Abstract

The main purpose of this paper is to show how the labour market affects Spanish individual fertility decisions. Spain is an interesting case due to its huge fertility decline. Our hypothesis is that precarious Spanish labour markets (i.e. high unemployment rates and fixed-term contracts) postpone childbearing. We test if female employment (full and part-time) is a barrier for family formation. The study is done for a sample of both men and women. We analyse two groups, *Cohort 1945–60* and *Cohort 1961–77* in order to capture social changes. The paper focuses on the timing of marriage and the birth of a first, second and third child using a Cox hazard approach. Results show that female employment delays marriage in *Cohort 1945–60* but it has a reverse effect in *Cohort 1961–77*. We also find that employed women (regardless of the number of hours) postpone first and second birth in any cohort, even accounting for any potential endogeneity between fertility and participation. Female labour market instability plays an important role in family formation, especially by putting off marriage. From our male sample analysis we learn that male unemployment, at the individual level, impacts negatively on fertility only through delaying marriage.

JEL Classification: I20, J12, J13, J18, J20
Key words: duration models, fertility, labour market, education

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The Impact of the Labour Market on the Timing of Marriage and Births in Spain

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1 Introduction

The main purpose of this paper is to show how the labour market, education and other characteristics affect the individual decision to marry and have children in Spain. Our motivation is to learn more about the decline in Spanish fertility by checking empirically some of the ideas developed in the theory to explain family formation. Do higher educated women experience a greater opportunity cost of having children? Is the fact of being employed a constraint on having children for Spanish women? Is this constraint reduced if women work part-time? Do female unemployment rates and temporary contracts cause a postponement of marriage and births leading to a decline in fertility? Is it true that high external income facilitates the expansion of the family? How do social and demographic variables affect the timing of marriage and births? The analysis is done for two groups, the old cohort (women born 1945–60) and young cohort (1961–77) since the role of women in society, especially as a worker, was quite different in these two periods. We also examine the role of men in family formation by looking at a male sample.

Although some studies have been done on this topic (see Section 2), we believe that there is scope for further research, especially for the Spanish case. The starting point of the decline of the Spanish birth rate dates back to the late 1970s. Nowadays, fertility rates in Spain are lower than in any other country in the EU, except for Italy. In 2001, the US Bureau of Census reported that fertility rates were the following: Spain (1.15), Italy (1.18), Sweden (1.53), the Netherlands (1.65), UK (1.72) and US (2.06).

Low fertility rates have both social and economic origin. There exists a negative relationship between the number of hours supplied in the labour market and the number of children in the household across individuals. Female education is also linked to having fewer children, both through its effect on employment opportunities and on the use of contraceptive methods.

Part of the sharp decrease in Spanish fertility is due to the fact that women are now more educated and they are entering the labour market in larger numbers. However, other countries also experienced this phenomenon (some time before) but their fertility rates never fell to the current levels in Spain (e.g. see Figure 7 in Appendix C). This means that, although some percentage of the decline can be explained by mass entry into the labour force and the rise of education, one should also look for other possible reasons. This is what makes the Spanish case (together with other Southern European countries) particularly interesting.

One hypothesis is that countries such as the US, the Netherlands and Sweden achieved a higher stable fertility rate (after their initial decline) than that in Spain thanks to their more flexible labour markets and their government policies. This means that in these countries being employed places less of a constraint on women having children. Moreover, they are characterised by lower unemployment rates and fewer temporary contracts, which allows them to marry (or cohabit) at a younger age.

The increase in education does cause a reduction in the willingness to have a child. How-

ever, what other nations have attained is what is called the 'two-child norm' (Hoem and Hoem (1989)). In general, women start building a family at an older age compared to previous cohorts but they end up with two children. This suggests that further female education explains part of the decline of the Spanish fertility rates but not all. The impact of the level of education on the drop in fertility is strongly linked to the structure of the labour market, that is, how flexible it is and how many opportunities it offers. In other words, if the Spanish labour market were more similar to that in other countries, then Spanish couples would probably form their own households before they currently do and educated women would end up with the same two-child norm.

The previous statement is particularly true with regards to the US. Many American women go to university, work and have children. They know that the market offers them alternative chances after the birth of their children. Spanish women perceive a greater opportunity cost of becoming pregnant at equivalent US educational levels since work opportunities for mothers are scarce. Spanish unemployment rates are huge and by the time they get a permanent contract, which facilitates stability, they are already in their mid-thirties. In 1984, the government decided to liberalize the labour market because of the rise in unemployment (Saint-Paul (2000)). However, rather than reducing dismissal costs for permanent workers, which is politically difficult to implement, they increased the use of temporary labour contracts. The result of this reform was that temporary contracts represent 95% of new hires. Later on, it was shown that this policy had not succeeded in its objective of reducing unemployment. Even if initially, there was a boost in hiring, in the following recession (mid-nineties) employment dropped rapidly since firms could take advantage of the temporary contracts and easily get rid of their workers. This attempt to increase flexibility basically affected young people and consequently, young potential couples. Without a stable employment contract, they were not willing to start a family. Thus, the labour market differences ensure that women with equivalent schooling are willing to have a child in the US but are reluctant to do so in Spain.

US fertility rates stabilised with many mothers working full-time whereas in the Netherlands they did with many women working part-time. The Netherlands has been taken as an example of a country where the labour market is flexible and people can voluntarily decide to work part-time. Under the latter option, women are able to combine both working and having children. In the Dutch society it is understood that either women or men take some time off in order to take care of their children, and companies are willing to offer this free choice.

Sweden finally exemplifies the intervention of the government in childcare policy. This can be another alternative that helps prevent the observed Spanish tendency towards lower fertility. Both private and public Swedish companies are characterised by their provision of childcare and maternity leave. Moreover, the atmosphere in the labour market is such that firms are more willing to employ potential mothers.

To summarise, it is true that part of the recent drop in Spanish fertility rates can be explained by factors similar to those experienced by other countries. The additional drop is due to the fact that educated women who wish to combine work with raising a family are

discouraged from doing so by the labour market structure. The opportunity cost of having children at similar schooling levels is greater in Spain than in other countries because of high unemployment and labour market instability. As such, we argue that the structure of the labour market has an important role in explaining the phenomenon of low fertility in Spain. Fewer couples decide to marry, and they do it later. Furthermore, among married women, more remain without children since they are afraid of losing their careers.

We would like to clarify that the aim of this study is not to explain differences in fertility across countries. This goes beyond the purpose of our analysis. We do not investigate how socio-economic explanatory variables impact on the timing of family formation in other countries either.[1] The contribution of our paper is to provide further knowledge about fertility decisions only in the Spanish case.

The paper is organised as follows: in Section 2, we summarize the contribution of other authors on this topic. In Section 3 we introduce the methodology applied. Section 4 explains our data sources and explanatory variables. In Section 5 we describe some demographic features such as age of marriage, number of children per cohort and mothers' participation. We next focus on our model in Section 6. The aim is to analyse the timing of family formation with a hazard approach. We propose alternative estimations in Section 7 in order to overcome issues such as endogeneity between fertility and female participation. In Section 8 results are discussed, both for the female and the male sample. We then summarise our findings and conclude in Section 9.

2 Related Literature

There are several papers that provide evidence at microeconomic level on how observable characteristics, mainly female employment and education, affect women's fertility timing.

For the Scandinavian welfare states, Hoem and Hoem (1989) analyse the effect of women's employment on second and third births in Sweden. They find that those variables with greatest impact on the hazard for the second birth are a woman's employment status, her educational level, and whether she is cohabiting or is married. When looking at the third birth, the following regressors are found to be important: age at first birth and the elapsed interval between her first two births (demographic characteristics). Their marital status seems to be minor for the third birth. Their paper emphasises the preference of two children (two-child norm) in modern Sweden. They also describe the role of the Swedish public sector, which has improved job opportunities for women and has enabled both partners to combine homemaking with paid employment. This has enabled 80% of women with children in the kindergarten to work, many of them part-time. Surprisingly, they find no significant difference on the effect of working full or part-time on the hazard. One initially would think that more family oriented women tend to work part-time. They justify the result by an income explanation. Couples with women working full-time have a higher income and can afford to have more children. More recently, Kravdal (2000)

[1] Comparison with other countries is important in this context. In order to cover this gap, we are currently extending our duration analysis for other countries in a related paper.

studies the effect of unemployment, both at micro and macro level, on fertility in Norway between 1991 and 1998. She finds that unemployment has had a weak impact on births, which might be due to the fact that people are supported by a generous welfare system.

There are also studies for market-oriented economies. The paper by Harvey (1996) analyses the effect of female employment on the likelihood and timing of second and higher order pregnancies for the US. The author uses pregnancy as the unit of measure since he thinks that it is pregnancy and not birth that employed women try to avoid. The paper finds an important negative impact of full-time[2] employment on fertility for the second and fourth pregnancies, but not so for the third pregnancy. This suggests that something other than employment may be more crucial in determining the probability of a third than a second or fourth one for women who work full-time. Also for the US, Hodson and Mooney (1981) write about the effects of the timing of marriage and first birth on the spacing of subsequent births. There are several factors that relate age at marriage with fertility. For example, fecundity has its peak at early ages and contraceptive methods will be expected to be used more effectively by older couples since they are more mature. The authors point out some aspects that make the relationship between the timing of marriage and first birth and subsequent child spacing misleading. For instance, those who use ineffective contraceptive methods are likely to marry earlier because they are induced to do so because of premarital conception. The results of their paper show that there exists a direct relationship between the number of births and the experience of rapid fertility. For example, about 80% of those who had three children at the time of the interview had their first child within two years of marriage, but only 35% of those who had one child at the time of the survey had that child within two years after marriage. The latter is rejected by Heckman, Hotz and Walker (1985),[3] which investigate whether it is true that the timing of marriage and the lengths of prior intervals affect the spacing of subsequent births once they control for unobserved heterogeneity. In fact, they find that if unobserved heterogeneity is taken into account, the pattern that longer preceding birth interval causes longer subsequent birth intervals' disappears. Groat, Neal and Workman (1996) analyse the family formation of working mothers in the US. They find that the longer the marital work duration, the longer the interval between marriage and first child. Another result is that the lowest fertility level is among mothers who have worked the greatest proportions of their married lives, at high status jobs, and before the birth of the first child. Cooman, Ermisch and Joshi (1987) focus on the probability of a birth given income in England and Wales. Their model confirms that not only demographic characteristics but also economic variables are important in explaining the fluctuations in fertility, in particular its timing. Del Bono (2001) has recently contributed into this area by looking at the impact of unemployment and employment expectations on fertility in the UK. She finds that a spell of unemployment induces women to delay childbearing. Those women who expect high future wages are more likely to postpone first birth, ceteris paribus. On the other hand, if women predict more favourable job opportunities, they bring forward the birth event.

After German unification, fertility patterns changed considerably in East Germany. Kreyen-

[2]Part-time employment impacts negatively but it is not significant.

[3]Their analysis is based on a Swedish sample.

feld (2000) analyses the impact of unemployment at micro level on the timing of first birth. Her paper concludes that spells on female unemployment actually increase the hazard for first birth in East-Germany, which goes in opposite direction of what Del Bono (2001) finds for the UK.

Less research has been done for Spain. We are aware of an important piece of work by Ahn and Mira (2001) who use the 1991 Spanish Socio-demographic Survey. They look at the the links between high male unemployment rates and the decline in fertility in Spain. Their results provide strong evidence that periods of non-employment have a significant negative effect on the probability of marriage. Part-time or temporary contracts have also played a negative role, which suggests that the instability of jobs among young men causes the delay of marriage and childbearing among the Spanish couples. Our analysis differs from theirs in several aspects. We focus on both females and males whereas they only investigate males. We also highlight changes in society by dividing our sample into two cohorts (1945–60 and 1961–77). Baizán, Aassve and Billari (2001) contributes to the Spanish case by modelling simultaneously first birth and union formation. They find evidence that these two events are correlated. Consequently, they claim that in order to obtain reliable estimates, studies should include a heterogeneity component that accounts for their mutual dependence. Looking at the economic variables, their results show that being employed reduces women's likelihood of marriage and first birth. The latter is true regardless they take account of the unobserved factor influencing simultaneously first birth and first union.[4]

3 Methodology

Our purpose is to analyse the principal determinants of the decisions to get married and to have children. Since we are interested in the impact of employment, education and labour market characteristics on these decisions, we will mainly focus on these variables. To analyse the process, we model the timing between different demographic states (single to married, married without children to one child, from one child to two children and from two to three). The tool applied to study the timing of marriage and births is the duration model. Econometric duration models are used to analyse the main factors (observable and non-observable) that determine the duration in a given state. In other words, they analyse the probability of an event occurring at a particular time, given that the individual was at risk at that time. Fertility decisions are based on sociological factors, demographic characteristics, education and the employment trajectories. The hazard model applied to family creation tells us, given employment, education and other factors, the probability that a woman will get married in the next month. When looking at the first child, it predicts the probability that a woman at risk with those characteristics will have a first child in the next month. The same interpretation is extended for the second and third child.

[4]We would like to point out, however, that the impact of economic variables (e.g. education, employment and work experience) remains fairly constant with the same interpretation in the two specifications (with and without accounting for interdependence). Thus, we believe that if one is interested in the impact of this type of covariate, one need not be overly concerned about correlations between first birth and marriage in Spain.

To summarize, these microeconomic models allow us to study how observable characteristics influence positively or negatively the chances that a woman gets married or increases the size of her family. These covariates can be either time varying or fixed. Since we are interested in how the employment and education path affects the family creation trajectory, we do have time-varying variables, which tell us at each period the employment status and the educational attainment of the woman. We also introduce regional unemployment rates that correspond to a particular month. This provides a measure of how a woman forecasts the risk of temporarily abandoning her job and how the economy is performing. Moreover, there are also some social factors that influence the hazard, which are taken as constant covariates (for instance, the number of siblings, religion and region). The hazard is not only a function of characteristics but also of the time a woman has already spent in a certain state.

4 Data and Covariates

The data come from the 'Family and Fertility Survey', a data set collected by the Centro de Investigaciones Sociolólgicas (CIS) between June and November of 1995. The structure of the questionnaire was originally produced by the United Nations and it was applied in Spain in 1995. The sample is built at the national level with individuals aged between 18 and 49 years old. The number of valid interviews was 4021 for women and 1991 men, obtained with a percentage of responses of 83.6% and 77% respectively.

CIS questioned women in the 17 regions (Comunidades Autónomas) in proportion to the population. Each individual responds to the survey at a particular moment of time. Then, she is asked to give information about her past. That is, the poll asks every woman to build up her history: for instance, the dates of her marriage, first cohabitation, sequence of jobs (starting and ending date of her job for up to 30 different employments), calendar of children born and sequence of schooling (up to 10 different courses). In consequence, since it is a retrospective survey there will be errors coming from the individuals' lack of memory.

In particular, we are interested in building the timing of their marriage and fertility, their job career and schooling in order to link the paths. The purpose is to figure out monthly whether the female is single, married without family, or has one, two or more children. Furthermore, we need to know the employment status and education achieved in that month. The starting point of the timing is 15 years. That is, when the person is 15 years old, she is deemed to be in period 0. One month later, she is in period 1, and one year later she is in period 12. The reason why the counter begins at 15 is that initially we model the duration to marriage. Since the unit of time is taken monthly, it makes sense to initiate the timing at 15 years. There were only three persons in my sample who had married before. These cases were discarded.

The variables used in the analysis include time-varying dummy variables that reveal the employment status of the woman at each month *Emplo*. That is, *Emplo* takes value one if the person was employed at the beginning of each period and zero otherwise. The variable

Schm is one if the individual is at school and zero if not. For reasons we will explain later, we have constructed lag variables of *Emplo* and *Schm* for six and twelve months (*Emplo6*, *Emplo12*, *Schm6*, *Schm12*). Furthermore, since we are interested in timing, we have dummy variables for education that tells us the highest level the person had achieved by that specific month. Because of the structure of the questionnaire, we are able to know if the woman is studying a certain degree in that month and if she succeeded. Therefore, the variable created takes the value of the degree at that month if she passed the degree, and the inferior level if she did not. The scale of the degrees goes from zero to six in accord with the International Standard Classification of Education (ISCED). Level 0 starts at the age of 3, 4 or 5 and it lasts from one to three years. Category 1 in the ISCED refers to primary education and normally starts at the age of 5, 6 or 7 and continues five years. Levels 2 and 3 belong to the secondary school, to the first and second cycle (starting at 11 or 12, and 14 or 15, respectively). Level 4 is generally achieved four years after the individual is 17 or 18 and it is a vocational degree. Finally, categories 5 and 6 refer to a university degree and postgraduate degree, respectively. From this variable, we have constructed four dummy variables *E1* (with value one if the maximum level is 0 or 1), *E2* (one if the individual belongs to category 2 or 3), *E3Voc* (one if she has level 4) and *E3GrPo* (one if she is at 5 or 6).

Furthermore, there are other time-varying variables that provide information about the occupational history of each female. First of all, in order to check if it makes a difference for the analysis to work part or full time we have created the following three dummy variables: *NonE* is one if at that month the woman is not employed at all; *FTE* is one if the woman is employed 35 or more hours and *PTE* is one if she is employed less than 35 hours.

We believe that the evolution of unemployment has had a great impact on the fertility trajectory. The variable *Unemrf* links the regional female unemployment rate to a particular individual date. That is, if month 30 of individual x is May of 1978, *Unemrf* is the regional unemployment rate of that quarter. Unfortunately, regional time series are available only from the second quarter of 1976 (Instituto Nacional de Estadistica). Thus, prior to this date, we have computed the earliest regional unemployment rates in the following way. We take the ratio between each regional unemployment rate and the national unemployment rate in the earliest quarter available (third term of 1976). The regional to national unemployment ratio is assumed to be constant through time. Since there exists data on national unemployment rates, we can use these constant ratios to estimate the regional unemployment rates. For the same reason as *Emplo* and *Schm*, we construct *Unemrf6* and *Unemrf12*.

The atmosphere of job security also influences the decision to build a family. In 1984, the Spanish government introduced a policy to liberalize the labour market, Following this reform, by 1990 temporary contracts accounted for 95% of new hires and 30% of employment. For this reason, we have included a variable that measures the percentage of female employees that have temporary contracts *Tempf* at national level. The lags of this covariate are *Tempf6* and *Tempf12*. This variable takes the value zero for quarters prior to 1984 since there were then no temporary contracts in Spain. Despite the fact this form of contract was initiated in 1984, there is no data available on number of em-

ployees under each type of contract before the second quarter of 1987. Thus, we have computed the missing values assuming the number of temporal contracts grew linearly from zero in the first quarter of 1984 to the number existing in the second quarter of 1987.

The rest of the explanatory variables are constant along the segment of a woman's life subject to study. These are social background factors such as the number of siblings (*Sibling*), if her parents were divorced (*DivPar*), if she is religious (*Religious*) and the region where she is living. The latter has been constructed in seven dummy variables following the NUTS categorization.[5] There is no information on moving region. This is the reason why it is taken as a fixed covariate, enforced by the fact that Spain is not characterised by high migration. The region where a woman is living at the interview date is probably the place where she has settled her life. We incorporate a variable for the taste for work (*WorkTaste*) that takes value one if the person was at work one year after she completed education. Cohort dummies are included with five years' intervals.

When studying the timing to the first child, we incorporate further fixed variables. Age of marriage *AgeMa*, which is accounted as months from the fifteenth birthday and education achieved by the partner (*E1P*, *E2P*, *E3VocP* and *E3GrPoP*) in dummy variables.

In the analysis of timing to the second child, apart from the partner's education, there is the age at first birth (*AgeAt1C*), the duration between the marriage and the first birth (*MenT1C*) and a dummy variable equal to 1 when the first child was a girl (*Girl*).

Finally, when looking at the third birth, the extra variables are age at second birth (*AgeAt2C*), the duration of the previous spell (*MenT2C*) and two dummy variables that take value 1 if the first two children were girls (*TwoGirls*) or boys (*TwoBoys*).

In the analysis of the probability of leaving the single state, individuals are censored at the date of the interview if they did not marry before. Period zero corresponds to the fifteenth birthday and the unit of time is months. Individuals who married before that time have been removed from the sample. For the estimation of the probability of having a first child, individuals were censored at the date of the interview, or at the time one of the members of the couple had had an operation to make pregnancy impossible. They were also censored at the time they separated, divorced or widowed. The same criterion was followed for the second and third child. Mothers who gave birth to twins were dropped out from the sample as well as births before the marriage.

One might think that, rather than being employed or not some time before the pregnancy or marriage, what really matters is the way a woman perceives her chances of getting back to work. This is the reason why we have constructed a variable that tells us the probability that a woman will be employed given her education and labour market behaviour. In order to compute the chances of this re-employment proxy, we have estimated a probit. The dependent variable takes value 1 if employed and 0 otherwise. Ideally, we

[5]NW (Galicia, Principado de Asturias, Cantabria); NE (País Vasco, Navarra, La Rioja y Aragón); C (Castilla León, Castilla la Mancha y Extremadura); CMadrid; E (Catalunya, Comunidad Valenciana, Baleares); S (Andalucía y Murcia); Canaries.

Table 1: Number of Subjects in Cohort 1945–60

	Marriage	1^{st} *Birth*	2^{nd} *Birth*	3^{rd} *Birth*
Total	1150	1041	1007	824
Exits	1072	1011	857	338
Censored	68	30	150	486

Table 2: Number of Subjects in Cohort 1961–77

	Marriage	1^{st} *Birth*	2^{nd} *Birth*	3^{rd} *Birth*
Total	2228	1024	821	436
Exits	1082	829	444	74
Censored	1146	195	377	362

would like to be able to set the dependent variable 0 when the person is unemployed (i.e. to compute the probability of employment given she is in the labour force), but in the data one is not able to distinguish between inactivity and unemployment.

Table 1 summarises the number of subjects, both who exit[6] and are censored, for the old cohort (born in 1945–60). Table 2 gives the same information for the young cohort (born in 1961–77).

5 Descriptive Statistics

Data show a postponing in the age of marriage. In the old cohort, by the age of 30, 93.4% of them were married whereas only 83.0% of the cohort 1961–65 was married at this age.[7]

There is a positive correlation between education and age of marriage, which is much stronger in the young cohort. This correlation is 0.15 for the old cohort, whereas it is 0.37 for the young group. Data show also a rise in the levels of education for each age of marriage. For instance, among women who married between 15 and 19 years old, 12.9% did not finished the primary school in the old cohort. Only 5.3% did not in the young cohort. Among women who married between 25–29 years old, 6.1% obtained a university degree in the old group whereas 19.8% did so in the young group.

If one compares the two cohorts by levels of education, women with the same level of schooling tend to marry later in the young cohort. For instance, among graduate women, 52% of the old cohort marries between 20 and 25 years old, and 28% did between 25 and 30 years old. However, among the young cohort, 25% of graduate females get married in

[6]Individuals who exit are those who move from one state to another (e.g. from single to married). The censored individuals are those who you stop observing before they exit.

[7]Note that for the calculation of this percentage we take a sub-sample of what we call young cohort (1961–77), since only women born before 1965 are observed beyond 30 years.

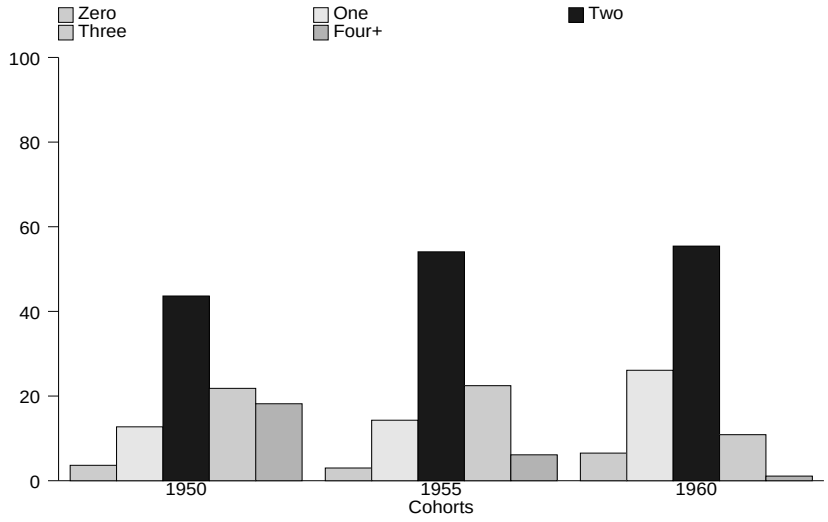
Figure 1: Proportion having 1^{st} Birth Within Two Years of Marriage

the interval 20–25 and 50% do so in the interval 25–30. There are two possible explanations. On one hand, one of the targets of women born before the 60s was to get married (at all education levels) because of the traditional society. On the other hand, nowadays women are more demanding in their career aspirations and they wish to settle into their jobs before getting married. The Spanish labour market in the 80s and 90s did not help because of its huge unemployment rates and unstable contracts. This delays entry to the labour market by graduate women and thus postpones marriage.

In both cohorts, higher education is linked to longer duration between marriage and first child. The main difference between the two cohorts comes in levels of education 2, 3 and 4, respectively secondary school first level, secondary school second level and vocational studies. These education levels have a higher proportion of individuals that take more than two years to give birth from the date of marriage. For example, 7.1% of women with level 4 have a duration from marriage to first child longer than 2 years in the old cohort, whereas 51.9% do so in the young cohort.

In the relationship education *vs* spell to second birth, those with the highest levels of schooling tend to spread the births over more than two years. As expected, high educated females delay first birth longer after marriage, this effect being stronger in *Cohort 1961–77*. Interestingly, the graduate group experiences an increase in the proportion of women having the second birth less than two years after the first one. For example, 93% of graduate mothers took more than two years after the first child to have their second one in *Cohort 1945–60*. The percentage is 61% for *Cohort 1961–77*.
Figure 1 represents the proportion of women who had the first child within two years of marriage by the age at marriage. Younger cohorts seem to have shorter durations when the age of marriage is less than 19 years old. From that age on, the old cohort show a greater proportion of married women having children within two years of their marriage.

Figure 2: Number of Children of Married Women at 35 Years Old



Hazard models allow us to search for the main features that influence the timing of births and compare among cohorts. Note that the picture refers to women who are married. Spanish women still generally marry before having children. In the old cohort, 2.5% of the women had a baby before they got married. In the young cohort, the percentage is 5%. It is also interesting to study the timing to marriage, since fewer women get married and those who do, marry later. This plays an important role in fertility since fecundity has its peak at early ages. The later a couple cohabit together, the later they will have children and the shorter will be the fertile spell.

Female labour force participation influences family formation. In the old cohort, among those women who had at least one child at the time of the interview, 37% were employed when they married. For the sample 1961–1965,[8] 45% of women with at least one child were employed. If we focus on employed women, 98% of those who were employed in high skill profile jobs at the time of the marriage had at least one child by the time of the interview in the old cohort. This percentage is reduced to 82% among women born between 1960 and 1965. Among low skill profile jobs, the percentages of women who had at least one child by the time of the interview are respectively 96% and 92% for the old and young cohort. There is a slight increasing tendency to remain childless. 64% of women in the old sample who were working in high profile jobs at the time of their first birth had a second birth in the old cohort whereas 45% had at least two children in the cohort 1961–1965. The percentages for low skill profile jobs are respectively 81% and 65% for the two cohorts. This shows a reduction of fertility among employed people or, at least, a postponement of family formation since the young cohort for this comparison is aged between 30 and 35 at the interview. Women employed in more skill demanding jobs

[8]In these statistics, we omit relevant information in the computation of number of children such as how old the woman is. For a fair comparison we take only individuals aged 30 or more at the interview for group 1961–1977.

have fewer children.

Despite the fact fertility has dropped, people in the two cohorts do not report significant differences in the ideal number of children for a Spanish family. Table 11 in Appendix B summarises the women's preferences. Many women in the young cohort consider two children as an ideal number but they do not have them. Figure 2 shows the proportion of married women who have any, one, two, three and four or more children at 35 years old for three cohorts (1950, 1955 and 1960). The plot tells us that the percentage of women with any or only one child has increased whereas the percentage for three and four has diminished.

6 Model

As previously mentioned, the tool used to study the timing of marriage and births is the duration model. The two basic concepts are the following: survival and hazard function. The survival function tells the probability of 'surviving' (remaining) in a specific state. The hazard function specifies the probability of exiting (leaving) a particular state.

6.1 Hazard Functions

$$h(t|x) = \lim_{\Delta t \rightarrow} \frac{1}{\Delta t} Pr(t <= T < t + |T >= t, x)^9 \quad (1)$$

The exit or hazard rate of marriage implies the conditional probability density function of leaving a status of being single to being married, given that the individual has been single for a certain time and given her characteristics. The exit or hazard rate of first birth is the probability of exiting the state of being married with no children to the state of having one child, given that the particular couple has been married for a specific period and given her characteristics. One can reproduce this methodology to study the change of state from one child to two, from two to three, and so on. We will avoid pointing out that what is explained about moving from a situation of being married with no children to another one with one child can be generalized to any other shift between two states (e.g. single to married, married with one child to married with two children).

Let $f(t|x)$ be the unconditional (with respect to the time) probability density function of exit from one state to another and $F(t|x)$ the cumulative distribution function for an individual with characteristics x. The definition of the hazard function $h(t|x)$ implies:

$$h(t|x) = f(t|x)/(1 - F(t|x)) \quad (2)$$

The denominator in Equation 2, i.e. the complement of $F(t|x)$, is the survival function $S(t|x)$ representing the probability of 'surviving' in a specific state. Here the survival rate means, for example, the probability at time t that a woman remains single.

[9] x is the vector of explanatory variables (that might be dependent or independent of time). T is a random variable of the exit time.

As mentioned, the exit rate from a state depends upon the time spent in that state and the individual characteristics. Consider, for example, the exit rate from the state of being married with no children to the state of being married with one child. There are a number of factors that might cause the hazard rate to change (in both directions) during the spell of marriage with no child, implying duration dependence. The first is that the longer the couple has been married, the older is the woman and her husband. It is a biological fact that women and men become less fertile as they age. This implies negative duration dependence. That is, the exit rate depends negatively on time. On the other hand, it is possible to find arguments that go in favour of positive time dependence. For instance, some couples may wish to get settled before having children. Furthermore, some couples may require some kind of treatment to facilitate their reproduction. The existence of duration dependence has to be checked empirically. It might be that how long the couple has been married has no impact and it is only the individual characteristics of both members of the couple that determines the change of state. This will be in accordance with an exponential baseline hazard.

In Equation 2, the possibility of duration dependence is expressed by the t-argument in $h(t|x)$. Duration dependence is positive if the hazard rises with duration ($\delta h/\delta t > 0$) and negative if it falls ($\delta h/\delta t < 0$). As already mentioned, the net direction of the effects indicated above is an empirical matter. The exit rate is also a function of the individual characteristics (x), which can be constant or time-varying. The features that are constant are those who do not change along the time of analysis (for example, region or religion). Time-varying covariates are characteristics that vary in time such as the employment status of the individual.

The most common assumption is to make the time profile of the hazard function independent of x. Then, h is formed by two factors: a function of regressor variables, x, given by $\Phi_1(x)$, and a function of time $h_0(t)$:

$$h(t|x) = \Phi_1(x) * h_0(t) \tag{3}$$

This specification is the Proportional hazard models (PH-models) since two different couples have hazards that are in fixed proportions for any t (Cox and Oakes (1984)). So the hazard rate exhibits the same time path for all couples, except for proportional vertical shifts caused by differences in the regressors' values.

The hazard has to be positive. Hence, the factor Φ_1 is taken as an exponential:

$$\Phi_1 = exp(x'\beta) \tag{4}$$

giving

$$h(t|x) = exp(x'\beta) * h_0(t). \tag{5}$$

For the baseline hazard $h_0(t)$, one might adopt parametric or semi-parametric specifications (where it is not constrained to belong to a specific parametric family). Forcing the

hazard baseline function to take a particular shape may be a disadvantage if the parametric function does not fit properly the duration dependence.[10] This is why we use the semi-parametric Cox model, which allows derivation of the coefficients for the explanatory variables, but places no restrictions at all on the shape of the baseline hazard. Then, depending on the form of the baseline, one could compare the results with a parametric specification. Two examples of parametric specifications are the Exponential and the Weibull. The former is a model with $h_0 = 1$. The exponential parameterisation assumes that the hazard is independent of time. One can generalise the Exponential model to the Weibull where

$$h_0(t) = \alpha t^{\alpha-1}, \alpha > 0. \tag{6}$$

The hazard rises or falls monotonically according as $\alpha > 1$ or $\alpha < 1$. The case $\alpha = 1$ comes back to the exponential model.

The appropriate likelihood function for our sample, derived by Lancaster (1979),[11] represents the likelihood of the events in the period during which the exit process is monitored, say L_i. Therefore, we may face complete and incomplete spells. For example, in the case of first birth, complete spells occur when the realised time of being married with no child, T_i, is less than the period of observation L_i. Their contribution to the likelihood function is through the density function evaluated at that point. With incomplete spells, there are two cases: left censored (when the moment the couple entered into the married with no child state is unknown) and right censored (when it is unknown when the couple left this state). Normally people do not consider left censored spells (they are eliminated from the sample). Under the current paper, we do not face the problem of the left-censored spells since we know the dates of marriages and births. Usually, when one talks about incomplete spells it is referred to right censored ones, which contribute to the likelihood by the survival function evaluated at L_i. Individuals are censored at the interview date, when either they or their partners are sterilized, or when they separated, divorced or widowed.

The likelihood can thus be written as:

$$L = \prod_{N_U} f(T_i, x_i) \prod_{N_C} S(L_i, x_i) \tag{7}$$

where N_U stands for the uncensored cases, while N_C for the censored cases. An alternative way to write the likelihood function is

$$L = \prod_{i=1}^{n} f_i(t_i|x_i)^{\delta_i} S_i(t_i|x_i)^{1-\delta_i} \tag{8}$$

where δ_i is the censor indicator (takes value 1 for uncensored observations, and 0 for censored ones).
Equation 8 can be written as a log-likelihood function in terms of the hazard and the

[10] Ridder (1987) shows that a flexible baseline hazard is also favorable if we are concerned about unobserved heterogeneity.

[11] Also Lancaster (1990).

cumulative hazard function:[12]

$$l = \sum_{i=1}^{n} \delta_i lnh(t_i|x_i) - \sum_{i=1}^{n} H(t_i|x_i). \tag{9}$$

The log-likelihood function is then maximised with respect to its parameters.

6.2 Kaplan-Meier Survival Estimation

The product limit estimator or the Kaplan-Meier estimator is based only on the data of the sample and is non-parametric. This estimator is computed as follows

$$\widehat{S}(t) = \prod_{j|t_j<=t}^{j} (\frac{n_j - d_j}{n_j}) \tag{10}$$

where n_j is the risk set at time j, d_j is the number of failures at time j, and the product is over all distinct failures times less than or equal to time j. The risk set at time $j(n_j)$ is the number of spells neither completed nor censored before time j.

Kaplan-Meier Survival estimates give the probability of remaining in the same state (e.g. not to have an additional child) at a particular moment of time. Despite the fact these estimates omit characteristics, they are a useful first step to analyse the differences between two groups. For example, Figure 3 represents the Kaplan-Meier Survival[13] in the Single state estimates for the two cohorts. The young cohort shows a higher survival rate in the single state for all t, which reinforces our strategy of splitting the analysis between the two cohorts. This enables us to seek changes in the social and economic determinants of family formation across these two age groups. The same exercise is repeated for surviving in the Married Childless state (Figure 4), where time zero corresponds to the date of each woman's marriage. Figure 5 and Figure 6 show the Kaplan-Meier Survival estimation in the state of Married with one and two children, respectively. These pictures provide evidence that the young cohort has a greater probability to survive in each state at all durations (note that these graphs do not incorporate the effect of the covariates). This is particularly true for the survival rate in the 'Single State' and the 'Married With Two Children State'. Therefore, we observe that the two cohorts behave differently, especially in their decision when to marry and the timing to the third child.

As mentioned in Section 4, the survey was carried out in 1995 and historical information was collected retrospectively. This implies that older women in 1995[14] are in general observed over a longer time, which means that the number of censored individuals with respect to the total is expected to be larger in the young cohort. We would like to measure if differences in observed periods could lead to erroneous statements. In order to try to account for this effect, we have replicated the old cohort's Kaplan-Meier estimations by 'artificially' truncating data as the young cohort, building the histories for them only up

[12]The cumulative hazard function is defined as $H(t|x) = \int_0^t h(s|x)ds$.

[13]The analysis time is measured in months, being zero at the individual's 15^{th} birthday.

[14]Sample aged 18–49.

Figure 3: Survival in the Single State. Cohort Comparison

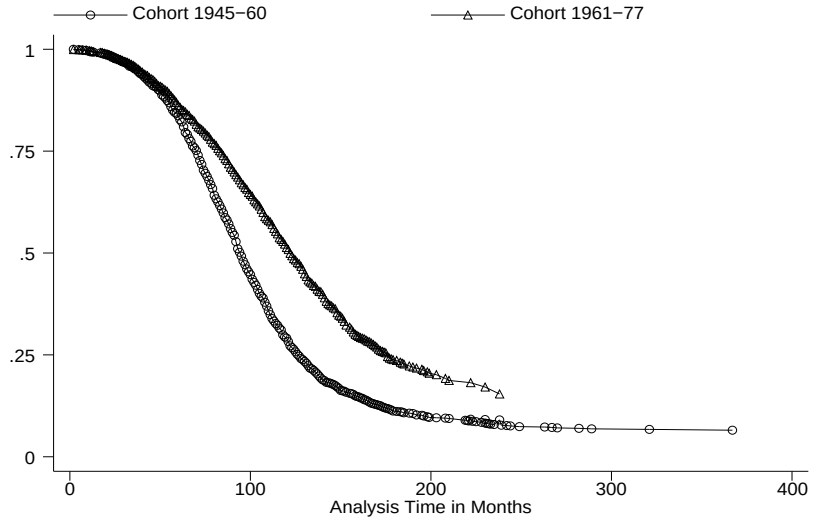
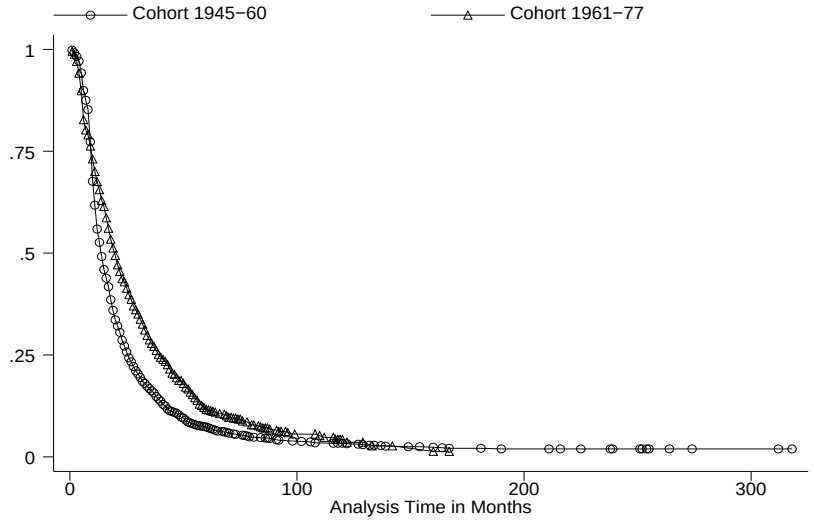


Figure 4: Survival in the Married Without Children State. Cohort Comparison



to 1980 (even if women were questioned in 1995). Thus, the individuals who are observed further in both cohorts are aged 35. This 'artificial' exercise shows that these two groups still fall apart. Kaplan-Meier Survival curves for the old and young cohort are even more spread out, especially towards the third child. These graphs are in Appendix **C**.1 (Figures 8, 9, 10 and 11).

7 Estimation

The decision to get married is taken some time before the big day. This is why most time varying variables are taken six months before the current time in the estimation for the hazard of marriage. These are: *Schm6*, *Emplo6*, *Unemrf6* and *Tempf6*. Female education

Figure 5: Survival in the Married With One Child State. Cohort Comparison

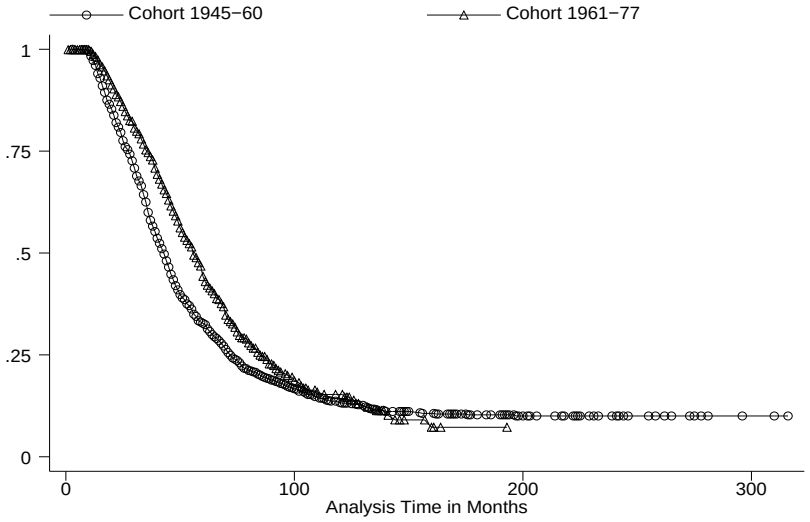
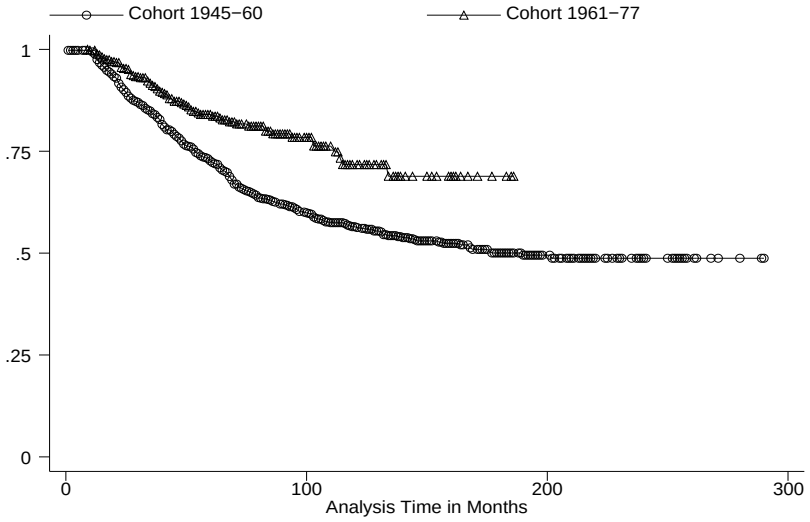


Figure 6: Survival in the Married With Two Children State. Cohort Comparison



is also a time-varying variable. Nevertheless, its value in the estimation is not lagged since it can be accurately predicted at the time of decision. The decision to give birth is also taken some months before the child is born. Thus, there are also lag variables for the estimation of the birth timing: *Schm12*, *Emplo12*, *Unemrf12* and *Tempf12*.[15] By taking the lags of labour market covariates we also reduce the concern of fertility and employment being simultaneously decided.[16]

One could be concerned about the fact that the decision of marriage and first birth

[15]We have also tried with a lag of nine months but the results were basically the same.

[16]Later in the paper we discuss how we tackle the problem of endogeneity between fertility and female labour supply.

are endogenous. Some research has been done in order to measure the importance of this effect. For example, Baizán et al. (2001) use a simultaneous hazard equations approach in order to overcome potential bias caused by the correlation between the process of first birth and union formation. In order to validate how the mutual dependence of the decision could have an effect on our results, we have undertaken the estimation by taking time zero 7 months after the marriage. In this case, we select those women whose marriage was definitely not simultaneous to the birth. We find that our estimates are not significantly different from the estimation where the counter is taken at the marriage date. Thus, we claim that we do not have to be preoccupied that our results are misleading because of this potential endogeneity. We believe that this is supported by Baizán et al. (2001). They find minor changes in their economic explanatory variables once they control for an unobserved correlation process component. For instance, in their specifications (with and without allowing for mutual dependence), employment reduces the hazard of first birth and marriage, being the absolute value greater under the simultaneous model. Despite the fact that they show that correlation matters, the interpretation on their economic covariates is not inverted.

Another drawback is the endogeneity between fertility and female labour supply. For example, we could argue that more family oriented women abandon their working life before the birth itself, so that the causal relation is, in fact, reversed. For instance, Angrist and Evans (1998) show that female employment and childbearing are endogenous. Notice that lagging our time-varying covariates partly overcomes it.[17] In addition, we create a variable that accounts for the taste for work. That is, if we assume that the employment variable is endogenous because 'taste for work' is omitted and 'taste for work' has a positive impact on employment and a negative impact, ceteris paribus, on fertility, we need to control for 'taste for work'. Thus, we include a covariate taste for work in our regression. This variable (*WorkTaste*)[18] captures the the relevant preference and leaves our time-varying *Emplo12* free from spurious meaning. If *Emplo12* turns out to be negative and significant, this implies that being at work reduces the likelihood of having a further child at that time, no matter what is your career taste.

The estimation of the parameters for the family timing for the female sample has been done under two different perspectives, which we call *Reduced* and *Structural form*. In the male sample we only use the former. We believe that one of the main variables that determine each demographic decision (overall in the young cohort) is the expectation of being employed at each time ($P\widehat{Emplo}$). That is, if a woman decides to have a child, she is concerned about the probability she will remain employed at the period of the birth. Among several features, her expectation ($P\widehat{Emplo}$) depends primarily on her education and lagged employment characteristics. ($P\widehat{Emplo}$) is informative since it gives women's perception of her chances of being employed at each time. That is, if she expects to be employed or not given her characteristics. This is an important element for her decision. Not only the fact of being employed or not one year before the birth matters, but also

[17] Women who decide to have a child might drop employment before the birth if they are home-oriented. This is why it is important to lag the employment status variable at 12 months. We also estimate the hazard with a lag of 18 and 24 months to ensure that we avoid capturing the inverse causality in our results.

[18] It takes value one if the person was at work one year after she completed education.

the chances to be employed after.

($\widehat{PEmplo}$) is a time-varying variable, which results from a probit estimation of the probability to be employed given individual and labour market characteristics at each time. The dependent variable takes value one if the person is employed at that period. Otherwise, it takes value 0. The covariates for the estimation of ($\widehat{PEmplo}$) in the analysis of the timing to get married are the following:[19] regions (*NW*, *NE*, *CMadrid*, *C*, *E*, *Canaries*), *Siblings*, *DivPar*, education level (*E2*, *E3Voc* and *E3GrPo*, with omitted *E1*), *Religious*, *WorkTaste*, cohorts, *Schm6*, *Emplo6*, *Unemrf6* and *Tempf6*. Lag variables of 12 months instead of 6 months are used in the analysis of timing to give birth. There are also other demographic variables such as the age of marriage (*AgeMa*) as well as the partner's education.

The parameters of this probit estimation permit calculation of the individual probability of being employed each time: $\widehat{PEmplo} = f(\hat{\beta}x)$.

For explanatory purposes, we rewrite the previous equation as:

$$\widehat{PEmplo} = f(\hat{\beta}x + \hat{\beta}_e Emplo6 + \hat{\beta}_u Unemrf6) \tag{11}$$

where x is the vector of all explanatory variables except *Emplo6* and *Unemrf6*. This result is used as a variable in the estimation of the structural form.

7.1 Structural Form

The estimation of the exit rate in structural form incorporates $\widehat{PEmplo}$ as explanatory variable, together with many other covariates (x).

$$h_s(t|x, \widehat{PEmplo}) = h_0(t)exp(\alpha x + \gamma \widehat{PEmplo}) \tag{12}$$

The estimation of $\widehat{PEmplo}$ and h_s share all variables except two (*Emplo6* and *Unemrf6*) that we use to identify the equation. By doing this, we consider that both of these covariates affect the hazard only indirectly through its effect on the chances of being employed at each time ($\widehat{PEmplo}$). This is of interest since it allows us to distinguish between the direct and indirect effect (through their influence on $\widehat{PEmplo}$) of the different variables. The *Reduced form* will only give the net effect of the two.

7.2 Reduced Form

Rather than introducing directly the variable $\widehat{PEmplo}$ into the estimation, the reduced form estimates a model that uses as explanatory variables those elements who determine $\widehat{PEmplo}$.

$$h_r(t|x, Emplo6, Unemrf6) = h_0(t)exp(\delta x + \delta_e Emplo6 + \delta_u Unemrf6) \tag{13}$$

Thus, the parameters of these variables provide joint net information about their direct and indirect impact on the hazard. For example, we may have that higher education is

[19] The description of each variable is done in Section 4 and in Appendix A.

related to higher exit in the estimation of the structural form ($\hat{\alpha}_e > 0$) but the opposite in the reduced form ($\hat{\delta}_e < 0$). This means that higher level of education is negative in the reduced form estimation through its impact on the expectation of being employed, with $\hat{\gamma}_e < 0$. Once we control for it, higher education actually increases the chances of giving birth. Note that $\hat{\delta}_e \approx \hat{\alpha}_e + \hat{\gamma}_e \hat{\beta}_e$. In this example, the negative indirect effect of education on the exit rate offsets the direct and positive one, giving a negative sign in the reduced form estimation.
Thus, the model is estimated under the reduced and structural form for the two cohorts.

8 Main Results

The explanatory variables are the same in the estimation of both old and young cohort, except for *Tempf6*, which tells the percentage of female employees with a temporary contract at national level for each period. This covariate is only present in the estimation for the young cohort. The reason is that these contracts only exist from 1984 onwards. Therefore, the majority of people in the old cohort have a zero value, making this variable meaningfulness. Once the variable is removed, the sign and significance of the rest of the variables is not modified, their coefficients slightly change and the comparison between the two groups is fair.

In none of the estimations do common variables between reduced and structural form change sign, so both direct and net effect discussed in Section 7 go in the same direction.

Tables 3, 4, 5 and 6 report both the coefficient and the hazard ratio for the *Reduced model*. Analogous tables for the *Structural form* are in Tables 12, 13, 14 and 15 in Appendix B. Exponentiated individual coefficients have the interpretation of the ratio of the hazards for a one-unit change in the corresponding covariate. For example, if the coefficient on variable 1-if-religious is 1.26, then religious women face a hazard 26% greater than non-religious and the hazard ratio=exp(coefficient of estimation) is 1.26.

In Section 6.2 we discussed the concern about the fact that the length of the history is longer in the old cohort, which causes the number of censored observations to be proportionally greater in the young cohort. Although the estimation takes this issue into account, one would like to check if the disparity in period of observation leads to different conclusions. This is why we have redone the estimations for the old cohort following these individuals only up to 1980 (which makes the path equivalent to the young cohort). Results from the estimation for the old cohort show that the coefficients are not significantly different from each other when applying the 'normal'[20] and the 'artificial' specification in the timing to marriage, first and second child. However, some of the estimates are significantly different in the estimation of the timing to the third child.[21] Fortunately, as we will explain later, results in the 'artificial' estimation do not contradict our statements. When different from the 'normal' estimation (only in the timing towards the third child),

[20] We call 'normal' specification the one that uses all available information (up to 1995). The 'artificial' specification is the one that makes the fiction of observing the old cohort only up to 1980.

[21] This is expected since it is in this state where the two observed periods fall more apart.

conclusions drawn from the 'normal' estimation are reinforced rather than reversed.

8.1 Female Sample Analysis

8.1.1 Timing to Marriage

Table 3: Timing to Marriage

Variables		*Cohort 1945–60*		*Cohort 1961–77*	
		Coefficient	*Haz. Ratio*	*Coefficient*	*Haz. Ratio*
	NW	-0.162 (0.127)	0.850	-0.039 (0.136)	0.962
Regions	*NE*	-0.065 (0.118)	0.937	-0.342** (0.129)	0.710
Omitted	*CMadrid*	-0.037* (0.116)	0.963	-0.225 (0.134)	0.799
Category	*C*	-0.024 (0.111)	0.977	0.079 (0.109)	1.082
is S	*E*	0.016 (0.099)	1.016	-0.113 (0.101)	0.893
	Canaries	0.244 (0.175)	1.276	0.080 (0.163)	1.083
Siblings		0.009 (0.013)	1.009	0.016 (0.015)	1.016
DivPar *Yes=1*		-0.101 (0.202)	0.904	0.124 (0.143)	1.132
Religious *Yes=1*		0.232** (0.101)	1.261	0.281** (0.087)	1.324
WorkTaste *Yes=1*		0.083 (0.073)	1.087	-0.281** (0.071)	0.755
Female	*E2*	-0.067 (0.069)	0.935	-0.262** (0.079)	0.769
Education	*E3Voc*	-0.218* (0.134)	0.804	-0.380** (0.138)	0.684
Omitted E1	*E3GrPo*	-0.028** (0.177)	0.975	-0.462** (0.144)	0.630
Schm6 *Yes=1*		-0.733** (0.148)	0.480	-1.355** (0.113)	0.258
Emplo6 *Yes=1*		-0.190** (0.073)	0.827	0.240** (0.071)	1.271
Unemrf6		-0.031** (0.008)	0.969	-0.012** (0.006)	0.989
Tempf6				-0.009* (0.005)	0.991
Cohorts	*1950–54*	0.037 (0.088)	1.037		
Omitted 1945–49 and	*1955–60*	0.451** (0.109)	1.570		
1961–65 for Old and	*1966–70*			-0.038 (0.105)	0.962
Young respectively	*1971–77*			-0.220 (0.187)	0.803
Log likelihood		-6657.6		-7148.8	
N subjects		1150		2228	
N observations		133006		214516	

*Significant at 10% level.

**Significant at 5% level.

[1]Standard errors in brackets.

Table 3 shows the results from the hazard of marriage. Our regional dummies suggest that a female from *S* (South: Andalucía and Murcia)[22] is slightly more likely to get married in the next month compared to other areas, except for *Canaries*. However, this negative

[22]The definition of the regional categorical variables is done in Section 4.

effect is only significant for *NE* in *Cohort 1945–60*. These differences in regions are in line with the fact that the South of Spain is the most traditional area of the country, with prevalence for marriage.

Individual social background is captured by the following variables: *Siblings*, *DivPar* and *Religious*. Neither the number of siblings nor the fact of having divorced parents are significant determinants of the hazard rate. However, a religious woman has a hazard rate 26% greater than a non-religious at any time in the old cohort and 32% greater in the young cohort.

Education level has a different behaviour in both cohorts. In *Cohort 1945–60*, higher levels of education influence the hazard negatively, but the coefficients are only significant at 10% for *E3Voc*. On the other hand, higher education is strongly significant at all levels in *Cohort 1961–77*. For instance, at each time and controlling for the other variables, a woman with a graduate or post-graduate degree has an exit rate which is 37% lower than that of somebody who only achieved primary school. Thus, education has much greater negative impact on the exit rate in the young cohort.

Another variable that has a strong and significant negative impact on the exit rate to marriage is the dummy that reports at each time if the individual was or not at school six months before (*Schm6*) the period under consideration. In *Cohort 1945–60*, a woman who was enrolled in education six months before, has an exit rate around 48% that of a woman who was not. In *Cohort 1961–77*, this negative effect is even greater with a hazard ratio of 0.26. This is not surprising since students are unable to live independently due to the lack of own resources.

Taste for work is not significant in *Cohort 1945–60* but it impacts negatively in *Cohort 1961–77*. The covariate that specifies at each time if the individual was employed or not six months before (*Emplo6*) has a totally different effect on the hazard in the two cohorts. In *Cohort 1945–60*, this variable has a negative and significant effect on the exit rate, with a hazard rate equal to 0.83. By contrast, this variable has a positive and significant effect on the hazard in *Cohort 1961–77*, with a hazard rate equal to 1.27. That is, old-cohort employed women (lagged six months) have less chances of marrying in the next month at all times. In the young cohort, to be employed increases substantially the chances of getting married. Baizán et al. (2001) find that being employed reduces the intensity of marriage in their sample. However, they do not distinguish between the two cohorts and apparently the effect of the old cohort seem to prevail if the whole group is merged. The advantage of our study is that it allows us to analyse whether some variables have a different impact in family formation in these two well-defined groups. Theory predicts opposite effects of women in employment on marriage. On the one hand, one might expect a positive coefficient since female employment actually increases economic resources that are needed to form a family. On the other hand, it might have a negative effect, especially in more traditional societies, if employment means female independence. Our results show evidence that the former (positive) prediction might be valid for *Cohort 1961–77* whereas the latter (negative) prediction might be applied to *Cohort 1945–60*. This could imply a change of mentality in the Spanish society. In the old times, the main target of a woman

was to get married and they abandoned their job prospect in order to do it (employment was a signal of self-reliance and was conceived as a 'bad' characteristic for marriage). Nowadays, women study further and they want to develop a job career. Thus, they do not marry before they are settled in the labour market. Simultaneously, there has also been a generalised increase in the demand for a high standard of living and an increase in housing costs, which makes the salary of the woman necessary as a source of income in the household. This agrees with the view that female employment is required to leave the parental home since it increases resources available and, consequently affects positively the hazard of marriage. We would also like to point out that the dummy *Emplo6* might be capturing different effects in the two age groups. The old cohort is characterised by lower unemployment rates around union formation compared to their young cohort counterparts.[23] This means that non-employment (i.e. *Emplo6*=0) in *Cohort 1945–60* is more likely to refer to inactivity, whereas non-employment in *Cohort 1961–77* entails both unemployment and inactivity. The latter might contribute in explaining the opposite sign since in the young cohort there might be not only a choice option but also an economic issue.

The *Structural form* estimation informs about how the six-month in advance forecast of being employed affects the hazard. This variable is estimated to influence negatively in the old cohort and positively in the young one. This means that the higher the expectancies of working in six months time, the smaller is the probability of marrying next month in the old cohort and, the greater is this probability in the young one.

Regional female unemployment rates (*Unemrf6*) describe the labour market risks and opportunities. We would expect this variable to reduce the likelihood of marriage. The coefficient for this estimate is negative and significant for both cohorts. For example, an increase of one percentage point in the female unemployment rate reduces the hazard rate by 1.1% in *Cohort 1961–77*. This shows evidence that the more unstable the labour market, the lower the chances a woman will marry in the next month. Another potential reason why the Spanish marry so late is the lack of job security. The latter aspect is enforced with the variable that reveals the percentage of female employees that work on temporary contracts (*Tempf6*). This covariate is negative and significant. That is, the greater the proportion of women working on temporary contracts, the smaller is the probability of marriage.

We also control for five-year cohort bands. In our old cohort estimation, women born between 1955–1960 are more likely to exit into marriage. In our young cohort, latter generations reduce the intensity of the hazard, although the coefficients are not significant.

Table 4: Timing to 1^{st} Child

Variables		*Cohort 1945–60*		*Cohort 1961–77*	
		Coefficient	*Haz. Ratio*	*Coefficient*	*Haz. Ratio*
	NW	-0.043 (0.132)	0.958	-0.437** (0.159)	0.646
Regions	*NE*	-0.017 (0.124)	0.983	-0.335** (0.156)	0.715
Omitted	*CMadrid*	0.028 (0.121)	1.028	-0.478** (0.157)	0.620
Category	*C*	0.201* (0.114)	1.222	-0.135 (0.125)	0.874
is S	*E*	-0.118 (0.105)	0.889	-0.402** (0.118)	0.669
	Canaries	0.092 (0.183)	1.096	-0.044 (0.181)	0.957
Siblings		0.034** (0.014)	1.035	-0.001 (0.017)	0.999
DivPar Yes=1		-0.138 (0.212)	0.871	-0.005 (0.108)	0.995
Religious Yes=1		0.006 (0.106)	1.006	0.274** (0.105)	0.315
AgeMa		-0.009 (0.014)	0.991	-0.062 (0.022)	0.940
WorkTaste Yes=1		-0.007 (0.070)	0.993	-0.276** (0.092)	0.759
Female	*E2*	-0.033 (0.070)	0.967	-0.105 (0.099)	0.900
Education	*E3Voc*	0.206 (0.152)	1.288	-0.416** (0.184)	0.659
Omitted E1	*E3GrPo*	-0.207 (0.151)	0.813	-0.429** (0.203)	0.651
Partner	*E2P*	-0.071 (0.141)	0.932	-0.045 (0.229)	0.956
Education	*E3VocP*	-0.006 (0.199)	0.994	0.079 (0.334)	1.082
Omitted E1P	*E3GrPoP*	-0.313* (0.182)	0.731	0.049 (0.257)	1.050
Schm12 Yes=1		-0.136 (0.177)	0.873	-0.028 (0.145)	0.972
Emplo12 Yes=1		-0.187** (0.070)	0.829	-0.158** (0.076)	0.854
Unemrf12		-0.008 (0.007)	0.992	-0.012* (0.007)	0.988
Tempf12				0.001 (0.005)	1.001
Cohorts	*1950–54*	-0.027 (0.092)	0.973		
Omitted 1945–49 and	*1955–60*	0.034 (0.117)	1.034		
Cohort 1961–65 for Old and	*1966–70*			-0.211 (0.115)	0.810
Young respectively	*1971–77*			0.158 (0.245)	1.172
Log likelihood		-6103.6		-4958.4	
N subjects		1041		1024	
N observations		26176		25452	

*Significant at 10% level.

**Significant at 5% level.

[1]Standard errors in brackets.

8.1.2 Timing to First Child

Table 4 shows that region does not have a significant effect on the probability of having a first child in the next month in *Cohort 1945–60*. However, it has an impact on *Cohort*

[23]The proportion of women employed, unemployed and inactive has changed substantially since 1970. For example, 22% married women aged 20–30 were employed in 1977, 1% were unemployed and 77% were inactive. In 1987, the rates were 30%, 13% and 57%, respectively. In 1997, the proportions were 40%, 20% and 40%.

1961–77, where all regions have a lower probability of exiting relative to the *S. NW*, *NE*, *CMadrid* and *E* have a significant coefficient. This is again probably due to the fact that the South has remained more traditional and people might be using less effective contraceptive methods. Data from the sample seem to corroborate this hypothesis. For example, without differentiating among regions, 71% of women took contraceptive precautions in their first complete intercourse in the young cohort. However, 63% did so in the South. By contrast, 75% took precautions in the East and 82% in the North East. The equivalent percentages were much lower in the old cohort with an overall of 35% using contraceptive methods in the first intercourse. In the South, the percentage was 26% and in the East and North East was 47% and 32% respectively.

The number of siblings increases significantly the hazard of first child in *Cohort 1945–60*. Parents separation has no impact in either of the two cohorts.[24] Finally, *Religious* is positive in both cohorts although it is only significant in the young cohort. In the latter group, a woman who defines herself as religious has a hazard rate 32% greater than a woman who does not. Nowadays, being religious seems to create more disparity among people. That is, those who define themselves as religious do indeed subscribe to a particular ideology. In the old cohort, people (religious or not) were more generally influenced by the traditional society and the fact of calling themselves religious did not imply that they were more likely to follow traditional patterns of behaviour than the remainder.

Demography foresees that age of marriage is negative related to the timing of the first child. Our results partly corroborate this expectation since we obtain negative (although insignificant) signs. In the old cohort, an extra year on the age of marriage has a hazard ratio of 0.99. That is, each year delaying the marriage reduces the exit rate by 1% (ceteris paribus). In the young cohort, the ratio is 0.94.

Female education is strongly linked to fertility trajectory. Some authors find that higher values of education tend to delay the onset of childbearing and then compress the span of births into fewer years (Hoem and Hoem (1989)). If a woman has achieved a graduate or postgraduate degree, she owns a high value in the labour market. This increases her opportunity cost of building a family since having a child implies taking some time off. The awareness of this opportunity cost is augmented if the labour market is neither promising (i.e. high unemployment rates) nor flexible, which enlarges women's professional career risk aversion of motherhood. Once a woman has a first child, theory suggests that a high-educated woman will have a shorter spell towards the second child. The reason is that they compress the births when it is optimal for their professional life. This theory is only confirmed in our young cohort. While a higher education level is not significant in *Cohort 1945–60*, it has a negative and significant impact on the probability to have a first child next month in *Cohort 1961–77*. For example, a woman with an undergraduate or postgraduate degree has a hazard rate that is 65% of that of a woman with a primary degree. This shows evidence that the opportunity cost increases with the level of education, particularly when females are more attached to the labour force (i.e. *Cohort 1961–77*). Educational enrolment lagged twelve months is not significant since most women get

[24] Notice that the number of disruptions in Spain in the period covered is still rather low (2% in the old cohort and 4% in the young one).

married once they have abandoned education.

Being employed twelve months previously reduces the hazard of first child[25] in both cohorts, ceteris paribus. The hazard ratio is 0.83 and 0.85 for the old and young cohort respectively. There are theoretical opinions that predict the impact of employment on fertility in both directions. On the one hand, female employment raises resources and should increase the likelihood of first child. On the other hand, employed women find it hard to combine work and family and they postpone childbearing. The latter is especially true if policies that facilitate reconciliation between family and work are missing and if there is both instability and inflexibility in the labour market. Our results suggest that female employment is a brake on family formation in Spain. This has political implications for the Spanish government who could implement broader family-friendly policies. In Section 7 we discussed the general concern about the endogeneity of fertility and labour supply. In order to overcome it, we lag[26] the employment covariate and we control for the individuals' work preferences with the variable *WorkTaste*.[27] Those women with higher preference for work are less likely to have a first child in the next month, being strongly significant in the young cohort. We believe that this variable reduces the possibility that the impact of employment status *Emplo12* is misleading.

Intuition indicates that women who work part-time are more family oriented. This is why the model was also estimated taking into account job status: i.e. part-time *vs* full-time. The effect on the probability of having a child in the next month was found to be similar under the two categories.[28] Thus, there is evidence that a part-time job does not contribute to making family and work more compatible. Recent work by De la Rica, Ariza and Ugidos (2002) using the European Community Household Panel (ECHP) find that part-time (compared to full-time) does not increase intensities of Spanish first birth. This is due to the fact that part-time jobs are not common in Spain and in any case they are typically not based on a voluntary decision. The percentages of part-time jobs vary a lot in Europe. Greece, Portugal, Italy, Ireland and Spain are those EU countries where this typology is less frequently used. By contrast, in the North and Centre of Europe they are much more prevalent. In the latter group, the government's intervention to reconcile family and work, rather than the production structure, has favoured the development of part-time jobs (Consejo Económico y Social (1996)). Moreover, among those countries where part-time jobs are most frequent (e.g. Great Britain and the Netherlands), most people who work part-time prefer this to full-time work (e.g. Nickell and Van Ours

[25]This result is consistent with other empirical studies (for example, Kalwij (2000) for the Netherlands, Hoem and Hoem (1989) for Sweden and Harvey (1996) for the US). They find that fertility is negative related to labour force participation.

[26]We also lag employment 18 and 24 months to exclude the possibility of home-oriented women leaving employment far before the birth, which will reverse the causality. We find that our employment covariate lagged 18 is negative and significant in both cohorts. The employment covariate lagged 24 reduces the hazard to first child but it is not significant. We believe that there is evidence for employment causing postponement of fertility since employment status far ahead from the birth date affects negatively the hazard.

[27]The preference for work is a dummy value that equals 1 if the individual is working one year after completing school.

[28]Since we found no significant difference between part and full-time we decided to merge them into one single category (employed).

(2000)). We would expect to find that these two job statuses influence differently the chances of childbearing in countries with more flexibility in working hours. De la Rica et al. (2002) compares the effect of working status on first birth in Great Britain, the Netherlands, Ireland and Spain. They find evidence that Spain is the country with the most part-time negative effect on fertility.

Theory by Becker (1960) predicts that the husbands' income should impact positively on fertility. Ariza and Ugidos (2002) estimate the timing of first birth in Spain with 'Encuesta Continua de Presupuestos Familiares' (Spanish Household Survey Panel Data). They find that partner's income affects positively the hazard. Income information is missing in our data and we use husbands' education as a proxy since one expects that higher education is linked to higher wage. Results from the estimation show that this variable is not significant for first birth.

Female regional unemployment rates have a negative effect on the timing to the first birth, with significance in the young cohort. An increase of one percentage point in female unemployment in a particular region in *Cohort 1961–77* reduces the hazard rate by 1.2%. Therefore, precarious labour market atmosphere is translated into fertility postponement. However, even though the proportion of female temporary contracts had a strong influence in the timing to marriage, it does not have an impact on first birth.

The *Structural model* shows that the forecast of being employed in twelve months time generates a negative and significant sign in both cohorts. This suggests that combining family and work does not seem a complementary task for Spanish mothers.

8.1.3 Timing To Second Child

In Table 5 we observe generalised evidence that women who live out of the South have a smaller hazard rate of having a second child. Both the number of siblings and parents divorced are not significant. Neither is religion.

Demographic explanations are captured by the age at first child and the spell from marriage to first child. There is the generalised view among demographic papers that variables such as the timing of marriage and the lengths of prior births spells impact strongly on the spacing of subsequent births. However, Heckman et al. (1985) show that these demographic explanations are not valid in the timing to a second child once they control for unobserved heterogeneity in a parametric specification of the hazard. We find similar results to theirs. In the young cohort, there is evidence that neither of the two is significant. In the old cohort, only the duration between marriage and first child is. An extra year implies a reduction of the hazard rate by 16%.

A high level of female education has been related to faster timing to the second child (e.g. Hoem and Hoem (1989)) because those women try to compress the time spent out of the labour market.[29] This prediction is fulfilled in *Cohort 1945–60*, where the coefficients are positive although only significant among women with a vocational degree. The pattern is

[29] Other authors find that education affects negatively the hazard rate in all births.

Table 5: Timing to 2^{nd} Child

Variables		*Cohort 1945–60*		*Cohort 1961–77*	
		Coefficient	*Haz. Ratio*	*Coefficient*	*Haz. Ratio*
	NW	-0.465** (0.152)	0.628	-0.560** (0.244)	0.571
Regions	*NE*	-0.469** (0.138)	0.626	-0.089 (0.219)	0.914
Omitted	*CMadrid*	-0.180** (0.132)	0.835	-0.571 (0.238)	0.565
Category	*C*	-0.192 (0.125)	0.825	-0.388** (0.167)	0.678
is S	*E*	-0.283** (0.115)	0.754	-0.376** (0.171)	0.687
	Canaries	-0.149 (0.194)	0.862	-0.400 (0.260)	0.670
Siblings		0.020 (0.014)	1.020	0.031 (0.023)	1.031
DivPar Yes=1		-0.034 (0.233)	0.967	-0.013 (0.141)	0.987
Religious Yes=1		0.105 (0.125)	1.111	0.083 (0.153)	1.087
AgeAt1C		-0.014 (0.011)	0.986	0.017 (0.031)	1.017
MenT1C		-0.176** (0.031)	0.839	-0.051 (0.046)	0.950
Girl Yes=1		-0.003 (0.073)	0.997	-0.133 (0.099)	0.875
WorkTaste Yes=1		0.013 (0.073)	1.013	-0.080 (0.104)	0.923
Female	*E2*	0.119 (0.081)	1.126	-0.296** (0.124)	0.744
Education	*E3Voc*	0.385** (0.168)	1.469	-0.056 (0.254)	0.945
Omitted E1	*E3GrPo*	0.074 (0.207)	1.077	0.509* (0.271)	1.663
Partner	*E2P*	0.051 (0.147)	1.053	-0.050 (0.284)	0.951
Education	*E3VocP*	0.006 (0.222)	1.006	-0.046 (0.395)	0.955
Omitted E1	*E3GrPoP*	0.117 (0.199)	1.124	0.110 (0.328)	1.116
Schm12 Yes=1		-0.261 (0.275)	0.770	-0.434 (0.370)	0.648
Emplo12 Yes=1		-0.321** (0.083)	0.726	-0.208* (0.107)	0.812
Unemrf12		-0.007 (0.007)	0.993	-0.019* (0.010)	0.989
Tempf12				-0.008 (0.007)	0.992
Cohorts	*1950–54*	-0.065 (0.107)	0.937		
Omitted 1945–49 and	*1955–60*	-0.165 (0.143)	0.848		
1961–65 for Old and	*1966–70*			-0.059 (0.173)	0.942
Young respectively	*1971–77*			-0.216 (0.349)	0.806
Log likelihood		-5220.4		2519.0	
N subjects		1007		821	
N observations		58893		36986	

*Significant at 10% level.

**Significant at 5% level.

[1]Standard errors in brackets.

different in *Cohort 1961–77*. Those women who finished with a secondary degree have a negative and significant coefficient, and their exit rate is 26% smaller than the exit rate of a woman who only got the primary degree. Women with a vocational degree have a non-significant negative coefficient. By contrast, those women who obtained a graduate or post-graduate degree have greater chances to have a second child in the following month,

compared to somebody with a primary degree. The coefficient is positive and significant with a hazard ratio of 1.66. Thus the theory is confirmed for those women who have a university degree. They will compress the spell between the first two births. This does not imply that women with a graduate or post-graduate degree have more children than those with only primary school. The result means that women with a university degree that had a first child are more likely to have a second child faster. These are a special sub-group among graduate women whose jobs and personality allowed themselves to have a first child and then, they are likely to have a second child. As the human capital theory predicts, they try to have the second child quicker in order to compress the time spent off their jobs.

To be employed twelve months before reduces the likelihood of having a second child in the next month in both cohorts. The hazard ratios are 0.73 and 0.81 for the old and young cohort respectively. Similarly to the timing of first birth, there were no significant differences between part and full-time. Thus, employment is a constraint to expand the family, even after controlling for taste for work. The same reasons applied to first birth (i.e. labour market flexibility, regulations and child-care provisions) can be applied to second birth.

Labour market situation is measured by regional female unemployment rates and the proportion of female fixed-term contracts. In the two cohorts, the higher the unemployment is, the less chances to have a second child in the following month. This is particularly the case in *Cohort 1961–77* where the hazard ratio is 0.989, which means that an increase of one percentage point in regional female unemployment rates reduces the hazard by 1.1%. The impact of fixed-term contracts on second birth, although negative, is non-significant.

Despite the fact that high levels of the husband's education (proxy for income) are foreseen to reduce the time to a second child, our results do not support this theory. Coefficients appear to be insignificant.

The information given by the *Structural form* is that the expectation of being employed is negatively related to the hazard rate, which suggests lack of compatibility between fertility and female participation.

8.1.4 Timing to Third Child

Table 6 shows that in general those living in the South have a greater probability of having a third child in the next months. The number of siblings increases the hazard rate significantly in *Cohort 1945–60*. Neither divorced parents nor religion are significant.

Previous literature (e.g. Harvey (1996)) found that demographic variables have a major role in the timing to the third child as long as employment and education are less important. Our results are in line with theirs since both coefficients of the age at second child and the spell from the first child to the second child are negative and significant. For instance, the hazard ratios for the birth interval are 0.81 and 0.79 for the old and young cohort respectively. That is, an extra year in the spell first to second child reduces

the hazard by 19% in *Cohort 1945–60*.

We find that there exists a significant preference for boys in *Cohort 1945–60*. Couples with two girls have a probability to have a third child 38% greater than couples with one or two boys. The dummy for boys is not significant in any of the cohorts. This corroborates a predilection for boys and not for variety of sexes in the old group. It seems that in *Cohort 1961–77*, the sex of the children is minor in the decision to have a third child.

High levels of education, especially at graduate and post-graduate level, strongly decrease the exit rate for both cohorts. This shows evidence that graduate parity two women choose the two-child norm. That is, those graduates who have children prefer indeed to discontinue childbearing after the second birth.

Lagged employment status is negative but not significant. This means that at parity two other factors (i.e. education, region and demographic covariates) rather than employment are more crucial in determining the probability of a third pregnancy. The precarious labour market plays a minor role on the exit rates. (female unemployment rates impact negatively but are insignificant). Therefore, labour markets and employment mainly affect fertility at earlier parities.

Once more we do not find evidence that partner's education increases the hazard rate, which is contra-intuitive. This could be due to the fact that partner's education is actually not capturing the income effect. Notice also (as explained in Section 4) that this variable is taken at the interview's date and it is an approximation.

Being born in later cohorts reduces the intensity of a third birth, ceteris paribus. Cohort effects only play a role in second parity.

Some of the coefficients in the 'artificial' estimation for the old cohort are significantly different from the 'normal' estimation. However, they do not affect the nature of our conclusions. Coefficients that were significant under the 'normal' specification still are under the 'artificial' one and they do not change sign.

Table 6: Timing to 3^{rd} Child

Variables		*Cohort 1945–60*		*Cohort 1961–77*	
		Coefficient	*Haz. Ratio*	*Coefficient*	*Haz. Ratio*
	NW	-0.782** (0.250)	0.458	-1.892** (0.752)	0.151
Regions	*NE*	-0.474** (0.227)	0.622	0.148 (0.457)	1.160
Omitted	*CMadrid*	-0.733** (0.216)	0.481	-1.033 (0.698)	0.356
Category	*C*	-0.309* (0.183)	0.734	0.206 (0.367)	1.229
is S	*E*	-0.527** (0.175)	0.590	-0.482 (0.400)	0.617
	Canaries	0.074 (0.263)	1.077	0.262 (0.660)	1.300
Siblings		0.052** (0.021)	1.054	0.004 (0.051)	1.004
DivPar *Yes=1*		-0.124 (0.358)	0.884	-0.507 (0.455)	0.602
Religious *Yes=1*		-0.253 (0.206)	0.776	0.378 (0.427)	1.459
AgeAt2C		-0.081* (0.024)	0.992	-0.109** (0.063)	0.897
MenT2C		-0.210* (0.043)	0.811	-0.239** (0.100)	0.787
TwoGirls *Yes=1*		0.324** (0.154)	1.383	0.467 (0.306)	1.594
TwoBoys *Yes=1*		-0.045 (0.127)	0.956	0.323 (0.291)	1.381
WorkTaste *Yes=1*		0.194** (0.117)	1.214	0.180 (0.271)	1.197
Female	*E2*	-0.148 (0.132)	0.862	-0.721** (0.290)	0.486
Education	*E3Voc*	-0.545** (0.310)	0.580	0.520 (0.615)	1.682
Omitted E1	*E3GrPo*	-0.021 (0.387)	0.980	-1.843** (1.135)	0.158
Partner	*E2P*	-0.415** (0.195)	0.661	0.026 (0.633)	1.026
Education	*E3VocP*	-0.120 (0.344)	0.887	-0.931 (1.039)	0.394
Omitted E1	*E3GrPoP*	-0.093 (0.299)	0.911	0.901 (0.748)	2.461
Schm12 *Yes=1*		0.211 (0.432)	1.235	0.542 (0.654)	1.719
Emplo12 *Yes=1*		-0.213 (0.150)	0.808	-0.293 (0.330)	0.746
Unemrf12		-0.015 (0.011)	0.985	-0.036 (0.025)	0.965
Tempf12				0.001 (0.016)	1.001
Cohorts	*1950–54*	-0.353** (0.160)	0.703		
Omitted 1945–49 and	*1955–60*	-0.450** (0.224)	0.638		
1961–65 for Old and	*1966–77*			-0.705 (0.473)	0.494
Young respectively					
Log likelihood		-2014.6		-374.3	
N subjects		824		436	
N observations		78561		28289	

*Significant at 10% level.

**Significant at 5% level.

[1]Standard errors in brackets.

8.2 Male Sample Analysis

Up to now the paper deals with the decision to marry and have children from the women's perspective, controlling for their social and labour market characteristics. Note that partner's information is scarce since we can only account for their education. The reason is that there is no retrospective records about partner's characteristics in the female sample.

We are aware that men's contribution to the drop in fertility should be further explored. That is, it is not only women's labour market situation but also men's that has caused the decline in fertility in Spain. The increase in unemployment rates and temporary contracts has occurred in both sexes. Theory forecasts a negative relationship between male unemployment and fertility.

Since the FFS survey was also undertaken for a sample of men, it is worth analysing their family formation. Unfortunately, the size of the sample is smaller (there are 1992 completed interviews compared to 4021 we had for women), which makes only reasonable the estimation up to first child. We proceed as in the female study by splitting the estimation into two cohorts: *Cohort 1945–60* and *1961–77*. Our variables are practically the same except for the fact that we do not include *TasteWork*.[30] Accordingly, we control for male regional unemployment rates and the proportion of total male contracts that are temporary.

Table 7: Number of Subjects in Male's Sample

	Cohort 1945–60		*Cohort 1961–77*	
	Marriage	1^{st} *Birth*	*Marriage*	1^{st} *Birth*
Total	784	639	1204	374
Exits	676	614	396	267
Censored	108	25	808	107

8.2.1 Timing to Marriage

Results in Table 8 show that the main determinants of marriage in *Cohort 1945–60*[31] are the fact of being at school, which increases the duration to marriage, and being employed, which reduces it.[32] An individual who is employed has a probability of exit to marriage in the next month twice as large the probability of an individual who is not. Being enrolled in education decreases the hazard by 53%. Regional unemployment rates are not

[30] As discussed by Angrist and Evans (1998) and Ahn and Mira (2001), male employment is certainly exogenous in fertility choices. Consequently, we do not need to deal with corrections for potential endogeneity between participation and fertility as we did for our female's sample.

[31] The estimation has been also done with the fiction of censoring individuals in 1980 so as to make it comparable to *Cohort 1961–77* in terms of censoring. The target of this exercise is to check if the estimates are significantly different under both specifications (old cohort and 'artificial' old cohort). Results show that they are not, which means that one can rely more on the description and comparison of both old and young cohort.

[32] Both variables are lagged six months.

Table 8: Timing to Marriage

Variables		*Cohort 1945–60*		*Cohort 1961–77*	
		Coefficient	*Hazard Ratio*	*Coefficient*	*Hazard Ratio*
	NW	-0.186 (0.159)	0.830	-0.042 (0.241)	0.958
Regions	*NE*	-0.458* (0.167)	0.632	-0.534** (0.263)	0.586
Omitted	*CMadrid*	-0.223 (0.178)	0.800	-0.433** (0.255)	0.649
Category	*C*	-0.379** (0.152)	0.684	-0.270 (0.210)	0.764
is S	*E*	-0.039 (0.127)	0.962	-0.225 (0.191)	1.253
	Canaries	0.140 (0.239)	1.150	0.233 (0.177)	1.262
Siblings		0.0004 (0.017)	1.0004	0.073** (0.024)	1.075
DivPar Yes=1		-0.076 (0.127)	0.927	-0.005 (0.149)	0.995
Religious Yes=1		0.153** (0.085)	1.165	0.398** (0.108)	1.488
Female	*E2*	0.034 (0.093)	1.035	-0.167 (0.136)	0.846
Education	*E3Voc*	-0.031 (0.190)	0.969	0.163 (0.272)	1.177
Omitted E1	*E3GrPo*	0.073 (0.152)	1.076	-0.691** (0.256)	0.501
Schm6 Yes=1		-0.753** (0.206)	0.471	-1.113** (0.238)	0.329
Emplo6 Yes=1		0.927** (0.139)	2.527	0.472** (0.139)	1.603
Unemrm6		-0.009 (0.009)	0.990	-0.019 (0.013)	0.981
Tempm6				-0.013 (0.011)	0.988
Cohorts	*1950–54*	0.240** (0.110)	1.272		
Omitted 1945–49 and	*1955–60*	0.272** (0.144)	1.312		
1961–65 for Old and	*1966–70*			-0.124 (0.176)	0.884
Young respectively	*1971–77*			-0.152 (0.349)	0.859
Log likelihood		-3980.93		-2350.3	
N subjects		784		1204	
N observations		121438		131938	

*Significant at 10% level.

**Significant at 5% level.

[1]Standard errors in brackets.

significant. Neither is the education level. Religion increases the hazard by 16%.

In *Cohort 1961–77*, a man with a graduate or postgraduate degree has an exit rate that is 50% smaller than the one of someone with only a primary degree. Enrolment in education reduces the hazard of marriage by 67%. A religious person has a probability of exit to marriage 49% greater than a non-religious one.[33] Employed men have an exit rate much greater than non-employed men. Both the regional unemployment rates and the proportion of temporary contracts negatively affect the hazard rate but their coefficients are not significant. The worsening of the male labour market has partly contributed to

[33]Similar to women, religion seems to play a greater role in the young cohort. This may be due to the fact that, in previous generations, everybody 'had' to be religious and follow the 'rules' of society. Nowadays, differences in behaviour between those who are or are not religious are probably greater.

the delay in marriage and, consequently, the postponement of births in the young cohort.

Our results suggest that unemployment at micro level (note that spells of non-employment are highly related to unemployment in the male's sample) rather than at macro level (unemployment rates) is the main individual reason for postponing marriage. We therefore observe that being employed is crucial for getting married in both cohorts. This is different from the female analysis in the old cohort. In that case, working women were less likely to get married in the next month, ceteris paribus.

8.2.2 Timing to First Child

Table 9 shows that any region has a smaller exit rate to first birth relative to the South in both cohorts. An extra year on age of marriage has no impact on the hazard in *Cohort 1945–60* but it significantly reduces the intensity in *Cohort 1961–77*. In general, higher levels of male education affect the hazard positively, although coefficients are not significant. In our female sample we obtained the reverse effect. It is interesting to observe that partner's education (which here implies female's education) postpones significantly first child in *Cohort 61-77*, which is in accordance with our finding in the female sample.

Surprisingly being employed does not increase the hazard of first birth. Regional unemployment rates only affect negatively in the old cohort. It seems that the major impact of economic indicators on fertility comes through their influence on the timing to marriage. That is, non-employment partly causes the drop of fertility through the delay in marriage and consequently, in births (since the age of marriage increases the duration to the birth of the first child). Thus, spells of unemployment reduce indirectly fertility by postponing marriage. These results are consistent with the paper by Ahn and Mira (2001). Although they use a different survey with annual units of time, they also show that non-employment spells reduce the probability of getting married. In their analysis, being employed has a minor effect on births due to sample selection. Those who do not have jobs will not marry, which means that they are not eligible for births. The same explanation can be applied to our findings.

Table 9: Timing to 1^{st} Child

Variables		*Cohort 1945–60*		*Cohort 1961–77*	
		Coefficient	*Hazard Ratio*	*Coefficient*	*Hazard Ratio*
	NW	-0.336** (0.166)	0.714	-0.448 (0.297)	0.639
Regions	*NE*	-0.308* (0.173)	0.735	-0.957** (0.349)	0.384
Omitted	*CMadrid*	-0.394** (0.195)	0.674	-0.514 (0.325)	0.598
Category	*C*	-0.125 (0.164)	0.883	-0.230 (0.263)	0.795
is S	*E*	-0.461** (0.137)	0.631**	-0.799 (0.236)	0.450
	Canaries	-0.068 (0.256)	0.934	-1.237** (0.364)	0.290
Siblings		0.016 (0.018)	1.012	0.011 (0.033)	1.011
DivPar Yes=1		-0.072 (0.121)	0.931	-0.009 (0.305)	0.992
Religious Yes=1		0.078 (0.091)	1.081	0.166 (0.135)	1.181
AgeMa		0.015 (0.014)	1.015	-0.097** (0.041)	0.908
Male	*E2*	0.0008 (0.104)	1.001	0.304 (0.395)	1.355
Education	*E3Voc*	-0.393* (0.212)	0.675	-0.852 (0.389)	1.729
Omitted E1	*E3GrPo*	0.103 (0.173)	1.109	0.379 (0.385)	1.461
Partner	*E2P*	0.285* (0.172)	1.329	-0.584 (0.395)	0.558
Education	*E3VocP*	0.106 (0.239)	1.112	-0.852* (0.520)	0.423
Omitted E1P	*E3GrPoP*	0.020 (0.255)	1.021	-0.862* (0.473)	0.422
Schm12 Yes=1		0.438** (0.218)	1.550	0.280 (0.312)	1.324
Emplo12 Yes=1		0.180 (0.153)	1.197	-0.308* (0.182)	0.735
Unemrm12		-0.017* (0.009)	0.983	0.003 (0.016)	1.000
Tempm12				0.009 (0.013)	1.009
Cohorts	*1950–54*	0.135 (0.119)	1.145		
Omitted 1945–49 and	*1955–60*	0.050 (0.151)	1.051		
1961–65 for Old and	*1966–70*			-0.421** (0.210)	0.657
Young respectively	*1971–77*			-0.125 (0.429)	0.882
Log likelihood		-3413.90		-1315.66	
N subjects		639		374	
N observations		17303		9130	

*Significant at 10% level.

**Significant at 5% level.

[1]Standard errors in brackets.

9 Conclusions

The aim of the paper is to analyse the effects of labour market instability, employment status, education, social and demographic characteristics on the timing of family formation. Our motivation is to understand further the low fertility rate in Spain. We focus on both female and male individuals and separate our sample into two different cohorts: *Cohort 1945–60* and *Cohort 1961–77*. We next summarise our main findings.

The labour market both at the individual and at the aggregate level is crucial for family formation and its impact is different for men and women.

We have some evidence that the phenomenon of the late-leaving of the parental home in Spain has been enforced by the unstable labour market, particularly from the woman's perspective. Whereas regional unemployment does not affect the timing of marriage and first child for men, it significantly postpones both states for women. The increased proportion of temporary contracts also reduces the likelihood of women marrying.

Employment at the individual level is a key factor for marriage. Men who are employed marry faster in both cohorts. However, employed married men do not have a greater probability of having a birth, ceteris paribus. Male employment accelerates family formation through increasing the likelihood of marriage.

Interestingly, a woman's employment status has a different impact on the likelihood of getting married in the two cohorts. While being employed has a negative impact on the chances of marrying in *Cohort 1945–60*, it has a positive effect in *Cohort 1961–77*. One explanation could be that the role of women in society has changed substantially. Before, women left their jobs in order to build up a family. Nowadays, women wish to develop a working career and do not marry until they are well settled in their job. Modern women work both for personal development and economic reasons (caused by an increase in living standards and housing prices). This view is supported by the fact that a taste for work is not significant in the timing of marriage in the old group but it delays marriage in the young cohort. A complementary reason is related to the meaning of individual non-employment. Female unemployment rates have risen in the last two decades and were very high when the young cohort was at the standard age of marriage. Thus, individual-non-employment is more likely to imply inactivity in *Cohort 1945–60* than in *Cohort 1961–77*. We expect this to have an effect on our estimates.

Married women who work postpone having their first child in both cohorts, ceteris paribus. This is due to their greater opportunity cost of having children and the lack of facilities to enable employed women to combine job and family. We find that working part-time does not impact differently on our hazards since part-time work is hardly an option in Spain (e.g. in 1987, 13.7% work part-time and one third of those involuntary). Thus, the Spanish government may have a role in developing policies that help to reconcile fertility and participation such as the provision of child-care or an increase in the flexibility of working hours (i.e the voluntary choice of full *vs* part-time hours).

Demographic factors rather than employment status are the main contributors in the hazard of third child. In fact, age at second child and spell between first, together with female's education explain the timing of third birth. A similar result was found by Harvey (1996). Interestingly, in the old cohort, the wish to have a boy in the family influences positively the hazard to the third child.

Female employment status also affects negatively the chances of having a second child in both cohorts for the same reasons. In the timing to the third child, this variable is negative but not significant. Rather than being employed, other factors (especially demographic) are the main determinants of the chances of a third birth.

Becker (1960) suggests that a high level of education is linked to low fertility because of the implied higher opportunity cost of having children. We find that education postpones marriage in *Cohort 1961–77* and by delaying household formation it negatively affects fertility. Furthermore, we observe that highly educated married women delay the first birth, especially in *Cohort 1961–77*.

The impact of education on the timing of the second child is less clear-cut. In *Cohort 1945–60*, the coefficient of education in the hazard function is positive and significant among those who have a vocational degree. It is interesting to notice that in *Cohort 1961–77*, women with a graduate or post-graduate degree are far more likely to compress their first and second child. This suggests that those graduate women who overcome the barrier of first birth are faster to their second birth, compared to women with a primary degree. The coefficient of education turns out to be negative in the estimation of the hazard rate for the third child, which implies that graduate and post-graduate women who have children prefer the so-called two-child norm.

Household income that is exogenous to women's employment is expected to influence positively the probability of expanding the family (Becker (1960)). We use partner's education as a proxy. However, we do not find the predicted values. This could partly be due to the fact that partner's education is not accurate for accounting for external income.

Among our social background covariates, religion is the most important since it significantly reduces the time to marriage for both men and women.

The stylised factors in Spain since the 70s are: a rise of female employment, an increase of overall unemployment, a fall in male employment, a rise in temporary contracts and an increase in education. In our analysis, we show that male employment reduces the timing to marriage. Since male employment rates have fallen, we expect a decline in fertility by delaying demographic processes. We observe that a rise in instability (i.e. unemployment and temporary contracts) postpones female marriage, which in turn impacts negatively on fertility. We also have evidence that female employment postpones childbearing. Since female employment rates have risen since the 70s, we again expect a drop in fertility. Simultaneously, we find that higher levels of female education postpones marriage and first birth. Therefore, the growing years in female schooling also explains the decline in family size. All these factors have contributed to the drop in fertility. If we

would like to reverse the declining path in fertility, we need to accomplish three things: first, we should reverse the impact of female employment on childbearing. The fact that female employment postpones motherhood suggests that there is lack of reconciliation between family and work. We believe that the government should introduce policies that facilitate the combination of participation and fertility. This can be achieved by increasing both the availability of public child-care and flexibility of the number of hours in periods of childcare. Second, we should reduce female instability in the labour market. Third, we should implement policies to raise male employment.

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A Labels for the variables

Table 10: Variable Labels

E1	Dummy (1 if highest education is primary degree; omitted category)
E2	Dummy (1 if highest education is secondary degree)
E3Voc	Dummy (1 if highest education is vocational tertiary degree)
E3GrPo	Dummy (1 if highest education is university degree)
E1P	Dummy (1 if partner's highest education is primary degree; omitted)
E2P	Dummy (1 if partner's highest education is secondary degree)
E3VocP	Dummy variable (1 if partner's highest education is vocational degree)
E3GrPoP	Dummy (1 if partner's highest education is university degree)
Religious	Dummy (1 if individual's is religious)
Siblings	Number of siblings
WorkTaste	Dummy (1 if working one year after completing school)
DivPar	Dummy (1 if parents divorced)
AgeMa	Age of marriage
AgeAt1C	Age at first child
AgeAt2C	Age at second child
MenT1C	Months between marriage and first child
MenT2C	Months between first child and second child
Girl	If first child was a girl
TwoGirls	If both first and second children were girls
TwoBoys	If both first and second children were boys
DivPar	Dummy (1 if parents divorced)
Emplo12	Dummy (1 if employed 12 months ago)
Schm12	Dummy (1 if at school 12 months ago)
Unemrf12	Female regional unemployment rates 12 months ago
Tempf12	Female proportion of temporary contracts at national level 12 months ago
Unemrm12	Male regional unemployment rates 12 months ago
Tempm12	Male proportion of temporary contracts at national level 12 months ago
NW	North-West region
NE	North-East region
CMadrid	Madrid region
C	Centre region
E	East region
Canaries	Canaries Islands region
S	South region (Omitted category)
Cohort 1945–49	Individual is born 1945–49 (Omitted category in *Old Cohort* estimation)
Cohort 1950–54	Individual is born 1950–54
Cohort 1955–60	Individual is born 1956–60
Cohort 1961–65	Individual is born 1961–65 (Omitted category in *Young Cohort* estimation)
Cohort 1966–70	Individual is born 1966–70
Cohort 1971–77	Individual is born 1971–77

B Tables

Table 11: Ideal Number of Children for a Spanish Family[1] 1960–77

Number of Children	*Cohort 1945–60*	*Cohort 1961–77*
0	0.5%	1.1%
1	3.4%	5.6%
2	47.7%	53.2%
3	20.0 %	17.8%
1 or 2	3.1%	4.0%
2 or 3	16.0%	11.9%

[1]Table does not show % for more than 3 children.

Table 12: Timing to Marriage. Structural Form.

Variables		*Cohort 1945–60*		*Cohort 1961–77*	
		Coefficient	*Hazard Ratio*	*Coefficient*	*Hazard Ratio*
	NW	0.076 (0.112)	1.079	0.140 (0.111)	1.150
Regions	*NE*	0.026 (0.117)	1.027	-0.298** (0.125)	0.742
Omitted	*CMadrid*	0.066 (0.114)	1.068	-0.120 (0.123)	0.886
Category	*C*	0.071 (0.108)	1.073	0.153 (0.102)	1.165
is S	*E*	0.166* (0.094)	1.180	-0.050 (0.091)	0.952
	Canaries	0.252 (0.175)	1.286	0.119 (0.163)	1.126
Sibling		0.008 (0.013)	1.008	0.016 (0.015)	1.016
DivPar *Yes=1*		-0.094 (0.201)	0.910	0.110 (0.143)	1.116
Religious *Yes=1*		0.270** (0.100)	1.310	0.290** (0.087)	1.337
Female	*E2*	-0.080 (0.069)	0.923	-0.245** (0.079)	0.783
Education	*E3Voc*	-0.239* (0.134)	0.788	-0.402** (0.138)	0.669
Omitted E1	*E3GrPo*	-0.035 (0.178)	0.965	-0.430** (0.144)	0.651
Schm6 *Yes=1*		-0.718** (0.149)	0.488	-1.357** (0.115)	0.257
$\widehat{PEmplo}$ *Yes=1*		-0.179** (0.078)	0.836	0.183** (0.087)	1.201
Tempf6				-0.009* (0.005)	0.991
Cohorts	*1950–54*	-0.035** (0.085)	0.965		
Omitted 1945–49 and	*1955–60*	0.172 (0.083)	1.187		
1961–65 for Old and	*1966–70*			-0.074 (0.101)	0.928
Young respectively	*1971–77*			-0.316* (0.180)	0.729
Log likelihood		-6666.1		-7158.5	
N subjects		1150		2228	
N observations		133001		214492	

*Significant at 10% level.

**Significant at 5% level.

[1]Standard errors in brackets.

Table 13: Timing to 1^{st} Child. Structural Form.

Variables		*Cohort 1945–60*		*Cohort 1961–77*	
		Coefficient	*Hazard Ratio*	*Coefficient*	*Hazard Ratio*
	NW	0.034 (0.118)	1.035	-0.276** (0.128)	0.759
Regions	*NE*	0.012 (0.122)	1.012	-0.254* (0.148)	0.776
Omitted	*CMadrid*	0.060 (0.119)	1.061	-0.352* (0.142)	0.703
Category	*C*	0.219* (0.112)	1.245	-0.058 (0.116)	0.943
is S	*E*	-0.071 (0.100)	0.931	-0.284** (0.104)	0.753
	Canaries	0.112 (0.182)	1.119	-0.0004 (0.181)	0.999
Sibling		0.033* (0.013)	1.034	-0.001 (0.017)	0.999
DivPar *Yes=1*		-0.119 (0.212)	0.888	-0.0003 (0.106)	0.999
Religious *Yes=1*		0.0003 (0.106)	1.0003	0.280** (0.105)	1.324
AgeMa		-0.020* (0.010)	0.981	-0.074** (0.022)	0.929
WorkTaste *Yes=1*		-0.003 (0.070)	0.997	-0.237** (0.097)	0.789
Female	*E2*	-0.028 (0.072)	0.973	-0.086 (0.010)	0.918
Education	*E3Voc*	0.260* (0.154)	1.297	-0.382** (0.186)	0.682
Omitted E1	*E3GrPo*	-0.169 (0.186)	0.845	-0.389* (0.202)	0.678
Partner	*E2P*	-0.088 (0.141)	0.916	-0.029 (0.228)	0.971
Education	*E3VocP*	-0.013 (0.200)	0.987	0.131 (0.308)	1.140
Omitted E1P	*E3GrPoP*	-0.318* (0.182)	0.728	0.085 (0.256)	1.088
Schm12 *Yes=1*		-0.142 (0.177)	0.868	-0.050 (0.150)	0.951
$\widehat{PEmplo}$ *Yes=1*		-0.292** (0.104)	0.745	-0.256** (0.124)	0.774
Tempf12				0.001 (0.005)	1.001
Cohorts	*1950–54*	-0.047 (0.089)	0.954		
Omitted 1945–49 and	*1955–60*	-0.027 (0.088)	0.973		
1961–65 for Old and	*1966–70*			-0.240** (0.114)	0.786
Young respectively	*1971–77*			0.067 (0.204)	1.069
Log likelihood		-6104.0		-4959.9	
N subjects		1041		1024	
N observations		26064		25435	

*Significant at 10% level.

**Significant at 5% level.

[1]Standard errors in brackets.

Table 14: Timing to 2^{nd} Child. Structural Form.

Variables		*Cohort 1945–60*		*Cohort 1961–77*	
		Coefficient	*Hazard Ratio*	*Coefficient*	*Hazard Ratio*
	NW	-0.382** (0.130)	0.682	-0.232 (0.181)	0.793
Regions	*NE*	-0.443** (0.135)	0.642	0.080 (0.206)	1.083
Omitted	*CMadrid*	-0.135 (0.126)	0.874	-0.317 (0.199)	0.728
Category	*C*	-0.156 (0.121)	0.856	-0.263* (0.155)	0.769
is S	*E*	-0.234** (0.109)	0.791	-0.182 (0.143)	0.834
	Canaries	-0.137 (0.193)	0.872	-0.336 (0.259)	0.714
Sibling		0.021 (0.014)	1.021	0.029 (0.022)	1.029
DivPar *Yes=1*		-0.016 (0.233)	0.985	-0.018 (0.143)	0.982
Religious *Yes=1*		0.106 (0.125)	1.112	0.079 (0.153)	1.082
AgeAt1C		-0.024** (0.011	0.976	0.002 (0.030)	1.002
MenT1C		-0.176** (0.031)	0.839	-0.051 (0.046)	0.950
Girl *Yes=1*		-0.004 (0.073)	0.996	-0.137 (0.099)	0.872
WorkTaste *Yes=1*		0.014 (0.073)	1.014	-0.064 (0.104)	0.938
Female	*E2*	0.121 (0.082)	1.128	-0.285** (0.125)	0.752
Education	*E3Voc*	0.403** (0.168)	1.496	0.018 (0.257)	1.018
Omitted E1	*E3GrPo*	0.099 (0.208)	1.104	0.546** (0.274)	1.727
Partner	*E2P*	0.059 (0.147)	1.061	-0.035 (0.283)	.967
Education	*E3VocP*	0.031 (0.222)	1.032	-0.058 (0.396)	0.944
Omitted E1	*E3GrPoP*	0.130 (0.199)	1.139	0.126 (0.328)	1.135
Schm12 *Yes=1*		-0.267 (0.275)	0.765	-0.451 (0.270)	0.992
$P\widehat{Emplo}$ *Yes=1*		-0.391** (0.099)	0.676	-0.270* (0.143)	0.763
Tempf12				-0.008 (0.104)	0.992
Cohorts	*1950–54*	-0.114 (0.095)	0.892		
Omitted 1945–49 and	*1955–60*	-0.266** (0.096)	0.767		
1961–65 for Old and	*1966–70*			-0.136 (0.169)	0.873
Young respectively	*1971–77*			-0.343 (0.341)	0.710
Log likelihood		-5220.7		-2520.8	
N subjects		1007		821	
N observations		58859		36951	

*Significant at 10% level.

**Significant at 5% level.

[1]Standard errors in brackets.

Table 15: Timing to 3^{rd} Child. Structural Form.

Variables		*Cohort 1945–60*		*Cohort 1961–77*	
		Coefficient	*Hazard Ratio*	*Coefficient*	*Hazard Ratio*
	NW	-0.620** (0.217)	0.538	-1.318 (0.631)	0.268
Regions	*NE*	-0.408* (0.221)	0.665	0.296 (0.446)	1.345
Omitted	*CMadrid*	-0.665** (0.210)	0.514	-0.651 (0.642)	0.521
Category	*C*	-0.257 (0.179)	0.773	0.398 (0.342)	1.489
is S	*E*	-0.446** (0.165)	0.640	-0.164 (0.335)	0.849
	Canaries	0.098 (0.262)	1.103	0.349 (0.653)	1.417
Sibling		0.052** (0.021)	1.054	0.004 (0.051)	1.003
DivPar *Yes=1*		-0.136 (0.357)	0.873	-0.492 (0.458)	0.611
Religious *Yes=1*		-0.261 (0.206)	0.770	0.228 (0.412)	1.256
AgeAt2C		-0.010** (0.020)	0.905	0.121** (0.063)	0.886
MenT2C		-0.214** (0.043)	0.807	-0.252** (0.100)	0.777
TwoGirls *Yes=1*		0.327** (0.154)	1.386	0.465 (0.307)	1.592
TwoBoys *Yes=1*		-0.031 (0.126)	0.970	0.328 (0.290)	1.388
WorkTaste *Yes=1*		0.188 (0.117)	1.206	0.161 (0.269)	1.174
Female	*E2*	-0.152 (0.132)	0.859	-0.675** (0.289)	0.509
Education	*E3Voc*	-0.550** (0.311)	0.577	0.548 (0.621)	1.729
Omitted E1	*E3GrPo*	-0.014 (0.388)	0.986	-1.814** (1.138)	0.163
Partner	*E2P*	-0.416** (0.195)	0.660	-0.018 (0.634)	0.982
Education	*E3VocP*	-0.122 (0.344)	0.885	-0.914 (1.039)	0.401
Omitted E1	*E3GrPoP*	-0.086 (0.299)	0.917	0.945 (0.751)	2.573
Schm12 *Yes=1*		-0.239 (0.431)	1.270	0.447 (0.650)	1.563
$\widehat{PEmplo}$ *Yes=1*		-0.224 (0.171)	0.800	-0.344 (0.410)	0.709
Tempf12				-0.0007 (0.016)	0.999
Cohorts	*1950–54*	-0.456** (0.140)	0.634		
Omitted 1945–49 and	*1955–60*	-0.666** (0.153)	0.514		
1961–65 for Old and	*1966–77*			-0.746 (0.470)	0.474
Young respectively					
Log likelihood		-2015.5		-375.3	
N subjects		824		436	
N observations		78474		28182	

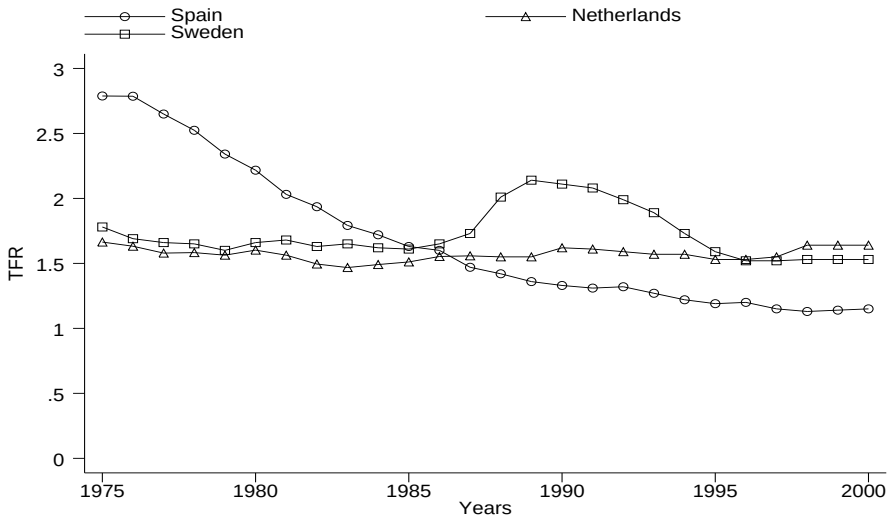
*Significant at 10% level.

**Significant at 5% level.

[1]Standard errors in brackets.

C Graphs

Figure 7: Evolution of Total Fertility Rates



C.1 Kaplan-Meier Survival Estimation with Cohort 1945–60 observed 'artificially' up to 1980

Figure 8: Survival in the Single State. Cohort Comparison

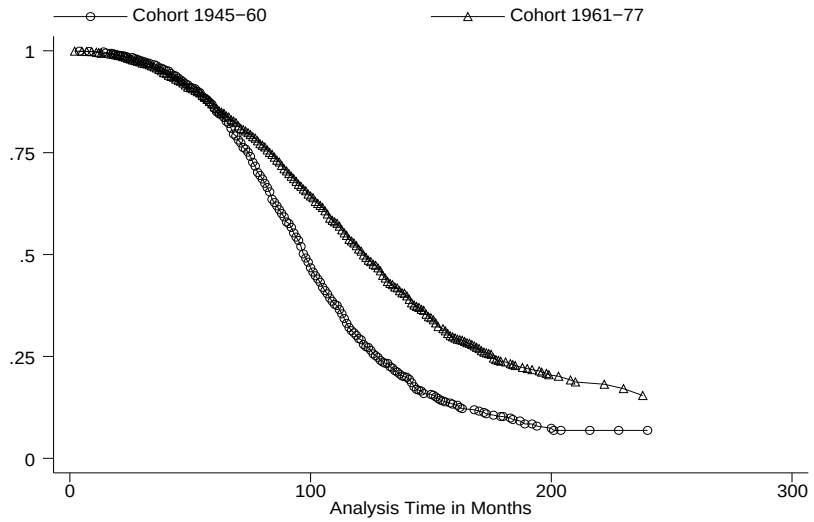


Figure 9: Survival in the Married Without Children State. Cohort Comparison

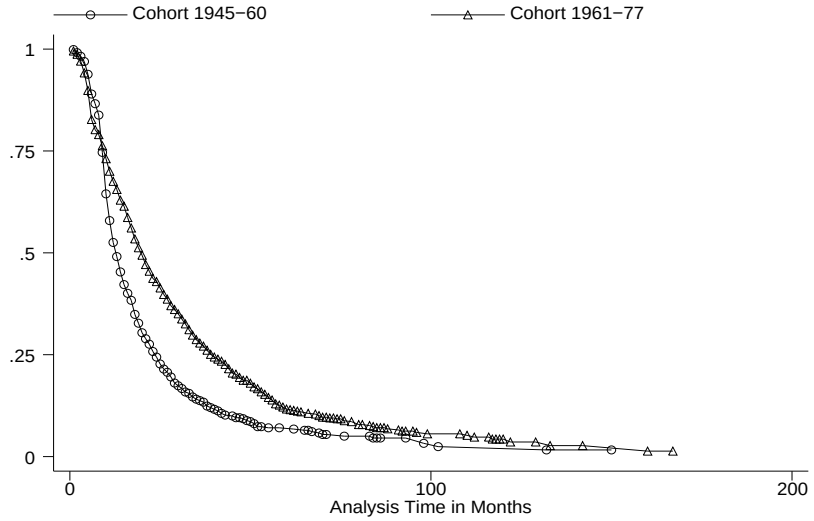


Figure 10: Survival in the Married With One Child State. Cohort Comparison

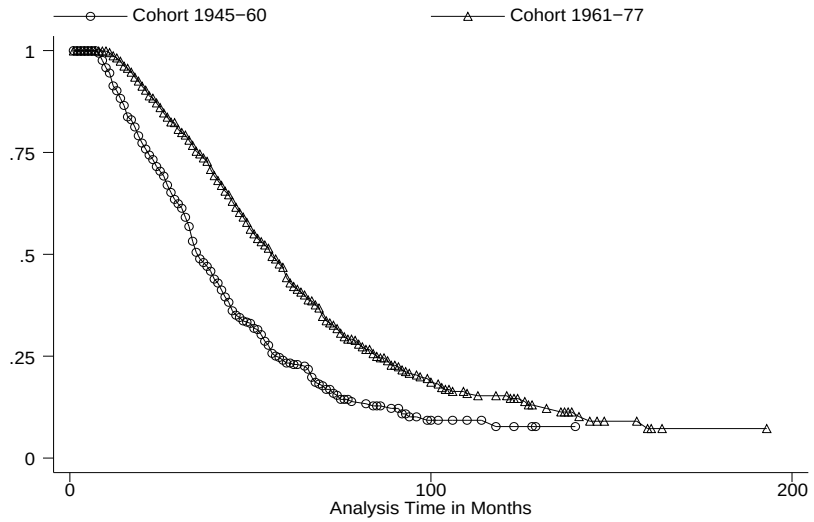
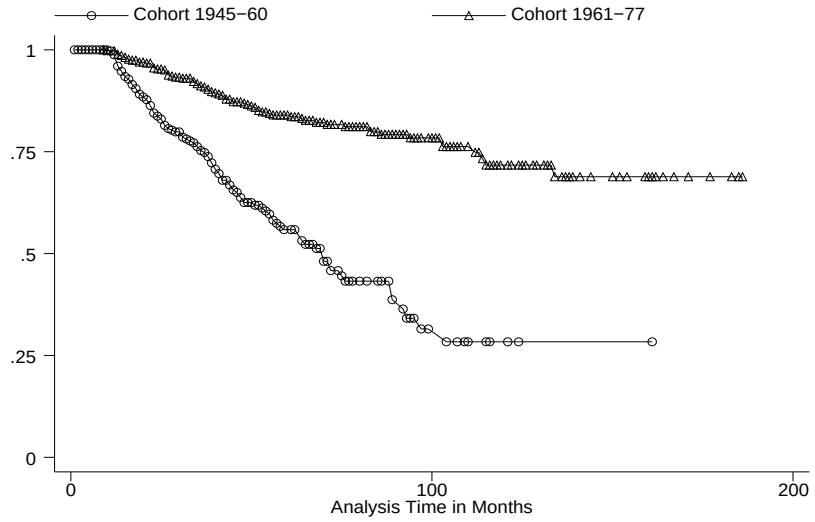


Figure 11: Survival in the Married With Two Children State. Cohort Comparison



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