental job stability on their offspring's educational outcomes. In particular, this could be done by trying to get access to panel data that allows to observe the contract status of an individual over time, and at the same time, observe a more disaggregated educational outcome (like grades) over the same period. This type of data does not exist, at the time of writing, for the Spanish case, but a first step in this direction could be taken by exploring datasets in other countries with a strong dual labour market.

What are the potential mechanisms by which paternal job insecurity translates into worse ed-

ucational outcomes for children? Labour earning differences between permanent and temporary workers might be part of the explanation. Table A6 shows descriptive statistics for fathers and mothers of children in the same age range than those analysed in this chapter, but using data from the Spanish section of the European Household Panel.[25] Both for mothers and fathers, individuals under a temporary contract earn less than half of the average of permanent workers. This average, though, does not account for characteristics of the workers that might explain this difference. Once controlling for the level of education, sector, occupation, years of tenure, and the rest of variables used as controls in this study, the difference in income between temporary and permanent workers might be considerably reduced. Rather than income, something that the controls in the regressions presented here might not capture and could be considered as a potential mechanism driving the differential effect found for fathers and mothers, is the level of satisfaction with different aspects of the job. Table A6 shows that fathers holding a temporary contract are significantly less satisfied with their earnings, job stability, type of job, hours and shift worked, their labour conditions and distance to the workplace. Moreover, according to studies in the field of social psychology, children from as young as 5 years of age, understand such concepts as pay, labour disputes, unemployment and welfare. Children's perceptions of their parent's job insecurity are then found to indirectly affect their school performance (Barling et al., 1999a). Similarly, Barling et al. (1998) postulate a model by which children who watch their parents experiencing layoffs and insecurity, develop negative work beliefs that then predict their work-related attitudes. Mothers are less satisfied with their jobs too when they hold a temporary contract but according to some studies, the effects of job insecurity on money anxiety are only present for men but not for women (Lim and Sng, 2006). Therefore, a lower degree of satisfaction related to earnings, stability, etc., would be more felt at home if it's the father (rather than the mother) suffering from it.

The results in this chapter could have some implications for other papers that study the link between parental unemployment and educational outcomes. If these studies would focus on the differences between children of unemployed fathers and children whose fathers have a permanent contract, they would find even larger differences than the ones reported until now. In particular, if the estimates come from an economy with a strong dual labour market. Additionally, the findings in this chapter add to the debate on the need to take seriously the (unintended) consequences of the development of an extreme dual labour market, like has been the case in Spain over the last decades.

[25]The number of variables is richer in the European Household Panel, but the number of observations available for this study would be considerably lower, as it can be seen by the number of observations displayed in Table A6. This is the main reason why labour force survey data was chosen instead.

3.7 Data appendix

Below you can find information on the definition of the variables used in the analysis. The variables are defined for the father, but the exact same definitions follow when the analysis is performed with data of the mother.

Dependent variable: *Graduation at 16 (G16)* is a dummy variable that equals 1 if the student has graduated from compulsory education in the 4th quarter of the year she turns 16 (turning 16 individuals). This corresponds to code 23 in the survey data. I have also classified as having graduated from compulsory education those individuals that reported a maximum level of education reached higher than compulsory education even if this is unlikely given their age.
Main explanatory variable: *Father has a PERM contract (PERM)* is a dummy that equals 1 if the father is observed as having a permanent contract, and 0 if he has a fixed-term contract.
The instrument - Regional subsidies: *Regional subsidies father* is the average subsidy amount available in the region during the first two years of employment at the current firm. *Regional subsidies (age range student)* is the amount available to hire workers in the age range of the students in their region of residence and year of observation. Both variables are expressed in thousands of euros (year 2000). See Table A.2 in Barceló and Villanueva (2010) for the specific amounts.
National reforms: *Father started contract after 1997* is a dummy variable equal to 1 if the current contract held by the father was signed on or after 1997. *Father entered labour market after 1984* is a dummy variable that equals 1 if the father entered the labour market on or after 1984. Since the Spanish Labour Force survey does not offer information on the year an individual first enters the labour market, I construct a proxy in this way: Year individual enters labour market=Year of observation-Age+Age finished studies.
Father's job related characteristics: *Third order polynomial in tenure*: Father's tenure is expressed in years and introduced as tenure, tenure squared and tenure cubed. *Sectoral dummies* are dummies corresponding to the sector of activity of the firm in which the father works. In order to reduce the number of dummies, I have grouped the 2 digit sectors into the following: Agriculture and extractive industries, Manufacture and Energy, Construction, Services I (retail and hotels), Services II (Transport and Communication, Finance and Renting Activities), Public Administration, Education and Health, Other services. The information for the *Occupation dummies* is given in CNO-94 (National Classification of Occupations 1994) format at the 2 digit level for the current job. I create occupation dummies at the 1 digit level.
Father's personal characteristics: *Maximum education reached dummies* are four dummies for whether the father has primary education or less; has completed compulsory education; has completed high-school or vocational education (for which compulsory education is needed); or has completed tertiary education. *Nationality (Not Spanish=1)* is a dummy that equals 1 if the

father is not a Spanish citizen; *Age father (at hiring)* is the age of the father the year he was hired at the current firm. *Married* is a dummy equal to 1 if the father is married.

Regional characteristics: *Regional unemployment rate, age range father* is the unemployment rate in the region of residence, in the age range of the father, the year of hiring by the current firm. *Regional unemployment rate, age range student* is the unemployment rate in the region of residence, for the age range of the student, and in the year of observation. Both unemployment rates are at the NUTS-2 level and in percent.

Student's characteristics: *Female* is a dummy variable equal to 1 if the student is a female, and *Quarter of birth dummies -Q1, Q2, Q3, Q4-* are dummies equal to 1 if the student is born in that quarter and 0 otherwise.

Other: *Household dummies* are dummies for whether the student lives in a 3, 4, 5 or 6 or more people household. *Mother works* is a dummy variable that equals 1 if the mother works (i.e. has her own business or works for a firm). *Year dummies* are dummies for years 2000 to 2004 and *Regional dummies* are dummies at the NUTS-2 level.

3.8 Appendix

Table A1: **Robustness check: reduced form placebo - impact future subsidies on** $P(G16 = 1)$

Equation: On-time graduation	(1)	(2)	(3)	(4)
Regional subsidies father -	0.0007	0.0008	0.0009	0.0015
4 years after hiring	(0.0069)	(0.0069)	(0.0069)	(0.0069)
N	3155	3155	3155	3155
Regional subsidies father -	0.0002	0.0003	0.0018	0.0021
5 years after hiring	(0.0079)	(0.0079)	(0.0079)	(0.0078)
N	2890	2890	2890	2890

OLS coefficients. Clustered robust SE in parentheses (clustered at the regional subsidy cell level). Unweighted estimates. Regional subsidies are the amount of subsidies available to the firm after 4 and 5 years with respect to the time of hiring, respectively (expressed in thousands of year 2000 euros). Variables included in the different specifications are reported in Table 2.

Table A2: **Bivariate probit: Summary of results - No instrument used in equation 2**

	(1)	(2)	(3)	(4)
Equation 1: On-time graduation				
Father has PERM contract	-0.0082	0.0608	0.0745	0.0794
	(0.1303)	(0.0998)	(0.1031)	(0.0992)
Wald test of ρ=0; (p-value)	0.5132	0.9410	0.9509	0.9064
Log pseudolikelihood	-3382.509	-3258.785	-3242.887	-3229.795
N	3893	3893	3893	3893

Bivariate probit coefficients displayed only for equation 1 are average marginal effects for the probability $P(G16 = 1)$. Clustered robust SE in parentheses (clustered at the regional subsidy cell level). Unweighted estimates. Regional subsidies are the average amount of subsidies available to the firm in the father's first two years of tenure at the firm (expressed in thousands of year 2000 euros). Variables included in the different specifications are reported in Table 2.

Table A3: **Probit: Full table of results**

Equation: On-time graduation	Unweighted	Weighted
Main variable of interest		
Father has a PERM contract	0.0687**	0.0883***
	(0.0278)	(0.0311)
Father's related variables		
Age (at hiring)	0.0027	0.0036
	(0.0037)	(0.0040)
Tenure (in years)	-0.0082	-0.0103
	(0.0156)	(0.0183)
Tenure squared	0.0001	0.0007
	(0.0009)	(0.0010)
Tenure cubed	0.0000	-0.0000
	(0.0000)	(0.0000)
Contract started after 1997	-0.0713**	-0.0403
	(0.0339)	(0.0396)
Entered labour market after 1984	-0.0159	0.0116
	(0.0376)	(0.0421)
Regional unemp rate	0.0007	0.0001
(year of hiring)	(0.0013)	(0.0015)
Max education: Compulsory	0.0695***	0.0770***
	(0.0198)	(0.0225)
Max education: High School	0.1372***	0.1238***
	(0.0261)	(0.0304)
Max education: Tertiary	0.2170***	0.2205***
	(0.0434)	(0.0520)
Not Spanish	-0.1043**	-0.1058**
	(0.0424)	(0.0492)
Married	0.1242	0.1136
	(0.0892)	(0.0923)
Household variables		
Mother works	0.0222	0.0235
	(0.0159)	(0.0183)
Household size (4 people)	-0.0020	0.0011
	(0.0256)	(0.0292)
Household size (5 people)	-0.0553*	-0.0592*
	(0.0285)	(0.0326)
Household size (6 or more)	-0.1063***	-0.0896**
	(0.0328)	(0.0365)
Student's related characteristics		
Female	0.0915***	0.0914***
	(0.0266)	(0.0316)
Quarter birth 1	0.0381	0.0403
	(0.0241)	(0.0281)
Quarter birth 2	0.0132	0.0056
	(0.0243)	(0.0278)
Quarter birth 3	0.0489**	0.0325
	(0.0242)	(0.0280)
Regional subsidies	-0.0057	0.0019
(age range students)	(0.0055)	(0.0064)
Regional unemp rate students 0.0002	0.0002	
(year of observation)	(0.0016)	(0.0019)
Log pseudolikelihood	-2418.7692	-2411.3640
N	3893	3893

Probit coefficients displayed are average marginal effects for the probability $P(G16 = 1)$. Clustered robust SE in parentheses (clustered at the regional subsidy cell level). Variables included are reported in Table 2, column (4).

Table A4: **OLS, First stage and IV: Full table of results**

	Unweighted results			Weighted results		
	OLS	First Stage	IV	OLS	First Stage	IV
Dependent variable:	**G16=1**	**PERM=1**	**G16=1**	**G16=1**	**PERM=1**	**G16=1**
Main variables of interest						
Father has a PERM contract	0.0732**		0.5540*	0.0928***		0.8245**
	(0.0294)		(0.3282)	(0.0331)		(0.4044)
Regional subsidies father		0.0212***			0.0208***	
		(0.0055)			(0.0056)	
Father's related variables						
Age (at hiring)	0.0028	-0.0013	0.0030	0.0036	-0.0017	0.0042
	(0.0038)	(0.0023)	(0.0039)	(0.0042)	(0.0024)	(0.0044)
Tenure (in years)	-0.0075	0.1569***	-0.0842	-0.0096	0.1597***	-0.1274*
	(0.0159)	(0.0091)	(0.0545)	(0.0186)	(0.0102)	(0.0683)
Tenure squared	0.0001	-0.0104***	0.0051	0.0007	-0.0107***	0.0085*
	(0.0009)	(0.0005)	(0.0036)	(0.0010)	(0.0006)	(0.0045)
Tenure cubed	0.0000	0.0002***	-0.0001	-0.0000	0.0002***	-0.0002*
	(0.0000)	(0.0000)	(0.0001)	(0.0000)	(0.0000)	(0.0001)
Contract started after 1997	-0.0761**	-0.0724**	-0.0562	-0.0442	-0.0434	-0.0392
	(0.0356)	(0.0285)	(0.0389)	(0.0420)	(0.0302)	(0.0441)
Entered labour market after 1984	-0.0116	-0.0419*	0.0079	0.0174	-0.0670**	0.0642
	(0.0368)	(0.0234)	(0.0415)	(0.0410)	(0.0308)	(0.0537)
Regional unemp rate	0.0007	0.0016***	-0.0001	0.0001	0.0021***	-0.0016
(year of hiring)	(0.0013)	(0.0005)	(0.0014)	(0.0015)	(0.0005)	(0.0018)
Max education: Compulsory	0.0740***	-0.0126	0.0806***	0.0816***	-0.0078	0.0881***
	(0.0212)	(0.0128)	(0.0222)	(0.0242)	(0.0145)	(0.0259)
Max education: High School	0.1436***	0.0305**	0.1288***	0.1307***	0.0383**	0.1027***
	(0.0272)	(0.0152)	(0.0296)	(0.0319)	(0.0179)	(0.0389)
Max education: Tertiary	0.2147***	0.0344	0.1986***	0.2155***	0.0562**	0.1766***
	(0.0418)	(0.0223)	(0.0436)	(0.0496)	(0.0239)	(0.0581)
Not Spanish	-0.1052**	0.0026	-0.1070**	-0.1077**	-0.0182	-0.0980*
	(0.0427)	(0.0300)	(0.0457)	(0.0494)	(0.0377)	(0.0584)
Married	0.1343	0.0658	0.1029	0.1210	0.0724	0.0670
	(0.0932)	(0.0656)	(0.1044)	(0.0962)	(0.0766)	(0.1152)
Household variables						
Mother works	0.0219	0.0062	0.0196	0.0238	0.0123	0.0160
	(0.0162)	(0.0092)	(0.0166)	(0.0188)	(0.0104)	(0.0207)
Household size (4 people)	-0.0036	0.0035	-0.0047	-0.0005	-0.0106	0.0086
	(0.0263)	(0.0147)	(0.0269)	(0.0300)	(0.0173)	(0.0313)
Household size (5 people)	-0.0584**	-0.0012	-0.0574*	-0.0617*	-0.0153	-0.0488
	(0.0295)	(0.0166)	(0.0302)	(0.0337)	(0.0198)	(0.0362)
Household size (6 or more)	-0.1100***	0.0228	-0.1201***	-0.0937**	0.0120	-0.0995**
	(0.0340)	(0.0196)	(0.0356)	(0.0375)	(0.0225)	(0.0396)
Student's related characteristics						
Female	0.0903***	-0.0211	0.0990***	0.0894***	-0.0251	0.1042***
	(0.0267)	(0.0148)	(0.0281)	(0.0319)	(0.0164)	(0.0343)
Quarter birth 1	0.0376	0.0039	0.0357	0.0394	-0.0031	0.0427
	(0.0247)	(0.0136)	(0.0252)	(0.0287)	(0.0156)	(0.0306)
Quarter birth 2	0.0131	0.0009	0.0138	0.0048	-0.0027	0.0103
	(0.0250)	(0.0134)	(0.0254)	(0.0286)	(0.0155)	(0.0309)
Quarter birth 3	0.0482*	0.0269**	0.0360	0.0310	0.0331**	0.0101
	(0.0248)	(0.0132)	(0.0267)	(0.0287)	(0.0148)	(0.0336)
Regional subsidies	-0.0055	0.0026	-0.0078	0.0022	0.0029	-0.0021
(age range students)	(0.0056)	(0.0033)	(0.0058)	(0.0065)	(0.0035)	(0.0068)
Regional unemp rate students	0.0002	0.0018*	-0.0005	0.0002	0.0016	-0.0005
(year of observation)	(0.0016)	(0.0009)	(0.0017)	(0.0019)	(0.0010)	(0.0021)
F test of excluded instruments		15.01			13.54	
N	3893	3893	3893	3893	3893	3893

Clustered robust SE in parentheses (clustered at the regional subsidy cell level). Regional subsidies are the average amount of subsidies available to the firm in the father's first two years of tenure at the firm (expressed in thousands of year 2000 euros). Additional variables included are reported in Table 2, column (4).

Table A5: **Summary of results - Mother**

	(1)	(2)	(3)	(4)
Probit. Equation: On-time graduation				
Mother has a PERM contract	-0.0014	-0.0059	-0.0069	-0.0048
	(0.0277)	(0.0281)	(0.0281)	(0.0281)
OLS. Equation: On-time graduation				
Mother has a PERM contract	-0.0012	-0.0065	-0.0075	-0.0057
	(0.0297)	(0.0302)	(0.0302)	(0.0302)
Intention to Treat Effects				
Reduced form. Equation: On-time graduation				
Regional subsidies mother	-0.0062	-0.0053	-0.0050	-0.0045
	(0.0089)	(0.0090)	(0.0089)	(0.0089)
First stage. Equation: Perm contract				
Regional subsidies mother	0.0125*	0.0117*	0.0117*	0.0117*
	(0.0069)	(0.0069)	(0.0069)	(0.0069)
F test of excluded instruments	3.24	2.89	2.91	2.88
N	2350	2350	2350	2350

Probit coefficients displayed are average marginal effects. Clustered robust SE in parentheses (clustered at the regional subsidy cell level). Regional subsidies are the average amount of subsidies available to the firm in the mother's first two years of tenure at the firm (expressed in thousands of year 2000 euros). Variables included in the different specifications are the same ones as the reported in Table 2 for fathers. Unweighted estimates.

Table A6: **Other characteristics of Perms vs Temps: European Household Panel**

	Fathers			Mothers		
	Temps	Perms	Diff	Temps	Perms	Diff
Degree of satisfaction with several aspects of the job (1: not satisfied to 6: completely satisfied-)						
Earnings satisfaction	2.824	3.428	-0.604***	2.864	3.399	-0.535***
	(1.249)	(1.320)	(-4.83)	(1.366)	(1.271)	(-3.43)
Job stability	2.954	4.866	-1.912***	2.852	4.942	-2.090***
	(1.380)	(1.214)	(-14.80)	(1.630)	(1.217)	(-11.18)
Type of job	4.160	4.536	-0.375***	3.897	4.553	-0.657***
	(1.408)	(1.200)	(-2.86)	(1.585)	(1.301)	(-3.54)
Hours worked	3.893	4.127	-0.234*	3.886	4.347	-0.461***
	(1.366)	(1.348)	(-1.82)	(1.401)	(1.221)	(-3.02)
Shift worked	4.092	4.402	-0.311**	4.207	4.570	-0.363**
	(1.344)	(1.313)	(-2.47)	(1.390)	(1.284)	(-2.28)
Labour conditions	3.746	4.399	-0.652***	4.443	4.394	0.0496
	(1.427)	(1.282)	(-5.22)	(1.267)	(1.344)	(0.31)
Distance to workplace	3.588	4.406	-0.818***	4.102	4.341	-0.239
	(1.529)	(1.440)	(-5.90)	(1.501)	(1.528)	(-1.30)
Average job satisfaction	3.602	4.312	-0.710***	3.736	4.368	-0.632***
	(0.885)	(0.847)	(-8.69)	(0.928)	(0.841)	(-6.02)
Health related characteristics						
Subjective health status	2.030	2.052	-0.0220	2.068	2.080	-0.0119
	(0.778)	(0.660)	(-0.31)	(0.785)	(0.719)	(-0.13)
Suffers chronic disease	0.150	0.0955	0.0549*	0.114	0.131	-0.0178
	(0.359)	(0.294)	(1.66)	(0.319)	(0.338)	(-0.44)
Stay hospital last 12 months	0.0677	0.0434	0.0243	0.0455	0.0673	-0.0219
	(0.252)	(0.204)	(1.05)	(0.209)	(0.251)	(-0.83)
Number visits doctor	2.361	2.382	-0.0212	2.773	2.913	-0.141
	(1.361)	(1.232)	(-0.18)	(1.345)	(1.266)	(-0.91)
Other variables						
Annual labour earnings	1227870.9	2770000.2	-1542129.3***	826226.3	1988890.5	-1162664.2***
	(772725.7)	(1909696.2)	(-15.78)	(787777.3)	(1018455.5)	(-11.41)
Never moved from current region	0.626	0.602	0.0239	0.670	0.644	0.0262
	(0.486)	(0.490)	(0.53)	(0.473)	(0.480)	(0.45)
Been unemployed in last 5 years	0.698	0.117	0.581***	0.591	0.173	0.418***
	(0.461)	(0.322)	(14.18)	(0.494)	(0.379)	(7.34)
Vandalism in neighborhood	0.223	0.167	0.0556	(0.418)	(0.374)	(1.46)
N	139	694		88	312	

Own calculations using data from the Spanish section of the European Household Panel. Data belongs to fathers and mothers that have a permanent or a temporary contract, and are parents of individuals turning 17 in the panel (1995-2001) that live with at least one of the parents. The 3rd and 6th column shows the difference in means for both groups (permanent contract vs temporary contract), and in parentheses, the value of the t-stat for a test of equality of means. Standard errors in parentheses in the second line. *, **, *** denote significance at the 10%, 5% and 1% levels. Weights not used but results using weights are very similar. Annual labour earnings in pesetas. Subjective health status is measured in a 1 (very good) to 5 (very bad) scale.

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