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Permanent employment and fertility: The importance of job security and the career costs of childbearing

Adrián Nieto Castro

Produced By:

Centre for Finance, Credit and Macroeconomics
School of Economics
Sir Clive Granger Building
University of Nottingham
University Park
Nottingham
NG7 2RD

hilary.hughes@nottingham.ac.uk

Permanent Employment and Fertility: The Importance of Job Security and the Career Costs of Childbearing*

Adrián Nieto

Abstract

This article studies the impact of permanent employment on the fertility decision. I identify a causal effect by exploiting exogenous variation in subsidies to permanent contracts. Using a 2SLS specification, I firstly examine whether the subsidies had an impact on the use of open-ended contracts, and, in a second step, whether permanent employment has an effect on the decision of having a child. Holding an open-ended contract has a positive impact on the fertility decision by means of a higher job security. However, this effect vanishes when the career costs of childbearing are high. The paper provides two sets of evidence of the previous findings. My micro results based on individual administrative data are consistent with the estimates obtained using aggregate data.

Keywords: Fertility Decision, Permanent Employment, Job Security, Career Costs of Childbearing, Instrumental Variables

JEL classification: J08, J13, J41.

*Corresponding address: Adrián Nieto Castro, University of Nottingham, Sir Clive Granger Building, University Park, Nottingham, NG7 2RD, United Kingdom. E-mail: adrian.nietocastro@nottingham.ac.uk. I am grateful to Professor Gianni De Fraja and Dr Sarah Bridges for their useful comments, feedback, and support. I am also thankful to José Ignacio García-Pérez and Yolanda Rebollo-Sanz for providing me with their data on regional subsidies, and resolving my questions. I also thank Cristina Barceló, Miguel Ángel Malo, José Antonio Ortega, Konstantinos Tatsiramos and Ernesto Villanueva for their help and valuable suggestions. I also thank Camila Cisneros, Apoorva Gupta, and Lionel Roger for their useful comments. Finally, I thank participants at seminars at the University of Nottingham and University of Salamanca. Any error is mine.

1 Introduction

The average number of children born per woman in Spain has decreased from 2.22 in 1980 to 1.33 in 2016 (World Bank, 2017). This stands as one of the lowest fertility rates registered in Europe, and falls way below the 2.1 live births per woman that is considered to be the replacement level of a country. At the same time, the proportion of employees holding a temporary contract in the Spanish labour market has increased from 15.6% in 1987 to 26.1% in 2016 (OECD, 2017). Spain is the European country with the highest rate of temporary employment (García-Pérez and Rebollo-Sanz, 2009).

This paper studies whether permanent employment has an impact on the fertility decision. This may occur through two different channels. On the one hand, permanent employment reduces economic uncertainty by decreasing the probability of transiting into unemployment in future periods. Previous literature has found that job security has a positive effect on the decision of having a child (Ahn and Mira, 2003; De la Rica and Iza, 2005; Gutierrez-Doménech, 2008; Ervin et al, 2013). On the other hand, permanent employment has been associated with higher opportunities of career development and with an accelerated wage progression (Arulampalam et al, 1998; Booth et al, 2002; Pavlopoulos, 2009). This may increase the opportunity cost of having a child, and therefore, lead to a decrease in fertility (Heckman and Walker, 1990; Gayle and Miller, 2006; Donoghue et al, 2011). In principle, it is unclear what impact may permanent employment have on the fertility decision.

Estimating the effect of permanent employment on the fertility behaviour introduces identification problems, as the labour market status may be correlated with unobserved characteristics that determine the decision of having a child. I tackle potential endogeneity problems by exploiting exogenous variation in subsidies to open-ended contracts. These subsidies were given by the different Spanish regional governments to the employers who hired an unemployed individual as a permanent employee, or that transformed a temporary contract into an open-ended one. The amounts of these incentives not only varied across regions, but also depending on the age, gender, and year-of-entry of the worker at the firm. I use this four-dimension exogenous variation as an instrument for permanent employment. Using a 2SLS specification, I firstly examine whether differences in the amounts of the subsidies had an impact on the use of permanent contracts in the Spanish labour market, and, in a second step, whether permanent employment has an effect on the decision of having a child. The identifying assumption is that subsidies to use open-ended contracts are not correlated with unobserved characteristics that determine the fertility decision. I conduct the analysis using individual data that comes from the Social Security Records and contains administrative information on the labour and fertility complete history of 1.1 million of individuals.

Importantly, previous literature has suggested that increases in earnings and employment prospects have a positive impact on the fertility decision of males, but a negative effect on the fertility decision of females (Heckman and Walker, 1990; Schaller, 2016). To address the concern of heterogeneity in the

effects depending on gender, I perform the analysis separately for males and females. I find that permanent employment has a positive impact on the fertility decision of males, but a negligible effect for females. Despite increasing job security, permanent employment may have no effect on the fertility behaviour of females due to the higher career costs of childbearing they hold.

Previous evidence has found that the fertility behaviour responds to changes in the career prospects during the life cycle. For example, couples have been found to time conceptions to circumvent periods when female earnings are expected to be high (Ward and Butz, 1980). I split my sample by age to further study whether the career costs of childbearing matter in the impact that permanent employment has on the fertility decision. In principle, the career costs of childbearing are higher at the stage of the life cycle when individuals are investing more in their career development. I find that permanent employment increases the probability of mature males having a child in the following period, but has a negligible impact for the subsample of young men. Holding an open-ended contract has no impact on the fertility decision of females, independently of their age. I also split my sample by level of education to give additional evidence on how the career costs of childbearing alter the effect that permanent employment has on the fertility decision. Intuitively, the career costs of childbearing are higher for greater levels of education. I find that holding an open-ended contract increases the probability of low-qualified males having a child in the following year, but has a negligible impact for high-qualified men. Permanent employment has no effect on the fertility decision of females, independently of their level of qualification.

This paper also quantifies the magnitude of the impact of the policy on the labour market and fertility rates in Spain. This is done in a separate aggregate analysis that constitutes a second set of evidence of the impact that permanent employment has on the fertility decision. The aggregate analysis is conducted using a dataset that comes from the Spanish Public State Employment Service (SEPE) and the National Statistical Institute (INE). This data contains information of every labour contract and birth episode that occurred in Spain during the period 1997-2004, aggregated at the municipality level. The empirical strategy that I follow in the aggregate analysis adopts the subsidies to open-ended contracts as an instrument for permanent employment in a different 2SLS specification than the one previously mentioned. I find that the policy increased the presence of permanent employment at the cost of reducing the use of temporary jobs, and that the increase in the creation of open-ended contracts boosted fertility rates in the following periods. Using my aggregate estimates, I document that the policy created 29,640 open-ended contracts and increased the number of births by 8,150.

This paper contributes in several ways to previous literature on the impact that permanent employment has on the fertility decision. First, and to the best of my knowledge, this is the first paper that shows causal evidence on the heterogeneous impact that permanent employment has on the fertility behaviour, depending on the gender, age, and level of qualification of individuals. The evidence given suggests that permanent employment has a positive

effect on the fertility decision by means of a higher job security, but that this effect vanishes when the career costs of childbearing are high. Second, this paper gives two sets of evidence of the effect that permanent employment has on the fertility decision. I do so by performing two separate analyses that respectively use individual and aggregate data. My micro results are consistent with the estimates from the aggregate analysis. The use of administrative data in both analyses avoids sample selection and self-reported biases. Third, this paper evaluates whether my instrument, which consists in the regional subsidies that were given to incentivize the use of open-ended contracts, was effective in generating permanent employment in the labour market. This is important to assess whether the public expenditure allocated into these subsidies (0.28% of Spanish GDP) was efficient from a public policy point of view.

This paper also contributes to existing research on the effect of economic uncertainty on the fertility decision. Previous literature has found that unemployment, job loss, and displacement from a career-oriented job reduce fertility (Andersson, 2000; Adsera, 2005; Andersen et al, 2011; Bhaumik et al, 2011; Ananat et al, 2013; Modena et al, 2014; Del Bono et al, 2015). Moreover, strong educational and socioeconomic attributes have been reported to be present in the previous impact (Kreyenfeld et al, 2014), with male unemployment rates decreasing childbearing further than female unemployment (Cazzola et al, 2016). Overall, economic uncertainty has frequently been reported to have a negative impact on the fertility decision, but estimating the previous has usually been done under difficulties. Duration and multivariate models that do not exploit any exogenous variation in the exposure to employment risk have frequently been used, and therefore, endogenous estimates may have been inferred. A solution that has been generally given to address this problem is to lag the dependent variable to avoid reverse causality. This, however, does not avoid the endogeneity that may be present through a series of events and preferences interlinked along the life course (Angrist and Evans, 1998). This paper addresses the previous concern by exploiting exogenous variation in subsidies to open-ended contracts.

The remainder of the paper is organized as follows. Section II describes the subsidies to promote the use of open-ended contracts. Section III presents the data that I use in the individual analysis, and section IV shows its descriptive statistics. Section V and VI respectively contain the empirical strategy and the results of the individual analysis. Section VII shows the data, methodology, and results of the aggregate analysis. Section VIII concludes.

2 Regional subsidies and labour market context

Fixed-term contracts are analogous to open-ended ones except that the former have a limited duration and lower firing costs in the case of unfair dismissal. In 1997, in an attempt to reduce the use of temporary employment, the Spanish government introduced a labour market reform that decreased signifi-

cantly both unfair dismissal costs and payroll taxes of open-ended contracts. In the same year, some of the 17 Spanish regional governments started introducing subsidies that were given to a company when it converted a temporary contract into an open-ended one.[1] These incentives had generally the form of lump-sum type, made in a single payment, but in some cases, they took the form of a reduction in the payroll tax that the companies had to pay. Figure 1 shows the average subsidy given by region and year during the period 1996-2004. Two aspects must be noted. First, not all the regional governments introduced incentives to use open-ended contracts at the same time. Whereas by 1997 only three of the 17 regional governments provided subsidies to use open-ended contracts, the number had increased to 14 by 2000. However, this provision faded away in some regions after 2000, and some other regional governments (Navarra and Catalonia) never gave a subsidy. Second, there was a high variation in the amounts of the subsidies that were given across regions and over time. In particular, subsidies implied a reduction in the labour costs of the first year of open-ended contracts that ranged from 9% to more than 60% depending on the year and region where the company was established. The average subsidy represented a 24% reduction in the labour costs of the first year of new open-ended contracts (García-Pérez and Rebollo-Sanz, 2009). Quantities of the incentives also varied by age and gender of the individuals who were hired on a permanent basis. In particular, lower subsidies were frequently given when the individual was male or middle-aged. Overall, I exploit exogenous variation at four different levels in these subsidies to study the causal effect of permanent employment on the fertility behaviour.

3 Data

I use the 2006 wave of the dataset Muestra Continua de Vidas Laborales (MCVL), which comes from the Spanish Social Security Records. The MCVL is a large administrative dataset containing information on the complete labour history of approximately 1.1 million of individuals randomly selected from the Spanish Social Security records. This represents 4% of the total number of workers, unemployed, and retired individuals in Spain in 2006. The MCVL includes labour market information on the individual such as his earnings, occupation, type of contract (e.g: whether it is open-ended or fixed-term, or whether it is full-time or part-time), and date of start and end of the labour spell. The dataset also contains sociodemographic information on the age, gender, educational level, nationality and province of residence of the individual. Finally, the MCVL gives information on the employer, such as industry, whether it is private or public, and the province where the job is established. Administrative

[1] Regional governments also provided subsidies when a company hired an unemployed person as a permanent employee. I do not consider this form of the subsidy because most of the incentives provided were given to the firms that converted a fixed-term contract into a permanent one (Villanueva and Barceló, 2016).

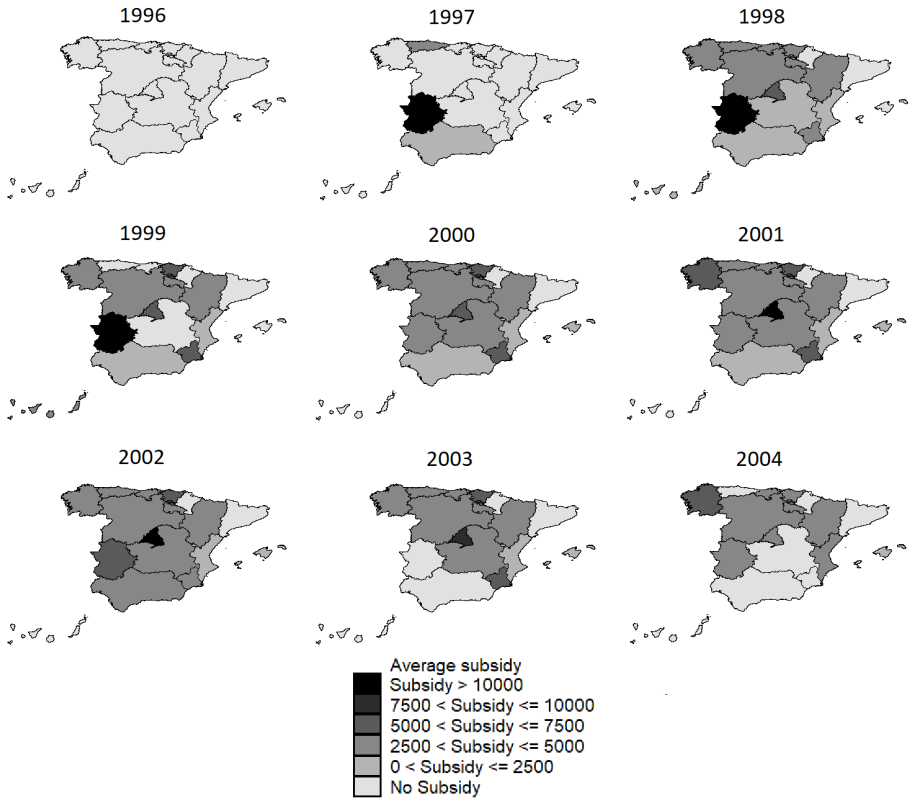

Figure 1: Average Regional Subsidies in euros by CCAA and year

data has the strength of minimizing the problem of missing information and measurement error coming from recall biases and self-reporting.

I restrict my sample to employees, excluding other labour market spells such as self-employment, unemployment, or inactivity. Due to data availability, I restrict my sample to the period from 1997 to 2004. The MCVL has been matched to the 2006 Spanish Registry of Inhabitants (SMRI), which contains information about the date of birth and gender of the members of the household to which the individuals included in the MCVL pertain. I use this information to construct the yearly fertility history of individuals. However, the MCVL does not provide information about the family relationship between the members living in the household. Following Bonet et al. (2013), I restrict my analysis to individuals aged 16-50 living in households with five or fewer members. The reason to do this is that the probability of adults cohabiting with children that are not their offspring augments with the number of members in the household and with the age of the head of the household. Overall, this sample selection results in an unbalanced panel of more than 3 million of observations on approximately half million of individuals.

It is important to note that even though this dataset is a representative sample of the labour market in 2006, it is not in the previous years (Domínguez, 2012). For example, individuals strongly attached to the labour market are more likely to be present in the data in the years before 2006. Given that the dataset does not contain information of the whole population in Spain, the previous may constitute a source of bias (Domínguez, 2012). This, however, is minimized by the fact that my sample period does not include years far back in time, and so, more than 80% of my sample is present in every year of the period under analysis, with only 2.8% of the observations being present in 3 or fewer years. Also, given that I make use of individual fixed effects in the analysis, singleton observations are dropped.

4 Descriptive analysis

It is important to study whether permanent and temporary employees are different in observed characteristics that may explain discrepancies in their fertility behaviour. As previously discussed, I split my sample into males and females to address the concern of permanent employment having a different effect on the fertility decision depending on gender. Columns 1-2 of table 1 respectively present the summary statistics of temporary and permanent male employees. Column 3 reports the p-values of tests comparing the means of temporary and permanent male employees under the null hypothesis of the two being equal. Columns 4-6 are similar than the previous three columns, but for the sample of females. On average, and with independence of gender, individuals holding an open-ended contract earn almost double, have been more years working for the same company, are more likely to work for the private sector, and have a higher probability of holding a full-time position, than temporary employees. Moreover, permanent employees are older, more qualified, and more likely to be natives. It is also important to account for differences in my outcome variable between the two types of employees. Permanent employees are more likely to have a child, and to have had a child in the previous 5 years.

Overall, the effect that permanent employment may have on the fertility decision is unclear. On the one hand, permanent employees have a lower probability of transiting into unemployment than temporary workers. As a response, holding an open-ended contract translates into a lower economic uncertainty that may encourage the decision of childbearing. On the other hand, permanent employees have a higher wage and are more qualified. This increases the career costs of childbearing and may therefore decrease the probability of having a child in the following periods.

It is also important to mention differences between males and females. Men have a higher probability of holding a full-time contract, earn more, are more likely to work for the private sector, and are less qualified than women. Males are also more likely than females to have a child when holding a temporary contract, but this difference vanishes when both hold an open-ended contract. Finally, males are less likely than females to have had a child in the

previous five years when holding a temporary contract, but the opposite occurs when both hold a permanent contract. The latter may be a result of males being older than females when holding an open-ended contract.

Table 1: Descriptive statistics

	Males			Females		
	Temp Emp	Perm Emp	p-val	Temp Emp	Perm Emp	p-val
Full-time	0.91	0.96	0.000	0.73	0.84	0.000
	(0.29)	(0.19)		(0.44)	(0.37)	
Month Wage	699.09	1390.21	0.000	540.25	1098.31	0.000
	(511.02)	(652.44)		(499.88)	(614.29)	
Tenure	2.31	6.22	0.000	2.32	5.67	0.000
	(1.70)	(5.26)		(1.86)	(5.10)	
Private sector	0.70	0.89	0.000	0.63	0.81	0.000
	(0.46)	(0.32)		(0.48)	(0.39)	
High-qualified	0.27	0.41	0.000	0.43	0.51	0.000
	(0.44)	(0.49)		(0.50)	(0.50)	
Age	29.96	35.68	0.000	30.00	34.21	0.000
	(8.64)	(8.11)		(8.36)	(8.03)	
Native	0.96	0.98	0.000	0.97	0.98	0.000
	(0.20)	(0.13)		(0.16)	(0.13)	
Prob child	0.03	0.04	0.000	0.02	0.04	0.000
	(0.16)	(0.18)		(0.15)	(0.19)	
Prob child	0.10	0.15	0.000	0.11	0.13	0.000
past 5 years	(0.31)	(0.36)		(0.31)	(0.34)	
N	830,351	1,008,072		608,864	637,389	

The sample contains employees aged 16-50. The table displays the means of my observable covariates, and the standard deviations in parentheses.

5 Empirical Strategy

This paper studies the effect of permanent employment on the fertility decision. I perform the analysis separately for males and females to address the concern of permanent employment having a different effect on the fertility decision depending on gender. Therefore, I estimate the following regression model separately for the sample of males and females:

$$F_{i,t+1} = \alpha + \beta PE_{i,t} + \phi X_{i,t} + \lambda_t + \delta_i + \varepsilon_{i,t} \tag{1}$$

where $F_{i,t+1}$ is a binary variable that equals 1 if individual i has a new child at time $t+1$, and zero otherwise. I forward my dependent variable by

one year to allow for the nine months pregnancy period. In the analysis, I also estimate the previous specification forwarding the dependent variable by two years, to estimate the impact of permanent employment on the fertility decision in the short run. $PE_{i,t}$ is a dummy that equals 1 if individual i holds an open-ended contract at time t, and 0 otherwise. $X_{i,t}$ is a vector of covariates that are time-varying at the individual level. In particular, $X_{i,t}$ includes age and age squared to control for non-linearities of fertility in age,[2] the logarithm of wage, tenure, tenure squared, a dummy that indicates whether the individual works for the public sector, and a binary variable that takes value 1 if the individual holds a full-time contract and 0 if the job is part-time. $X_{i,t}$ also contains a set of two-digit industry dummies, and a set of binary variables that indicate the region where individual i lives at time t. Finally, some regional governments gave grants to the women that gave birth in some of the years within the period 1997-2004. I account for this by including a dummy that takes value 1 if the individual i lives in a region where incentives to fertility are present at year t, and 0 otherwise. θ_t are year fixed effects to control for flexible trends in the dependent variable common across individuals, and μ_i is a set of individual fixed effects dummies to capture unobserved individual time-invariant characteristics. Finally, $\varepsilon_{i,t}$ is an individual and time specific level error term. In my empirical analysis, I cluster standard errors at the individual level to allow for an arbitrary correlation of residuals within individuals.

The coefficient of interest, β, represents the impact of holding a permanent contract at t on the probability of having a child at $t+1$. Estimating this using OLS may lead to biased estimates as labour market status may be endogenous to the fertility decision. For example, permanent contract eligibility may be correlated with parental status or employees may self-select themselves into an open-ended contract due to unobserved characteristics that also affect childbearing. To address this concern, I use exogenous variation in the subsidies to use open-ended contracts at four different levels (across regions, years, age and gender) as an instrument for permanent employment.

Following Angrist and Pischke (2009), I use a standard linear model estimated by 2SLS to study the causal impact of an endogenous dummy regressor on a binary outcome variable. In particular, my 2SLS specification firstly estimates whether subsidies increased the probability of individuals holding an open-ended contract, and then, it uses the previous to identify the causal impact of permanent employment on the probability of having a child in the following period. This gives rise to the following first-stage:

$$PE_{i,t} = \omega + \pi S_{j,g,a,t} + \eta X_{i,t} + \theta_t + \mu_i + \nu_{i,t} \tag{2}$$

where $S_{j,g,a,t}$ is the subsidy for which a company located in region j at

[2]To keep simplicity in the interpretation of my estimates, I rescale my variable age by substracting the minimum age of the sample (16) to it. Therefore, variable age takes value 0 when the age of the individual is 16, and value 34 when it is 50

time t is eligible if it converts a temporary employee of gender g and age a into a permanent worker. There are four dimensions of variation of $S_{j,g,a,t}$: (i) different amounts of the subsidies were given across the different regions, (ii) the amount of the subsidy changed over time within each region, (iii) higher subsidies were generally given for female employees, and (iv) lower subsidies were usually provided for middle-aged workers. I construct $S_{j,g,a,t}$ following the information contained in Villanueva and Barceló (2016), and measure it in terms of the percentage of labour costs saved during the first year of new open-ended contracts.[3] I include the same set of controls than in specification (1). Finally, $\nu_{i,t}$ is an individual and time specific level error term. Overall, the first stage estimates show, by using Ordinary Least Squares (OLS), whether the subsidies increased the presence of permanent employment. The coefficient of interest, π, assesses whether a reduction in the labour costs of open-ended contracts has an impact on the probability of an individual holding a permanent contract.

In summary, using the previous 2SLS specification allows me to estimate the causal impact of permanent employment on the fertility decision. The identification assumption is that, conditional on the covariates included in the model, subsidies are only correlated with the fertility decision through permanent employment.

5.1 Validity of the instrument

The validity of my identification strategy relies on $S_{j,g,a,t}$ being correlated with $PE_{i,t}$, and orthogonal to the error term $\varepsilon_{i,t}$. First, there are reasons to believe that $S_{j,g,a,t}$ may be correlated with $PE_{i,t}$, as subsidies were only provided if a company converted a temporary contract into a permanent one. Second, it is important to bear in mind that subsidies were given to the companies, and not to the workers. Subsequently, despite eligibility of a company for the incentives was based on the age and gender of the employee whose contract was to be transformed, subsidies were unlikely to be correlated with other characteristics of workers that may have affected their fertility decision. However, one possible concern is that the composition of eligible and non-eligible workers may have changed over time, as a response to the introduction of incentives to use open-ended contracts. For example, individuals might have moved to regions with generous subsidies, or temporary workers may have negotiated with their employer the timing of their contract conversion before the subsidies became effective. Were this the case, subsidies would be correlated with unobserved characteristics that may also affect the fertility decision, and my 2SLS estimates would be biased. The fact that subsidies were suddenly approved in a yearly basis, and the strong temporal variability in the eligibility conditions,

[3] I therefore divide the amount of the subsidy for which a company located in region j at time t is eligible when it hires an individual of age a and gender g under an open-ended contract, by the average total labour costs of region j at time t. I accordingly measure $S_{j,g,a,t}$ in terms of the percentage of labour cost saved during the first year of contract, instead measuring it in thousands of euros.

avoided workers anticipatedly changing their behaviour. Moreover, the MCVL allows me to control for a rich set of observable covariates that may affect the fertility decision. Taking into account the previous, the identifying assumption is that, conditional on individual fixed effects, year fixed effects, and observable time-varying individual characteristics, the instrument $S_{j,g,a,t}$ is not correlated with $\varepsilon_{i,t}$.

6 Empirical Results

6.1 The Effect of Subsidies on the Labour Market

Table 2 presents the first-stage OLS estimates and their respective t-statistics for the sample of males. Column 1 reports the impact of the subsidies to promote the use of permanent employment on the probability of a male individual i holding an open-ended contract at time t. As shown, eligibility for a decrease of 10% in the labour costs of the first year of new open-ended contracts increases the probability of a male holding a permanent contract by 0.387%. The estimate is significant at the 1% confidence level. Given that the average subsidy reduced the labour costs of the first year of new open-ended contracts by 24% (García-Pérez and Rebollo-Sanz, 2009), the policy increased the probability of a male holding an open-ended contract by 0.93%. The magnitude of the estimate is similar than the ones obtained in previous literature (García-Pérez and Rebollo-Sanz, 2009; Villanueva and Barceló, 2016).[4]

Columns 2-3 respectively present the first-stage estimates for the subsample of young (less than 30 years old) and mature (30 years or older) male individuals. Eligibility for a decrease of 10% in the labour costs of the first year of new open-ended contracts increases the probability of young and mature males holding a permanent contract, but the magnitude of the estimate is more than twice bigger for the subsample of young men. Estimates are significant at the 1% confidence level. Columns 4-5 respectively estimate the first-stage for the subsample of low-qualified (have pursued secondary compulsory education or lower) and high-qualified (education higher than secondary compulsory education) males. As shown, the policy increased the probability of males holding an open-ended contract with independence of their level of qualification. However, the magnitude of the estimate of the subsidies is three times bigger for the subsample of low qualified males. Estimates are significant at the 1% confidence level.

Table 3 is identical to table 2, but for the sample of females. Column 1 reports that eligibility for a decrease of 10% in the labour costs of the first year of new open-ended contracts increases the likelihood of a woman holding

[4]For example, an increase in the average subsidy by 1,000 euros has been shown to raise the probability of workers holding an open-ended contract by 1.1% (Villanueva and Barceló, 2016). Similarly, an increase in the average subsidy by 4,800 euros has been shown to boost the conversion of temporary contracts of middle-aged female workers into permanent ones by 0.44% every quarter (Garcia-Perez and Rebollo-Sanz, 2009).

a permanent contract by 0.337%, which is slightly lower in magnitude than the estimate found for males. Columns 2-5 show that the subsidies had a positive effect on the probability of females holding a permanent contract independently of their age and level of qualification, but that the impact of the policy was higher for young and low-qualified women. Estimates of the subsidies are significant at the 1% confidence level, and have a similar magnitude than the ones found for males. Overall, I conclude that the policy increased the presence of permanent contracts, and that young and low-qualified individuals benefited more from the subsidies.

Panel B of tables 2 and 3 reports the Kleibergen-Paap rk LM statistics and the Kleibergen-Paap rk Wald F statistics of all the specifications. I use these two statistics to respectively test whether the instrument is correlated with the endogenous regressor, and whether the correlation is weak. The Kleibergen-Paap rk LM statistics show that I can always reject the null of underidentification. The Kleibergen-Paap rk Wald F statistics are always higher than the threshold of 10 proposed by Stock et al. (2002), and therefore, the null of my instrument being weak is always rejected. I conclude that my instrument is a strong predictor of my endogenous variable.

6.2 Permanent Employment and the Fertility Decision

Table 4 displays the estimates of the second stage for the sample of males, to study the causal impact of permanent employment on their fertility decision. Columns 1-2 respectively present the OLS and 2SLS estimates of equation (1). As shown, holding an open-ended contract increases the probability of males having a child in the following period in both specifications, and the estimates are significant at the 1% and 5% confidence level, respectively. Importantly, the 2SLS estimate (8.17%) is significantly higher in magnitude than the OLS one (0.27%). This suggests the presence of an important downwards bias in the OLS estimate. A possible explanation is that males who hold a permanent contract may be more likely to have already settled their family. As shown in the summary statistics, males holding an open-ended contract are more likely to have had one or more children in the previous periods. This, together with the low number of children that an average person has in Spain (1,33), suggest that males holding an open-ended contract are more likely to have already settled their family.

Columns 3-4 respectively present the second-stage estimates for the subsample of young and mature males. I split the sample by age to explore whether the career costs of childbearing play a role on the impact that permanent employment has on the fertility decision. In principle, the career costs of childbearing are higher at the stage of the life cycle when individuals are investing more in their career development. Therefore, if the professional costs of having a child matter, the impact of permanent employment on the fertility decision will be lower for young individuals. As shown, holding an open-ended contract increases the probability of mature males having a child in the following period

Table 2: Results First Stage for Males

Panel A:	Dependent variable: Probability of holding an open-ended contract				
		Age		Level of qualification	
		Young	Mature	Low	High
	(1)	(2)	(3)	(4)	(5)
Subsidy	0.000387***	0.000522***	0.000207***	0.000452***	0.000153***
	(18.05)	(12.70)	(8.47)	(16.34)	(4.45)
Age	0.0435***	0.0364***	0.0172***	0.0364***	0.0620***
	(95.44)	(34.06)	(18.88)	(67.31)	(73.12)
Age^2	-0.000827***	-0.000247***	-0.000252***	-0.000704***	-0.00119***
	(-81.04)	(-3.83)	(-13.83)	(-57.38)	(-64.51)
Logwage	0.0674***	0.0536***	0.0647***	0.0589***	0.0805***
	(125.23)	(74.43)	(69.69)	(92.36)	(82.86)
Full-time	0.0246***	0.000146	0.0600***	0.00614**	0.0433***
	(10.81)	(0.06)	(13.50)	(2.09)	(12.01)
Fert Grant	0.0253***	0.0366***	0.0154***	0.0275***	0.0173***
	(17.44)	(13.12)	(9.39)	(14.85)	(7.41)
Tenure	0.0499***	0.119***	0.0391***	0.0549***	0.0403***
	(148.99)	(49.12)	(111.39)	(126.70)	(77.09)
$Tenure^2$	-0.00201***	-0.00920***	-0.00152***	-0.00212***	-0.00172***
	(-132.04)	(-26.28)	(-105.54)	(-108.11)	(-72.83)
Public Sector	-0.125***	-0.128***	-0.113***	-0.117***	-0.147***
	(-115.03)	(-79.25)	(-75.66)	(-93.88)	(-66.35)
Constant	-0.662***	-0.599***	-0.358***	-0.539***	-0.900***
	(-75.50)	(-52.78)	(-21.48)	(-53.21)	(-48.14)
Panel B:			Tests		
Underid F-stat	323.713	160.077	71.448	265.222	19.761
Weak id F-stat	325.707	161.217	71.740	267.137	19.790
Observations	1,848,746	717,764	1,130,982	1,199,075	641,558

* p<0.10, ** p<0.05, *** p<0.001

t statistics in parentheses. The sample contains male employees aged 16-50. All the specifications include individual and year fixed effects (not shown in the table). I also include (not shown) as additional controls in every specification a set of regional and two-digit industry dummies. Underid F-stat refers to Kleibergen-Paap rk LM statistic, and I use it to test whether my instrument is correlated with the endogenous regressor. Weak id F-stat refers to the Kleibergen-Paap rk Wald F statistic, and I use it to test whether my instrument is weak. I cluster standard errors at the individual level.

Table 3: Results First Stage for Females

Panel A:	Dependent variable: Probability of holding an open-ended contract				
		Age		Level of qualification	
		Young	Mature	Low	High
	(1)	(2)	(3)	(4)	(5)
Subsidy	0.000337***	0.000469***	0.000194***	0.000401***	0.000251***
	(11.16)	(8.76)	(5.50)	(9.53)	(5.75)
Age	0.0488***	0.0468***	0.0127***	0.0432***	0.0599***
	(85.04)	(35.25)	(10.00)	(57.39)	(66.85)
Age^2	-0.000800***	-0.000299***	-0.00000556	-0.000599***	-0.00116***
	(-58.42)	(-3.93)	(-0.21)	(-34.13)	(-53.59)
Logwage	0.0781***	0.0587***	0.0819***	0.0764***	0.0779***
	(133.27)	(75.60)	(81.64)	(97.36)	(88.44)
Full-time	0.00453**	-0.00761***	0.0145***	-0.0135***	0.0271***
	(2.65)	(-3.56)	(5.08)	(-5.87)	(10.52)
Fert Grant	0.0258***	0.0385***	0.0153***	0.0293***	0.0207***
	(13.93)	(11.99)	(6.78)	(11.12)	(7.97)
Tenure	0.0527***	0.125***	0.0408***	0.0556***	0.0487***
	(118.18)	(61.90)	(84.04)	(89.07)	(76.10)
$Tenure^2$	-0.00208***	-0.0101***	-0.00155***	-0.00210***	-0.00201***
	(-98.63)	(-35.24)	(-78.37)	(-74.71)	(-65.12)
Public Sect	-0.150***	-0.150***	-0.135***	-0.145***	-0.156***
	(-104.44)	(-75.65)	(-63.72)	(-77.26)	(-70.16)
Constant	-0.890***	-0.750***	-0.604***	-0.877***	-0.882***
	(-83.21)	(-51.34)	(-27.63)	(-63.92)	(-40.17)
Panel B:			Tests		
Underid F-stat	123.720	76.352	30.104	90.134	32.943
Weak id F-stat	124.483	76.676	30.235	90.884	33.068
Observations	1,254,939	549,698	705,241	661,370	588,672

* p<0.10, ** p<0.05, *** p<0.001

t statistics in parentheses. The sample contains female employees aged 16-50. All the specifications include individual and year fixed effects (not shown in the table). I also include (not shown) as additional controls in every specification a set of regional and two-digit industry dummies. Underid F-stat refers to Kleibergen-Paap rk LM statistic, and I use it to test whether my instrument is correlated with the endogenous regressor. Weak id F-stat refers to the Kleibergen-Paap rk Wald F statistic, and I use it to test whether my instrument is weak. I cluster standard errors at the individual level.

by 20.8%, but has a negligible impact on the fertility decision of young men. Columns 5-6 split the sample by level of qualification to further examine whether the career costs of childbearing are relevant on the impact that permanent employment has on the fertility decision. In particular, columns 5-6 respectively estimate the second-stage for the subsample of low-qualified and high-qualified males. Intuitively, the career costs of childbearing are higher for greater levels of education. Holding an open-ended contract increases the probability of low qualified males having a child in the following period by 8.75%, but has a negligible impact on the fertility decision of high qualified men. Overall, the estimates suggest that holding a permanent contract increases the probability of having a child in the following period by means of a higher job security. However, the effect vanishes when the career costs of childbearing are high. Using the probability of having a child at $t+2$ as dependent variable does not affect my findings.

Table 5 is identical to table 4, but for the sample of females. As shown in column 1, OLS estimates suggest that holding a permanent contract increases the probability of females having a child in the following period by 0.71%, which is higher than the OLS estimate obtained for males. However, the estimate becomes insignificant after using the subsidies as an instrument for permanent employment in column 2. This suggests that holding an open-ended contract has no impact on the fertility decision of females. Despite increasing job security, permanent employment may have no effect on the fertility behaviour of females due to the higher career costs of childbearing they hold. Columns 3-4 split the sample of females by age. Estimates of the impact of permanent employment on the fertility decision are insignificant for both young and mature women. Columns 5-6 split the sample of females by level of qualification. Estimates of permanent employment are again insignificant independently of the level of education of women. Overall, estimates suggest that holding an open-ended contract has no impact on the fertility decision of females. Using the probability of having a child at $t+2$ as dependent variable does not affect my findings.

It is also relevant to comment on the estimates of the rest of the covariates of my 2SLS specification in tables 4 and 5. First, fertility is concave in age, with estimates being significant at the 1% and 5% confidence level. Second, holding a full-time job increases the probability of females having a child in the next year. Whereas part-time contracts may improve the work-family balance, the choice of this type of employment may not be voluntary in the Spanish labour market. Third, an increase in the wage raises the opportunity cost of having a child, and therefore, has a negative impact on the fertility decision of males. Fourth, fertility is convex in the number of years that a male employee has been working for the same company. Finally, working for the public sector increases the probability of males having a child in the following period. Overall, 2SLS estimates of the impact of permanent employment on the fertility decision are consistent across the different samples and specifications.

Table 4: Results Second Stage for Males

	OLS	2SLS				
			Age		Level of qualification	
			Young	Mature	Low	High
Depvar: Fert$_{t+1}$	(1)	(2)	(3)	(4)	(5)	(6)
Perm Emp	0.00269***	0.0817**	-0.0334	0.208**	0.0875**	-0.0495
	(5.48)	(2.63)	(-0.93)	(2.60)	(2.68)	(-0.36)
Age	0.00764***	0.00421**	0.0000742	-0.0101***	0.00322**	0.0146*
	(45.06)	(3.09)	(0.05)	(-6.86)	(2.66)	(1.73)
Age^2	-0.000202***	-0.000137***	0.000409***	0.000119***	-0.000113***	-0.000348**
	(-64.14)	(-5.33)	(18.44)	(5.34)	(-4.89)	(-2.15)
Logwage	-0.000283	-0.00561**	0.00101	-0.0119**	-0.00573**	0.00419
	(-1.39)	(-2.67)	(0.52)	(-2.28)	(-2.96)	(0.38)
Full-time	0.000931	-0.00102	0.000461	-0.0120**	0.00102	0.00120
	(1.34)	(-0.97)	(0.66)	(-2.33)	(1.07)	(0.20)
Fert Grant	0.00145**	-0.000509	-0.000650	0.000224	-0.000781	0.00174
	(2.32)	(-0.51)	(-0.42)	(0.15)	(-0.67)	(0.69)
Tenure	0.000613***	-0.00332**	0.00254	-0.00782**	-0.00467**	0.00350
	(4.18)	(-2.14)	(0.59)	(-2.50)	(-2.60)	(0.64)
Tenure^2	-0.0000446***	0.000114*	-0.0000200	0.000288**	0.000172**	-0.000180
	(-6.86)	(1.82)	(-0.06)	(2.37)	(2.47)	(-0.77)
Public Sector	-0.000873*	0.00902**	-0.00488	0.0223**	0.00989**	-0.0106
	(-1.72)	(2.30)	(-1.05)	(2.45)	(2.56)	(-0.53)
Constant	-0.0235***	0.0286	-0.00980	0.210***	0.0384**	-0.112
	(-6.94)	(1.37)	(-0.45)	(6.92)	(2.12)	(-0.91)
Observations	1,848,746	1,848,746	717,764	1,130,982	1,199,075	641,558

* p<0.10, ** p<0.05, *** p<0.001

t-statistics in parentheses. The sample contains male employees aged 16-50. All the specifications include individual and year fixed effects (not shown in the table). I also include (not shown) a set of regional and two-digit industry dummies as additional controls in all the specifications. I cluster standard errors at the individual level.

Table 5: Results Second Stage for Females

	OLS	2SLS				
			Age		Level of qualification	
			Young	Mature	Low	High
Depvar: $Fert_{t+1}$	(1)	(2)	(3)	(4)	(5)	(6)
Perm Emp	0.00710***	-0.00449	-0.0920	-0.0759	0.0257	-0.0704
	(12.32)	(-0.09)	(-1.59)	(-0.71)	(0.49)	(-0.69)
Age	0.0101***	0.0107***	0.00247	-0.00674***	0.00613**	0.0195**
	(43.37)	(4.47)	(0.88)	(-4.49)	(2.65)	(3.17)
Age^2	-0.000253***	-0.000262***	0.000582***	0.0000931***	-0.000174***	-0.000456***
	(-59.93)	(-6.75)	(16.05)	(8.27)	(-5.46)	(-3.84)
Logwage	0.00288***	0.00379	0.00546	0.0149*	0.00136	0.00850
	(11.81)	(1.00)	(1.60)	(1.69)	(0.34)	(1.07)
Full-time	0.00485***	0.00491***	0.00133	0.00643***	0.00519***	0.00620**
	(7.61)	(7.27)	(1.39)	(3.46)	(4.75)	(2.10)
Fert Grant	-0.00126	-0.000974	0.00421*	0.0000235	-0.00132	-0.000777
	(-1.53)	(-0.67)	(1.69)	(0.01)	(-0.73)	(-0.33)
Tenure	0.00241***	0.00302	0.0143**	0.00398	0.00127	0.00603
	(12.98)	(1.18)	(1.97)	(0.91)	(0.43)	(1.21)
$Tenure^2$	-0.000109***	-0.000133	-0.000876	-0.000165	-0.0000402	-0.000285
	(-14.65)	(-1.32)	(-1.49)	(-0.99)	(-0.36)	(-1.39)
Public Sector	-0.00915***	-0.0109	-0.0229**	-0.0202	-0.00459	-0.0235
	(-13.86)	(-1.50)	(-2.63)	(-1.38)	(-0.60)	(-1.47)
Constant	-0.0872***	-0.0975**	-0.0865**	0.0222	-0.0391	-0.204**
	(-16.87)	(-2.24)	(-1.96)	(0.34)	(-0.84)	(-2.24)
Observations	1,254,939	1,254,939	549,698	705,241	661,370	588,672

* p<0.10, ** p<0.05, *** p<0.001

t-statistics in parentheses. The sample contains female employees aged 16-50. All the specifications include individual and year fixed effects (not shown in the table). I also include (not shown) a set of regional and two-digit industry dummies as additional controls in all the specifications. I cluster standard errors at the individual level.

6.3 Robustness

I next implement several robustness checks to test the sensitivity of the previous analysis. Estimates are found in table 6. Column 1 adopts a placebo test that evaluates whether holding an open-ended contract has an impact on the probability of males having a child in the following period, when an incorrect timing of the subsidies is used as an instrument. I assign subsidies at $t+1$ as instrument for permanent employment at t. Column 2 is identical to column 1, but for the sample of females. The estimate of the impact of permanent employment on the probability of having a child in the following period becomes negative and not statistically significant for both males and females.

Column 3 uses a 2SLS model analogous to my baseline specification, except that I control for age by using a set of age dummies of intervals of five years (e.g: a dummy for age 16-20, another for 21-25, and so on), instead of using age and age^2 as covariates. Column 4 is similar to column 3, but also includes second-order interactions between age dummies, and year and region dummies as additional controls. This allows me to take into consideration differences in trends over time, or discrepancies in time-invariant regional characteristics, among the groups of individuals with different ages. Estimates of the impact of permanent employment on the probability of males having a child in the following period are positive, significant at the 1% confidence level, and higher in magnitude than the coefficient obtained in the previous analysis. Columns 5-6 are identical to columns 3-4, but for the sample of females. Estimates of the effect of holding an open-ended contract at t on the probability of females having a child at $t+1$ are not statistically significant. This is consistent with the estimates obtained in the previous sections.

Finally, column 7 uses my baseline 2SLS specification to estimate the impact of permanent employment on the probability of having a child at $t+1$ for the sample of males aged 25-40. Column 8 repeats the same specification than the previous column, but for the sample of females aged 25-40. The two columns test whether my estimates are robust to using samples of individuals with different age ranges. Restricting my sample to ages at which individuals are more fertile increases the magnitude and significance of the estimate of permanent employment for males, but it remains insignificant for females. Overall, 2SLS estimates are robust across the different samples and specifications.

7 Aggregate Analysis

In this section of the paper, I estimate the causal impact of permanent employment on the fertility decision by using a different dataset consisting on administrative aggregate data at the municipality level. This allows me to quantify the magnitude of the impact of the policy on the labour market and fertility rates in Spain. The aggregate analysis also constitutes a second set of evidence of the impact of permanent employment on the fertility decision, and

Table 6: Robustness Checks

	Placebo tests		Alternative Specification				Sample 25-40	
	Males	Females	Males		Females		Males	Females
Depvar: Fertility$_{t+1}$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Perm Emp	-0.0425	-0.0137	0.168***	0.213***	-0.00514	0.0335	0.313***	0.126
	(-0.73)	(-0.23)	(5.17)	(3.90)	(-0.10)	(0.34)	(5.72)	(1.32)
Age	0.0101***	0.0123***					0.0149***	0.0273***
	(3.47)	(3.62)					(6.21)	(6.03)
Age^2	-0.000256***	-0.000293***					-0.000555***	-0.000901***
	(-4.60)	(-5.14)					(-10.34)	(-10.37)
Logwage	0.00276	0.00527	-0.0108***	-0.0139***	0.00465	0.000966	-0.0209***	-0.000677
	(0.71)	(1.16)	(-4.71)	(-3.84)	(1.12)	(0.13)	(-5.29)	(-0.09)
Full-time	0.00290	0.00478***	-0.00350**	-0.00478**	0.00457***	0.00438***	-0.0155***	0.00523**
	(1.21)	(4.10)	(-3.08)	(-3.00)	(6.83)	(5.93)	(-4.62)	(2.35)
Fert Grant	0.00335*	0.000283	-0.00268**	-0.00250*	-0.00113	-0.000639	-0.00373**	-0.00506**
	(1.88)	(0.15)	(-2.61)	(-1.90)	(-0.75)	(-0.27)	(-2.18)	(-2.16)
Tenure	0.00274	0.00298	-0.00771***	-0.0101***	0.00328	0.000913	-0.0188***	-0.00385
	(0.96)	(1.03)	(-4.56)	(-3.65)	(1.16)	(0.17)	(-5.22)	(-0.61)
Tenure^2	-0.000134	-0.000137	0.000290***	0.000390***	-0.000152	-0.0000441	0.000943***	0.000171
	(-1.11)	(-1.14)	(4.16)	(3.50)	(-1.33)	(-0.21)	(4.94)	(0.52)
Public Sector	-0.00664	-0.0142*	0.0203***	0.0259***	-0.0104	-0.00489	0.0375***	0.00307
	(-0.93)	(-1.67)	(4.96)	(3.75)	(-1.33)	(-0.33)	(5.47)	(0.21)
Age dummies?	No	No	Yes	Yes	Yes	Yes	No	No
Age dummies*Region FE?	No	No	No	Yes	No	Yes	No	No
Age dummies*Year FE?	No	No	No	Yes	No	Yes	No	No
Observations	1,511,721	1,001,476	1,821,009	1,821,009	1,228,601	1,228,601	1,045,067	740,196

* p<0.10, ** p<0.05, *** p<0.001

t statistics in parentheses. The sample contains employees aged 16-50. All the columns include individual and year fixed effects (not shown in the table). I also include (not shown) a set of regional and two-digit industry dummies as additional controls in every column. Columns 3 and 5 include a set of age dummies of intervals of five years instead of controlling for age and age^2. Columns 4 and 6 include second-order interactions between the age dummies, and the year and regional dummies. I cluster standard errors at the individual level.

adds robustness to the previous analysis.

7.1 Aggregate Data

My aggregate administrative dataset contains information on the total number of births and labour contracts that took place in each of the 8,124 Spanish municipalities in every year during the period 1997-2004. I construct it from three different sources. First, labour market data was provided by the Spanish Public State Employment Service (SEPE), and contains information on the number of contracts created at the municipality level, by type of contract. It also specifies on the number of contracts created for different groups of the population, classified by age and gender. Second, fertility and sociodemographic data was provided by the National Statistical Institute (INE), and contains information on the number of births, fetal deaths, marriages, deaths, and proportion of immigrants at the municipality level. It also gives information on the female labour market participation rate, unemployment rate, and growth of the GDP at the province level.[5] Finally, I obtain information on the school attendance rate of children aged 0 to 2 years old, at the province level, from the Spanish Ministry of Education.

I restrict the analysis to the period 1997-2004 due to data availability. I also exclude municipalities where the number of permanent contracts created is higher than the working-age population.[6] This drops 150 observations, which represents 0.2% of my total sample size. Finally, I exclude municipalities where the number of births is higher than the childbearing population.[7] This drops 22 observations, which represents 0.03% of my total sample size. Overall, this sample selection results in a panel that contains 64,816 observations of 8,108 Spanish municipalities. A possible concern of using aggregate data is that estimates may be subject to aggregation bias. Nonetheless, this problem is minimized by using the municipality level as unit of analysis, which is the finest Spanish urban administrative division.

7.2 Aggregate Analysis Empirical Strategy

Using my aggregate dataset, I estimate the causal impact of permanent employment on the fertility decision by adopting a 2SLS specification that takes the following form:

$$PE_{m,t} = \omega + \pi S_{m,t} + \eta X_{m,t} + \tau Y_{p,t} + \psi Z_{j,t} + \theta_t + \mu_m + \nu_{m,t} \quad (3)$$

$$F_{m,t+1} = \alpha + \beta PE_{m,t} + \phi X_{m,t} + \gamma Y_{p,t} + \zeta Z_{j,t} + \lambda_t + \delta_m + \varepsilon_{m,t} \quad (4)$$

where $F_{m,t+1}$ is the number of births per 1,000 childbearing population

[5] There are 52 provinces in Spain.

[6] I define working-age population as the population aged 16-69

[7] I define childbearing population as the population aged 16-45

in municipality m at time $t+1$. $PE_{m,t}$ is the number of open-ended contracts created per 1,000 childbearing population in municipality m at time t. $S_{m,t}$ is the average subsidy for which the inhabitants of municipality m at time t were eligible. It is measured in terms of the percentage of labour costs saved during the first year of open-ended contracts. Details of how I have constructed this variable can be found in appendix A. $S_{m,t}$ varies across municipalities (indexed by m), and year of hire (indexed by t). $X_{m,t}$, $Y_{p,t}$ and $Z_{j,t}$ are vectors of time-varying covariates at the municipal, provincial, and regional level, respectively. The reason why I control for time-varying covariates at three different geographical levels is that data is not always available at the municipality level. θ_t are year fixed effects, μ_m are municipality fixed effects to capture unobserved time-invariant characteristics, and $\nu_{m,t}$ is a municipality and time specific level error term. In my empirical analysis, I cluster standard errors at the regional level to allow for an arbitrary correlation of residuals within regions.[8]

Overall, I estimate the response of fertility rates at $t+1$ to the creation of permanent employment at t, by adopting a 2SLS specification where $S_{m,t}$ is used as instrument for permanent employment creation rate. The identifying assumption is that, conditional on observable time-varying covariates, municipality, and year fixed effects, my instrument $S_{m,t}$ is not correlated with $\varepsilon_{m,t}$. A first concern to the previous is that subsidies may have been correlated with the provision of other public services that affect the fertility decision. For example, those regional governments subsidizing permanent employment might have also provided more free pre-school education,[9] better maternity services in the health system, or directly subsidized childbearing. Intuitively, an improvement in these public services has a positive impact on the fertility decision. I take into consideration the previous by controlling for the proportion of children aged 0-2 that are attending school in province p at time t,[10] the fetal death rate in municipality m at time $t+1$,[11] and a dummy that takes value 1 when a municipality is within a region that is subsidizing fertility at time t. A second concern is that fertility rates and the provision of subsidies may have been driven by economic growth, or may have been correlated with sociodemographic characteristics of the population.[12] I address this by controlling for the growth of GDP of province p at time t, and the proportion of immigrant population of municipality m at time t.[13]

[8] There are 17 regions in Spain.

[9] Previous research has shown the importance of welfare state support to reconciliate the work-family balance (Esping-Andersen et al, 2003), with female participation in the labour market being higher as the proportion of 3-year-old children enrolled in public childcare increases (Nollenberg et al, 2011).

[10] The proportion of children aged 0-2 attending school is calculated as the number of children aged 0-2 attending school divided by the total number of children aged 0-2 in province p at time t

[11] Fetal death rate is calculated as the number of babies that die at birth divided by the total number of births in municipality m at time $t+1$

[12] Regional governments usually conditioned the eligibility of a firm for the subsidies on the age and gender of the employee hired by the company

[13] The proportion of immigrant population is calculated as the number of foreign individuals divided by the total population of municipality m at time t

7.3 Quantifying the Magnitude of the Impact of the Policy

Table 7 presents the estimates of the aggregate analysis. Columns 1 and 2 study the impact of the subsidies on the labour market. As shown in column 1, a decrease of 10% in the labour costs of the first year of open-ended contracts reduces by 9.18 the number of temporary contracts created per 1,000 population of childbearing age. The estimate is significant at the 5% confidence level. Column 2 displays the estimates of the first-stage equation (3), and studies the impact of the subsidies on permanent employment. As shown, a 10% decrease in the labour costs of the first year of new open-ended contracts increases by 0.65 the number of permanent contracts created per 1,000 population of childbearing age. The estimate is significant at the 5% confidence level, and the F-statistic of the instrument is 11.65. Estimates remain significant if I cluster the standard errors at the province or municipality level.

Taking into account that the average subsidy reduced the labour costs of the first year of open-ended contracts by 24% (García-Pérez and Rebollo-Sanz, 2009), and that there was approximately a 19 million population of childbearing age in Spain in 2004, I calculate that the policy created 29,640 permanent contracts for the population of childbearing age. Therefore, the policy raised the creation of open-ended contracts, but this was not driven by an increase in the creation of total employment, but at the cost of reducing the use of temporary contracts.

Columns 3-4 respectively show the OLS and 2SLS estimates of equation (4), for comparison. The OLS estimate suggests that the creation of 1,000 additional permanent contracts increases the number of births by 7.18 in the following period. The estimate is significant at the 10% confidence level. Using subsidies to open-ended contracts as instrument for permanent employment creation rate increases both the magnitude and significance of the estimate. In particular, the 2SLS estimate becomes 275 for the same rise in permanent employment, and it is significant at the 5% confidence level. This points that the policy increased by 8,150 the number of births in Spain. The bigger magnitude of the 2SLS estimate suggests, as in previous sections, the presence of a strong downward bias in the OLS estimate of the impact of permanent employment on the fertility decision. Possible causes of the bias have been already discussed.

It is important to interpret the rest of covariates included in my 2SLS specification. Not surprisingly, a better health system increases fertility rates in the following period, with the estimate being significant at the 1% confidence level. Better economic performance, however, has a negative impact on the fertility decision. This may be explained by the opportunity cost of childbearing increasing as a response of an improvement in the career prospects during economic expansions. Estimates of childcare and the proportion of immigrant population are not statistically significant. In summary, the policy increased the use of permanent employment, which had a positive effect on the fertility rates in the short run.

8 Conclusions

This paper studies the impact of permanent employment on the fertility decision. To identify a causal effect, I exploit exogenous changes in the subsidies to use open-ended contracts that were given by some of the Spanish regional governments during the period 1997-2004. This induces a quasi-natural experiment that takes advantage of four levels of variation in the amounts of the subsidies: (i) across regions and (ii) over time, as well as (iii) by gender and (iv) age of the temporary employee whose contract is converted into a permanent one. I adopt the subsidies as an instrument for permanent employment. Using a 2SLS specification, I firstly study whether the public expenditure allocation into these subsidies (0.28% of Spanish GDP) generated permanent employment, and, in a second step, I estimate the causal impact of permanent employment on the fertility decision. I give two sets of evidence of the previous by performing two separate analyses that respectively use individual and aggregate data. The micro results obtained are consistent with the estimates of the aggregate analysis.

A couple of findings are obtained. First, subsidies to use open-ended contracts had a positive impact on the presence of permanent employment. In particular, a decrease of 10% in the labour costs of the first year of new open-ended contracts raises the probability of holding a permanent contract by 0.39% for males and 0.34% for females. Using my aggregate analysis, I estimate that the policy created 29,640 open-ended contracts in Spain. Second, I find that holding a permanent contract increases the probability of males having a child in the following period by 8.17%, but has a negligible effect on the fertility decision of females. I obtain similar estimates when I study the impact of holding an open-ended contract on the probability of having a child two years after. Permanent employment has a positive effect on the fertility decision of males by means of a higher job security, but has no impact on the fertility behaviour of females because of the higher career costs of childbearing they hold. I split my sample by age and level of qualification to further examine whether the career costs of childbearing play a role on the effect that permanent employment has on the fertility decision. Holding an open-ended contract increases the probability of having a child in the following period for the subsamples of mature and low-qualified men, but has no impact on the fertility decision of high-qualified and young males. Intuitively, the career costs of childbearing are higher for greater levels of education, and also at the stage of the life cycle when individuals are investing more in their career development. Using my aggregate analysis, I conclude that the overall impact of permanent employment on the fertility decision is positive, and that the policy increased the number of births in Spain by 8,150. The estimates are robust across different specifications.

Some caution is needed in the interpretation of the results. Having a different labour market context, or a distinct degree of governmental involvement

Table 7: Estimates of the First and Second Stages of the Aggregate Analysis

		First-stage	Second-stage	
			OLS	2SLS
Depvar:	Temp Emp	Perm Emp	Fert rate$_{t+1}$	Fert rate$_{t+1}$
	(1)	(2)	(3)	(4)
Subsidy	-0.918**	0.0653**		
	(-2.47)	(3.41)		
Perm Emp Rate			0.00718*	0.275**
			(1.93)	(2.57)
Fert Death Rate$_{t+1}$	0.0269	-0.00241	-0.00778***	-0.00716***
	(0.76)	(-1.13)	(-4.26)	(-3.45)
Fert Grant	-39.71**	2.577	0.311	-0.403
	(-2.28)	(1.08)	(0.60)	(-0.74)
School Attendance Rate	1.464	0.0503	0.0556	0.0274
	(0.84)	(0.67)	(1.42)	(0.59)
Foreign Pop Rate	-0.616**	-0.0100	-0.00300	-0.00139
	(-3.51)	(-0.60)	(-0.55)	(-0.25)
Growth GDP	1.039	-0.0996	-0.105***	-0.0762**
	(0.69)	(-1.13)	(-5.33)	(-3.02)
F-test of instrument		11.65		
Constant	294.7***	19.15***	15.87***	10.69***
	(11.56)	(13.34)	(57.63)	(5.69)
Observations	57,289	57,289	57,289	57,289

* p<0.10, ** p<0.05, *** p<0.001

t statistics in parentheses. The sample contains information on every labour contract and birth episode that occurred in Spain from 1997 to 2004, aggregated at the municipality level. All the specifications include municipality and year fixed effects (not shown in the table). F-test of instrument refers to the Kleibergen-Paap rk Wald F statistic, and I use it to test whether my instrument is weak. I cluster standard errors at the regional level.

in policies to promote the work-family balance, may result in permanent employment having a different impact on the fertility decision than the estimates obtained in this paper. On the one hand, the higher the public support to conciliate the work-family balance, the lower the career costs implicit in childbearing. This may result in permanent employment having a higher impact on the fertility behaviour, or in this effect being homogeneous across genders, ages, and levels of education. On the other hand, periods of low unemployment may lead to employees valuing less job security, as it would be relatively easy for them to find another job in the case of being fired. As a result, permanent employment may have a lower impact on the fertility decision than the estimates obtained in the paper.

Appendices

A Appendix

Higher subsidies were generally given to individuals younger than 30, older than 45, and to females. I follow several steps to construct my variable $S_{m,t}$. First, I calculate the population of four different sociodemographic groups: males younger than 30, males aged 30-45, females younger than 30 and females aged 30-45. Second, I assign to these groups their respective amount of the subsidy in each region and year. Third, I calculate $S_{m,t}$ as a weighted average of the different amounts of the subsidies that were given to these groups in region j at time t. This is measured in thousands of euros. The weights used to calculate this average are the ratios between the number of individuals of each sociodemographic group and the total population of childbearing age in municipality m at year 1996. I construct weights using the populations of year 1996 because this was the last year before the subsidies to open-ended contracts started to be implemented. Therefore, 1996 is the last year when the distribution of the population of the municipalities is exogenous to the policy. More formally, I calculate $S_{m,t}$ using the following expression:

$$S_{m,t} = \sum_{g=1}^{4} (Pop_{g,m,96}/TotchildbearingPop_{m,96}) * Subsidy_{g,j,t} \qquad (5)$$

where g refers to sociodemographic group, m to municipality, j to region and t to year. Finally, I divide the previous by the average labour costs of region j at time t. By doing this, I measure my variable $S_{m,t}$ in terms of the percentage of the labour cost saved during the first year of new open-ended contracts.

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