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The Effects of Children on Mothers' Employment and Earnings: Evidence from Spain*

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Abstract

Using a large and rich data set from administrative sources, we study the effects of children on mothers' employment and earnings in Spain. By being able to pinpoint the event of multiple births along a twenty-year panel of women's work history, we address two methodological hurdles in this research: the omitted-variable problem and concerns about twins as a good instrument for family size. We find that the effects of fertility on mothers' labor outcomes differ by level of education. Women with only compulsory education experience falls of 17 percent in employment and 15 percent in earnings, increased duration of non-employed spells, and reductions in the likelihood of holding a secondary job or chaining contracts within a certain employment spell. Among more educated women, the employment rate drops by a mere 4 percent and earnings increase slightly in some cases. Nonetheless, a relatively higher employment rate of more educated mothers, besides unexpected changes in family size, involves costs in terms of working conditions, like holding temporary contracts. Our results indicate that mothers in general have a hard time regaining employment as revealed by the sharp increase in the take-up rate of unemployment insurance benefits around the third month after the birth. Finally, we are able to obtain some results for the impact of family size on the labor supply of a second earner (husband) in the household. For instance, we find that second earners tend to compensate for mothers' income diminution.

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1 Introduction

The two-way relationship between fertility and the labor market has been the object of much research (Browning, 1992). As children increase family responsibilities and the need for housework, parents' employment might be negatively affected. On the other hand, individuals may decide to delay or reduce fertility for work-related reasons. In this paper, we focus on estimating the effects of childbearing on women's employment and earnings in Spain. The endogeneity of fertility decisions is one of the main difficulties in carrying out this work. Researchers have used different strategies to overcome the problem of family size endogeneity. Rosenzweig and Wolpin (1980b), Bronars and Grogger (1994), and Jacobsen, Pearce, and Rosenbloom (1999), use twins in the first birth to estimate the impact of family size on a variety of outcomes. Angrist and Evans (1998) exploit parental preferences for mixed-sex siblings in order to estimate the effect of a third or higher order child. Hotz, McElroy, and Sanders (2005) use miscarriage in the first pregnancy of teenage females as an instrument for estimating the effect of delayed childbearing on annual hours of work and earnings. Using a sample of women going for fertility treatments, where consequently some women cannot become pregnant, Cristia (2008) studies the impact of a first child on the mother's employment. In a cross-country analysis, Bloom, Canning, Fink & Finlay (2009) use differences in abortion legislation to estimate the impact of fertility on female labor force participation. Bailey (2006) takes advantage of variation in state consent laws about the first birth control pill to study its impact on the timing of first births and on women's labor force participation. All these papers show that children affect their mothers' labor market performance.

To add evidence on the causal effect of fertility on the labor market, we use a large and rich dataset obtained from administrative files in Spain, the Continuous Sample of Work Histories (CSWH)[1]. These data allow us to contribute to the existing literature in four manners. First, we are able to construct a twenty-year panel of women's work history and pin down the exact months of their births. Using multiple births as an instrument for variation in family size, we can then estimate short and long-term effects of the number of children on their mothers' labor market performance. Second, we provide additional estimates for a second male worker

[1] *Muestra Continua de Vidas Laborales (MCVL)* in Spanish.

in the household, most likely the mother's spouse.[2] Third, beyond intensive and extensive margins, we explore the effect of family size on a variety of labor market outcomes. This is useful for understanding mothers' choices when facing jobs of different quality and amenities (Felfe 2007; Cáceres-Delpiano 2012). Moreover, splitting the sample into two groups--women with compulsory education at most and women who have achieved more than compulsory education--has revealed a critical distinction in gauging the effects of fertility on labor market outcomes in Spain. Fourth, distinguishing mothers according to their educational level helps clarify the connections between fertility and employment in Spain. The Spanish case is particularly interesting in both respects: since the mid-1970s, fertility plummeted and unemployment ratcheted up for more than a decade (Ahn and Mira 2001). Educational attainment and female labor force participation simultaneously increased. Investigating the effects of children on mothers' employment and earnings can shed light on the forces at work in bringing down fertility among Spanish women.

We find that family size has a negative impact on traditional measures of female labor attachment for all mothers. Nevertheless, this impact is particularly strong among mothers with lower levels of education. For mothers with only compulsory education, we find a decrease in the likelihood of employment of 17 percent and a reduction of earnings of 15 percent. For mothers with more than compulsory education, the impact on employment is less than 4 percent and the effect on earnings is insignificant or slightly positive in some cases. Moreover, among less educated mothers, an increase in family size is associated with longer duration of non-employment spells and stronger reduction in the likelihood of holding a secondary job or undergoing a sequence of contracts. We interpret these latter findings as costs of fertility in terms of an active "search" and accumulation of experience in the labor market, which is consistent with less educated women being more likely to take part-time work, become self-employed and accept fixed-term contracts. Another revealing fact, not previously shown, is a sharp increase in the unemployment insurance take-up rate by mothers around the third month after the birth. This finding suggests that childbearing makes it harder for women to regain employment.

[2] We should keep in mind that estimating the costs of childbearing in terms of labor force participation and working time for both spouses, as in Angrist and Evans (1998), is limited by the fact that we observe those who still live together as of the date of the census (Cáceres-Delpiano and Simonsen, 2012).

Therefore, one of the main findings in this paper is that distinguishing by the level of education is paramount to assess the impact of the number of children on female labor market performance in Spain. More specifically, our estimates indicate that the costs of motherhood are much higher for less educated women than for women with a greater level of education. One is tempted to frame this result in the context of falling fertility and mounting unemployment, trends that characterized Spain from the mid-1970s to the mid-1990s. To motivate this research and illuminate possible interpretations of the results, we have looked at the evolution of fertility by levels of education using quarterly samples drawn from the Spanish labor force survey for the period 1987-2012. We obtained the total fertility rate by dividing the number of children born to a specific cohort of women by all women in such a cohort. In Table 1 we compare this indicator of fertility across three selected cohorts of women --born in 1950, 1960 and 1970-- by level of education (lower secondary or less and upper secondary or more).

Table 1 shows an uneven decline of fertility, remarkably higher among less educated women. In a context of rising unemployment and lack of adequate family policies, this fact suggests that women with less human capital endured harder living and working conditions in their role as mothers of young children than women equipped with more human capital. In particular, young persons' difficulties in getting a first job throughout the 1980s (1960 cohort) and 1990s (1970 cohort) made them less suitable for forming a family and having children, thus delaying parenthood. On the other hand, increased education appears to have improved employment prospects in such a way that the substitution effect could have been partly offset by the income effect. This disadvantaged situation of less educated women could even be reinforced in a context of positive assortative mating. Although these issues warranty further consideration, we restrict ourselves to taking the facts presented in Table 1 just as a main motivation for undertaking this research.

The paper is structured as follows. In Section 2, the empirical specification and identification strategy are presented. In Section 3, we describe the data used in the analysis and the criteria applied to the construction of the samples. In Section 4, we describe the outcomes variables used to characterize the individual's labor market attachment. In Section 5, we explore the relationship between multiple births and family size. Sections 6 and 7 present the results of estimating the effect of children on mothers' and second male earners' labor market outcomes, respectively. We conclude in Section 8.

2 Identification

The following expression corresponds to the relationship of interest in the current analysis,

$$\boldsymbol{y_{it}}^{\boldsymbol{s}} = \boldsymbol{\delta_i}^{\boldsymbol{s}} + \boldsymbol{\pi_t}^{\boldsymbol{s}} + \boldsymbol{\gamma n_{it}}^{\boldsymbol{s}} + \boldsymbol{\beta X_{it}}^{\boldsymbol{s}} + \boldsymbol{\varepsilon_{it}}^{\boldsymbol{s}} \quad \text{(E.1)}$$

where ${y_{it}}^{s}$ is a specific outcome for mothers or their spouses i, at month t in the sample s; ${n_{it}}^{\boldsymbol{s}}$ corresponds to the number of children for individual i at time t and sample s, and the terms ${\delta_i}^{\boldsymbol{s}}$, and ${\pi_t}^{\boldsymbol{s}}$ are individual and time-fixed effects, respectively. Finally, ${X_{it}}^{\boldsymbol{s}}$ refers to other explanatory variables that change over time and across individuals.[3]

We are interested in parameter γ, the impact of family size on a mother's labor force attachment or performance (or her spouse's). However, it is well documented that Ordinary Least Square (OLS) estimates of equation (E.1) may be subject to an omitted variable bias (Shultz, 2007)[4]. For example, differences across individuals that define relative gains of market production over household production might be simultaneously correlated with fertility. Although the individual fixed effect, ${\delta_i}^{s}$, takes care of those factors correlated with family size and labor market variables that are fixed across time, individual factors changing over time might still be responsible for a correlation between family size and unobserved factors linked to differences in labor market outcomes.

We address the omitted-variable bias using multiple births as a source of variation in family size (Angrist and Evans, 1998; Black et al., 2005; Cáceres-Delpiano, 2006; Angrist et al., 2010; and Cáceres-Delpiano and Simonsen, 2012). Unlike the cited studies, we have a long panel of data and therefore are able to exploit its structure in order to further correct for the omitted-variable bias. Specifically, we define mb_{it}^{s} as the binary instrument, multiple births, that takes a value equal to one for a family (mother) i with multiple births at time t, and zero otherwise. Therefore, we observe the occurrence of the event --multiple births-- across individuals. Over time, we observe individual variations associated with multiple births in

[3] Other variables in the analysis are the individual's age and a dummy variable that indicates the time of a specific birth.

[4] By including fixed effects at the individual level, the model in equation (E.1) corresponds to a fixed effect model. Though these models solve the omission of factors that are constant across time at the individual level, time-varying factors correlated with the decision of fertility are still a potential source of bias. Specifically, individual characteristics or conditions that define the optimal timing for having a child could be responsible for this omitted variable bias.

comparison with variations for individuals who do not experience the event. This latter methodological innovation is possible thanks to the panel data we have at our disposal.

We do the analysis by taking into account the parity at which an increase in family size due to multiple births occurs. First, we consider mothers with one or more births (1+), where the instrument is multiple births at first birth, mb_{it}^{1}. Second, we analyze the impact for a sample of families with two or more births (2+), where the instrument is multiple births in the second delivery, mb_{it}^{2}.

Whether or not the occurrence of multiple births is an appropriate instrument depends on the legitimacy of two well-known assumptions. First, the correlation between multiple births and family size is different from zero. This assumption implies that there should be enough correlation between multiple births and family size so that an average difference in family size exists and can be properly measured. Women who experience multiple births have some ability to adjust their subsequent fertility. For example, a mother who would like two children may simply stop seeking children if, in her first birth, she delivers twins. This is particularly problematic when working with developing countries for their higher observed fertility. However, given the heterogeneity in the desired number of children and the fact that in this work we use data for Spain (which has one of the lowest fertility rates in the world), we can be sure that multiple births produce a shift in family size even at an early stage of fertility life. In the following section, we show that multiple births in fact shift the mother's number of children upward for the two subsamples.

The second assumption --non-testable-- is that there is no correlation between the instrument (multiple births) and the error term in the regression, so that any impact observed on the outcome of interest should necessarily be attributed to a change in family size. A digression on the nature of multiple births should help clarify this assumption. There are two types of twins, the most common of multiple pregnancies: identical (*monozygotic*) and fraternal (non-identical, *dizygotic*). Identical twins occur when a single embryo divides into two embryos. Identical twins have the same genetic makeup and their incidence is equal in all age groups and countries (3.5 per 1000 births). Fraternal twins occur when two separate eggs are fertilized by separate sperm. The occurrence of fraternal twins, unlike identical twins, varies and there are several risk factors that may contribute to increasing its incidence. In fact, this

correlation of fraternal twins with other factors has been a motive of concern in the use of multiple births as an instrument for variation of family size.

There are two main concerns. First, multiple births have a higher incidence among mothers undergoing fertility treatment and also among women who come from families with a previous incidence of fraternal twins. Given the sample used, the average age of mothers at first child and the cost associated with fertility treatments, we consider this not to be a serious problem in our data. Besides, there is no prior information that women act differently based on this hereditary background or that hereditary factors are associated with a particular group of the population. In this respect, we should emphasize the advantages of having panel data because it allows us to include individual fixed effects. Identification results from comparing the same mother (or family) before and after the event of multiple births, for factors fixed over time should be absorbed by the fixed effect. Therefore, a specification like the one presented in (E.1) allows for heterogeneity in terms of the reasons behind the increases in the likelihood of multiple births across individuals. By including individual fixed effect, we just need the event of multiple births at the individual level to be random and uncorrelated with factors defining a higher/lower labor attachment. A similar idea is argued in Cristia (2008), who studies the impact of fertility on a mother's labor attachment using a sample of women who underwent fertility treatment but just a random fraction of whom got pregnant. In our context, we allow for multiple births to be correlated with factors such as fertility treatments. Nevertheless, for a given individual at a specific time, the event is deemed orthogonal to other unobservable characteristics.

A second concern was raised by Rosenzweig and Zhang (2006) when studying the impact of fertility on child investment in the context of Becker's quantity and quality model. It refers to the possibility that parents might allocate resources to compensate for (or reinforce) a child's endowment shock. Compared to singleton, twins and other higher-order multiple births tend to have lower birth weight, higher infant mortality and are more likely to suffer life-long disabilities if they survive (Martin and Park, 1999). Thus, mothers (parents) might react by reallocating time between the labor market and household production to compensate for the shock on children's endowment. The endowment hypothesis invalidates the exclusion restriction because multiple births trigger other causal channels beyond that of fertility. Unlike Rosenzweig and Zhang (2006), we cannot verify the robustness of the results by controlling for birth weight of children as a measure of their initial endowment. However, as shown in

Caceres-Delpiano (2012) and in Caceres-Delpiano and Simonsen (2012), the overall results tend to be robust to the inclusion of measures of initial endowment of children[5].

In spite of being unable to verify the lack of correlation between the instrumental variable and the error term, we are confident that this assumption is fulfilled for several reasons: a) The random nature of multiple births; b) the fact that we compare the same individual before and after the event of multiple births; and c) the choice of the unit of analysis.

Assuming that the impact of family size as presented in equation (E.1) is constant across observations may be unrealistic given the obvious heterogeneity in household preference, production technology and constraints. Extensive literature on program evaluation has mentioned the importance of addressing this heterogeneity in the impact of a specific "treatment." Heckman (1997) calls attention to the role of the heterogeneity and the sensitivity of IV estimates to assumptions about how individuals internalize this heterogeneity in their decisions to be part of the treated group (i.e., the selection of family size). Angrist and Imbens (1994) have shown that IV estimates can be interpreted as a "Local Average Treatment Effects" (LATE) in a setting with heterogeneity in the impacts and individuals whose actions take this heterogeneity into account.[6] In this case, the IV estimate identifies the impact of an increase in family size for those families who, due to multiple births, end up having more children than they otherwise would have. Angrist et al. (2010) show that in the specific case of using the event of multiple births as an instrument, and due to its perfect *compliance,*[7] the LATE can be interpreted as an Average Treatment Effect on the Non-

[5] Caceres-Delpiano (2012), analyzing a sample of 42 developing countries, provides evidence that the impact on mothers' labor outcomes is robust to the inclusion of children's birth weight as a proxy for children's endowment, as well as to the use of gender composition as an instrument. Specifically, the use of gender composition should not suffer from a contamination coming from shocks in children's endowment. Cáceres-Delpiano and Simonsen (2012) obtain robust results using two alternative instruments –gender composition and multiple births--for the impact of family size with US data.

[6] When γ^s is homogenous, multiple births as a valid instrument (as well as any other valid instrument), will allow us to identify all the relevant parameters such as the ATE, ATT or ATUT since they all are the same (Heckman et al., 2006). Nevertheless, with γ^s being heterogeneous and individuals sorting in the gains of family size, the interpretation of the parameter estimated with multiple births (or other instruments) is less straightforward.

[7] The average treatment effect on the untreated can be expressed as a weighted average of the average treatment on "Never-takers" and the average treatment on "Compliers" (see Angrist and Pischke, 2009, for details). The terms of "never-takers" and "compliers" come from the analogy with randomized trials where some experimental subjects comply with the randomly assigned treatment but some do not. Those who do not get "treatment" when randomly assigned to do so are those defined as never-takers. Nevertheless, in the specific case of multiple births, mothers (families) who wanted to

Treated. That is, the population of compliers is composed of all those mothers who wanted to stay at a specific family size, s, as their ideal number of children, yet were nevertheless pushed to a bigger family size as a product of multiple births, that is, the "Non-Treated" at s. Therefore, the instrument identifies the cost of an increase in family size for families who sought an "s" pregnancy (child) but received one (twins) or more (triplets, quadruplets, etc.) additional children. In fact, this is the population of individuals whom, at higher values of "s", policymakers have in mind when defining the benefits of family planning program initiatives or the magnitude of the cost in terms of labor participation faced by those mothers (families) who have chosen to stop their reproductive life.

The panel structure of the data permits us to study the dynamic impact of an increase in family size on mothers. Specifically, we estimate the following variant of equation (E.1),

$$\boldsymbol{y_{it}}^{\boldsymbol{s}} = \boldsymbol{\delta_i}^{\boldsymbol{s}} + \boldsymbol{\pi_t}^{\boldsymbol{s}} + \sum_v \boldsymbol{\gamma^v n_{it}}^{\boldsymbol{s}} * \mathbf{1}_v\{\boldsymbol{a_v} \leq \boldsymbol{t} \leq \boldsymbol{b_v}\} + \boldsymbol{\beta X_{it}}^{\boldsymbol{s}} + \boldsymbol{\varepsilon_{it}}^{\boldsymbol{s}} \qquad \text{(E.2)}$$

with 1{*} as an indicator function that takes a value of one when the logic statement {*} is true, and zero otherwise. In this second specification, the parameter of interest is $\gamma^{\boldsymbol{v}}$, which represents the cost of an increase in family size in period $[a_v, b_v]$ in comparison to those periods previous to the birth. In this second specification, the instrument is the variable $mb_{it}^{s} * 1\{a_v \leq t \leq b_v\}$, which measures the variation of family size due to multiple births in period $[a_v, b_v]$. In a context of a homogenous treatment, equation (E.2) is informative about the dynamic effect of an expected increase in family size. In a context of intrinsic heterogeneity, equation (E.2) allows us to observe the impact of family size on different types of compliers as well. In the short term, we will be estimating the impact for individuals for whom multiple births means a change in the desired fertility but also the impact for those, for whom multiple births means just a change in the timing of child $s+1$, in case the desire fertility is greater than s. In the longer run, on the other hand, equation (E.2) will capture the impact just for the sample for individuals for whom multiple births means a change in the complete fertility. Finally, using a specification similar to the one in equation (E.2), but including a series of leads (placebo dummies), we check for the robustness of the results. We do this by analyzing the timing of the change in the selected outcomes due to an event of

stay at a specific family size but face a multiple birth in that "s" birth cannot avoid being pushed (treated) to a family size bigger than s. Therefore, there are not "never-takers" when using multiple births as a source of variation of family size.

multiple births. A causal interpretation of the findings would be weakened if we found an impact on a specific outcome among mothers who eventually experience a multiple birth, but the periods preceding the event of multiple births or the information about them is revealed[8].

3 Data

The data used in this study is the Continuous Sample of Work Histories (CSWH) (*Muestra Continua de Vidas Laborales - MCVL*) issued for the years 2005-2011. The CSWH is obtained by matching several administrative registers from Social Security files, the Continuous Registry of Municipal Inhabitants, and Tax Agency records. The sample is composed of individuals, selected randomly, among all people who had a relation with the Social Security system at some point in time during the reference year, previous to the one in which the dataset is released. The sample size is 4% of the universe, resulting in more than a million individuals for each year. In every release, the longitudinal structure of the sample is preserved, where less than 10% of individuals are lost or incorporated every year.

For each individual in the sample, information about her labor market activity goes as far back in time as Social Security records permit --about twenty years counting back from 2005. The database is constructed in such a way that workers can be tracked down through all their past employment relations registered with Social Security. Dates about the start and end of each employment contract are recorded. Demographic characteristics such as gender, age, place of birth and household composition are also available.

Household composition, obtained from the Continuous Registry of Municipal Inhabitants (*Padrón continuo de habitantes*), allows us to use the CSWH for this research despite an unfortunate feature of the Registry: it does not specify parental relationships between members of the household.[9] Thus, to link children with their mother, we have designed a simple algorithm. First, we restrict the sample to households where there is at least one adult woman. Second, we discard households with two or more adult women when their ages make it difficult to identify the mother of the children in the household. To check the goodness of

[8] Parents can learn whether or not they are pregnant with multiple births during their first echography, recommended by the Spanish Genecology Society to be scheduled during the first quarter of pregnancy.

[9] Although the main goal of the CSWH is to provide information about work histories of the individuals sampled, the dataset has been enriched by matching these individuals with the Registry of Municipal Inhabitants (*hoja del pardrón*).

this algorithm, we apply it to the 2001 Spanish census, where family relationships are available. The result is that 98.6% of households with individuals younger than 25 have just one female member whose age makes her the likely mother. By restricting the sample to households with only one potential mom, our algorithm permits us to correctly identify 98.7% of children's mothers in the household.

To increase accuracy in relating mothers to their children in our dataset, we apply several restrictions to the selection of the final sample. First, we exclude households where the individual is foreign-born, because they are deemed more likely to include several family units. Second, we focus on households where the CSWH sampled individual is a woman aged 25-55 in 2011. Any other adult women at home are ruled out as children's mothers on the grounds of age differentials. Third, we restrict the analysis to households where the age of the oldest individual identified as the child of a woman is less than 25 years old in 2011. Finally, once children are identified for each of the sample years (2005-2011), we drop those observations with missing information on children's gender or date of birth, or because household composition is inconsistent across different sample years.

We use two subsamples of individuals. The first sample refers to mothers born between 1965 and 1970. The CSWH for years 2005-2011 allow us to reconstruct the work history of these women through much of their fertile life. The second sample refers to households where we observe two income earners, the mother and her potential husband. This latter sample is made possible by matching two individuals in the CSWH. We define all men with an age difference lower than 5 years with respect to the mother and who shared the home at some point in the period 2005-2011 as potential husbands. In order to ensure a reasonable sample size, the sample of second male earners is not restricted to specific birth cohorts of their potential spouse. Specifically, it is composed for individuals born between 1951 and 1986.

An important variable in this dataset is the level of education. The original variable in the CSWH is obtained from the Continuous Registry of Municipal Inhabitants and is considered of poor quality. However, we have benefited from additional measures of the educational level from two other data sources, the job seekers registry and the registry of contracts. Individuals in the CSWH were matched with those in these two other data sources by the Ministry of Labor in cooperation with the Public Employment Service. The main advantage of this match is a much better measure of the level of education.

4 Outcome Variables

To investigate the effects of children on mothers' labor market attachment and performance, we consider three sets of outcomes. The first set contains six variables that characterize the traditional extensive and intensive margins. 1) A dummy variable equal to one if the person is employed during the period and zero otherwise. 2) The number of days worked during the period. 3) The individual's base for social security contribution, which is an indicator of earnings. 4) Days worked part-time. 5) Days of effective work, obtained by converting part-time work into a full-time equivalent. 6) Receipt of unemployment insurance (UI), which is a dummy variable equal to one in case the individual receives UI and zero otherwise.

The second group of outcome variables refers to characteristics of employment spells and employment dynamics. 1) The variable "multiple contracts" equals one for individuals who hold more than one single contract in a given period, and zero otherwise. Individuals holding more than one contract in a month not only capture the option of a secondary job but they also capture an active search in the labor market. Although a secondary job serve to supplement earnings for families and to diversify their sources of income, multiple job holding have drawbacks, e.g., more difficulties for planning household chores and health problems. 2) The variable "chaining" is a dummy that takes the value one for individuals who within a certain employment spell are transiting from a second or higher order contract without passing through an unemployment spell. A higher fraction of individuals chaining contracts within an employment spell not only reflect the distinctive temporality present in Spain but also the "skill" of individuals to be renewed or actively search so an employment spell is not interrupted. 3) Duration of non-employment spell. 4) Duration of the current spell, regardless of its type. Since the variable "chaining" can be measured just for individuals in an employment spell, or for duration of non-employment for individuals within a non-employment spell, we make the distinction for these two variables between current and current or last (current/last) spells. By defining the variable "Last/current spell chaining," for example, we include in this definition people in an employment spell as well as those who are in a non-employment spell for which we use the information about the last employment spell.
Finally, the last group of outcome variables refers to the type of employment relationships: 1) Full-time versus part-time; 2) Indefinite versus fixed-term; and 3) wage and salary work

versus self-employment. We define three dummy variables, "full-time," "temporary," and "self-employed," which take the value one if the individual has a full-time contract, a fixed-term contract, or is self-employed, respectively. Additionally, we add a dummy variable, "short contract," that takes the value one if the individual is in a contract whose duration is a year or less, and zero otherwise. As we did with two of the variables in the previous set of outcomes, for these four variables we distinguish between the employment relationship in the current employment spell and those in the current/last employment spell.

The descriptive statistics for the above-defined variables and other variables included as controls in analyses are presented in Table 2. The average age of the individuals in the panel is approximately 32 years, which we observe for an average period of 20 years for mothers and 23 years for a second male earner. The average age at the beginning of the panel is approximately 18 years of age. The individual's age at first birth is around 28 years, while the age at second birth (samples 2 +), is approximately 32 years. The average number of children throughout the panel for samples 1+ is approximately 1.03 children. For the sample of individuals who have more than two children during the period under analysis (samples 2+), the average number of children is around 1.3.[10]

A panel of 29,000 mothers over 260 months (approximately 9 million observations) makes estimations very demanding in computation time. For this reason, we reconverted the monthly panel into a quarterly panel for the analysis of mothers but we keep the monthly frequency for the analysis on a second earner in the household.

By looking at outcome variables, we find that an average of approximately 70% of women are employed during the period of analysis. The average real monthly earnings is around 900€ for mothers and approximately 1000€ for their potential husbands. The monthly number of days of work is on average around 27 for mothers and 20 for second male earners at home (including those workers without a job). This difference in favor of women is explained by the fact that the sample of mothers is composed of those cohorts born between 1965 and 1970, that is, in the middle of their working life, while the sample of second male earners is composed of cohorts born between 1951 and 1986; in other words, some of them are in an

[10] A value below two is explained by the fact that we observe an individual for some periods before the second birth takes place, which pushes down the average number of children over the period of analysis.

early stage of their working life and the older cohorts are already or close to retirement. Nevertheless, this difference in the days worked disappears when we look at the measure of days of work adjusted for days of part-time work. Regarding the percentage receiving Unemployment Insurance (UI), the average figure is approximately 10% of mothers and 6% of male second earners. Concerning the type of employment or contract, mothers (male earners) are 55 (80) percent in full-time jobs, 30 (26) have temporary contracts and 15 (24) percent are self-employed.

Table 3 presents the descriptive statistic for mothers by level of education: lower secondary or less ("Just Compulsory") and upper secondary or more ("More than Compulsory"). Consistent with a higher opportunity cost associated with more human capital, we observe that mothers with more than compulsory education: are more likely to be employed, work more days (after adjusting for days of partial work), enjoy higher monthly earnings, more likely to be in full-time employment, and less likely to have a temporary contract or a short-term contract (a year or less). Also, more educated mothers are less likely to receive unemployment insurance benefits.

5 Multiple Births and Family Size

A high correlation between multiple births and family size is a testable necessary condition to ensure the validity of the instrument**,** because only in that case an average difference in family size exists and can be properly measured. To estimate the relationship between multiple births and family size**,** we first estimate the following equation:

$$\boldsymbol{n_{it}^{s} = \delta_i^{s} + \pi_t^{s} + \theta mb_{it}^{s} + \beta X_{it}^{s} + \varepsilon_{it}^{s}} \qquad \text{(E.3)}$$

OLS estimates of the impact of multiple births on the number of children, θ, are presented in Table 4. Estimates for the specification above, with and without controls,[11] are presented in

[11] The specification without controls includes the dummy variable for multiple births, individual fixed effects and an indicator for the time of the specific birth. In addition to these variables, the specification with controls includes a time-fixed effect by birth cohort (a flexible form to control for the age of the individual), a time-fixed effect interacted with a dummy variable indicating whether or not an individual has just compulsory education, and year of birth effects interacted with the dummy indicating compulsory education attainment at most.

columns 1 and 2 for mothers, and in columns 3 and 4 for second male earners. Comparing the specifications with and without controls, it appears that the impact of multiple births is robust to the inclusion of other variables in the model. This finding is important because it shows that at least on the basis of these observed variables, multiple births are not strongly correlated with other variables, and that the positive impact observed on the number of children is not due to the correlation with these other variables. Second, for both samples and specifications, there is a positive and statistically significant coefficient associated with multiple births (with a significance level of 1%) and the F statistics for the null of weak instruments, over the critical values.

The magnitudes reported in Table 4 show that the event of multiple births increases the number of children. Specifically, a family that experiences multiple births has approximately 0.6 to 0.9 more children than another family which in the same birth experiences a singleton. Our estimates are in line with those reported in previous studies that use the same source of identification (Angrist et al. 2010; Cáceres-Delpiano 2006; Angrist and Evans 1998). For Israel, Angrist et al. (2010) find an impact of multiple births ranging from 0.43 to 0.69, depending on the sample considered**,** and Black et al. (2005) find an impact ranging from 0.67 to 0.82 for Norway.

As we already mentioned, in a context of intrinsic heterogeneity**,** there are two types of compliers. In the short term**,** we have those individuals for whom multiple births means a change in the desired fertility but also the impact for those for whom multiple births means just a change in the timing of the $(s+1)$ child, in case the desired fertility is greater than s. In the long term, the compliers should be those for whom multiple births just alter the desired family size. We investigate this composition of compliers by estimating the following model,

$$\boldsymbol{n_{it}}^{\boldsymbol{s}} = \boldsymbol{\delta_i}^{\boldsymbol{s}} + \boldsymbol{\pi_t}^{\boldsymbol{s}} + \sum_{\boldsymbol{v}} \boldsymbol{\theta^v mb_{it}}^{\boldsymbol{s}} * \mathbf{1}_v\{\boldsymbol{a_v} \leq \boldsymbol{t} \leq \boldsymbol{b_v}\} + \boldsymbol{\beta X_{it}}^{\boldsymbol{s}} + \boldsymbol{\varepsilon_{it}}^{\boldsymbol{s}} \qquad \text{(E.4)}$$

The OLS estimates of the impact of multiple births between $\boldsymbol{a_v}$ and $\boldsymbol{b_v}$ quarters after the birth, $\boldsymbol{\theta^v}$, is reported in Table 5. The points estimates show a significant impact beyond 16 quarters after the birth, which, given the average spacing observed in Spain, confirms that the group of

compliers not only captures the impact in the timing of children but also the impact of an increase in family size.

Finally, Table 6 reports the estimates of the impact of multiple births on family size by mothers' level of education. As the table reveals, the impact of multiple births does not seem to be driven by one particular level of education because the magnitude of the impact is similar across the two groups of women. This finding lends us support to study the effects of fertility on labor market outcomes by level of education. Moreover, it dispels concerns that the compliers in the case of multiple births are just among the groups with higher levels of education.

6 The Effect of Children on Mothers' Labor Market Outcomes

The two-Stage Least Squares (2SLS) estimates of the impact of the number of children on the variables that characterize the labor market participation of mothers are presented in Tables 7 to 9. Each column corresponds to a specific outcome, while the rows of the table correspond to different sub-samples distributed in three panels: panel I for the entire sample, panel II for individuals with compulsory education, and panel III for individuals with more than compulsory education. For each of the panels, two estimates are reported. The first row refers to households with one or more children (1+) and the second row refers to households with two or more children (2+).

Table 7 reports the impact of the number of children for the outcome variables that characterize the traditional extensive and intensive margins. The results for the entire sample of mothers (panel I, sub-samples 1+ and 2+) indicate that an additional child is associated with a reduction in the likelihood that a mother is employed by approximately 5 percentage points**,** which in terms of the sample means corresponds to approximately a 7 percent decrease. Though we do not observe an impact on the total number of days worked, we do observe a reduction in the measure of days worked after adjusting for days of partial work of approximately 4 days in a quarter. This result is consistent with the increase in days of partial work observed for the sample 1+. Nevertheless, for the sample 2+, we even observe a reduction among the days of partial work, which is consistent with the idea that individuals have "margins" to adjust when facing an unexpected increase in family size. Nevertheless,

when mothers have fewer margins or are increasingly constrained, i.e., already have children (at 2+), they are faced with no alternative but to adjust on extensive margins. In line with this hypothesis, we observe a reduction in earnings at 2+ but an increase at 1+. Is that increase in earnings distributed among all mothers? The analysis by level of education shows that it is not.

Estimations by the mother's level of education reveal considerable differences in the results (panels II and III). The likelihood of being employed is reduced by 10 percentage points (17 percent in terms of the sample mean) among lower educated women for both samples, 1+ and 2+; and by 3 percentage points (4 percent) among more educated mothers, only for the sample 2+. In addition, it is just among mothers with lower levels of education that a reduction in earnings is observed, approximately 250€ per quarter (15 percent in terms of the sample mean). On the other hand, among mothers with more than compulsory education, we observe an increase in earnings for the sample 1+ and an insignificant change for the sample 2+. That is, among more educated women with stronger preferences for a smaller family size (compliers in the sample 1+), an unexpected change in family size rather than reducing earnings is associated with an increase of them. However, still among more educated mothers but among those with preferences for a bigger family size (sample 2+), the increase in family size now is not associated with an increase in earnings, which is explained by the decrease in the likelihood of being employed by 2.5 percentage points. Thus, these results indicate that the number of children have a heterogeneous effect on mothers' labor attachment. Among mothers with a relatively lower "market" opportunity cost, that is, with lower levels of human capital or stronger preferences for household production (more children), an increase in family size seems to foster specialization in household production. Whereas mothers with a relatively higher opportunity cost and a smaller desired family size react to an unexpected change in the number of children appear to increase their specialization in market production.

Are these changes long-lasting or short-lived? The dynamic analysis for this first group of outcomes is presented graphically. For the entire sample, results are reported in Figure 1 (1+) and in Figure 2 (2+). Figures 3 and 4 report the results by level of education for samples 1+ and 2+, respectively. The results lend support to the finding that mothers with lower levels of education bear a higher cost of increasing family size. By contrast, more educated mothers are the ones driving the increase in earnings in the static specification reported in Table 7. But now we can see that this positive impact on earnings (sample 1+) is short-lived because 16

quarters after the birth the effect wanes. The loss of earnings among less educated women, on the other hand, is apparent as long as 16 quarters after the birth for both samples. How can mothers with more education "protect" earnings? The answer lies in two other results: First, they do not experience a reduction in extensive margins (samples 1+ and 2+); and second, for some quarters, they experience an increase in the adjusted days of work (samples 1+ and 2+), which is driven by a reduction in the number of days of part-time work (sample 1+). Mothers with lower levels of education facing an increase in family size, on the other hand, not only reduce extensive margins in the short and long run, but also reduce intensive margins over the whole period under analysis. Specifically, it is among mothers with lower levels of education where there is a relatively stronger increase of part-time work in both the short and long run.

The dynamic analysis serves to uncover the effect of children on the likelihood of receiving UI in the short run. We now find that, different from the estimates in the last column of Table 7, an increase in family size raises the likelihood that the mother receives unemployment benefits during the first 9 quarters after the birth. This result is robust to the division of the sample by educational level. For the whole sample, the increase in family size causes an increase in an UI receipt of 5 percentage points, or a 50 percent increase in relation to the sample mean.

The results for the second group of outcomes (Table 8) reveal that an increase in family size reduces the probability that a mother holds more than one job in a given period. The finding that this reduction is stronger among mothers with lower levels of education for sample 1+ is consistent with two hypotheses. First, households where mothers specialize in household production require fewer market goods and therefore they are less likely to need a complementary source of income. Second, an arrangement to complement income in the form of a secondary job is hard to reconcile with a bigger family size. For example, using data for 42 developing countries, Cáceres-Delpiano (2012) find that mothers who experience an increase in family size tend to leave jobs that are harder to combine with motherhood such as jobs with a higher degree of informality. Within this group of outcomes we find as well that mothers are less likely to "chain" contracts within a spell of employment. This finding is consistent with mothers being less likely to go from job to job without an unemployment spell, i.e., have searched for work while employed. Third, though for the complete sample it looks as if an increase in family size is associated with a reduction in the duration of non-employment spells, the analysis by level of education shows that this result is driven by more

educated mothers. In fact, among mothers with lower levels of education the duration of the non-employment spells increases.[12] Finally, the last outcome that measures the duration of the spells regardless of whether they are employed or non-employed episodes shows (for sample 1+) an increase for those mothers with more education but a reduction for mothers with lower levels of education. This finding, together with an increase (decrease) in the duration of non-employment episodes for mothers with lower (higher) levels of education, indicated that an increase in family size is associated with a reduction (increase) in duration of employment episodes for this group. That is, the increase in family size entails a loss in work experience that is particularly significant among the less educated females. More educated mothers are able to reduce the duration of non-employment spells with the consequent gain in tenure and experience.

In Figures 5 to 8, we present the results of the dynamic analysis for the six outcomes, following the same structure used previously. First, the impact of children on the likelihood of holding two or more contracts is negative across all periods and for both educational levels. Although this negative impact is stronger for lower educated mothers, an overlap of the confidence intervals does not rule out that the impact is similar to that among more educated mothers. Nevertheless, just for the group of mothers with lower levels of education, we can ensure a statistical significance, not only in the long run, but also in the short-run. Second, results from an analysis that would not allow for differences in the impact of family size in the short and long run, like those reported in Tables 7 to 9, would oversee a positive impact on chaining contracts in the short run, which is driven by the sample of more educated mothers. Nevertheless, in the long run (beyond 4 years after the birth) for both groups of women, we obtain a negative impact on the likelihood of chaining contracts within an employment episode. Finally, the dynamic analysis reveals the nature of the differences in the impact of children on the duration of non-employment spells by educational levels. Before the third year after the birth, more children reduce duration of non-employed spells, regardless of mothers' education. Beyond the fourth year after the birth, the impact becomes positive for mothers with lower levels of education. That is, all mothers with a stronger preference for a smaller family size (sample 1+) continue to search actively in the short-run**,** but only mothers with more than compulsory education are able to go on in active search four years after the birth.

[12] For less educated mothers of 2 or more children, we observe a reduction in the duration of non-employment spells if they are currently non-employed. As already indicated, this measure refers to duration of non-employment spells of non-employed mothers, thus with a censored duration.

Then, if we were to pick "winners" in terms of their ability to buffer the costs of an unexpected increase in family size, they would be compliers mothers with more than compulsory education in sample 1+ (with a relatively stronger preference for a smaller family size).

For the complete sample of mothers in sample 1+ and in sample 2+ (panel I) there are some noteworthy differences in the impact of an increase in family size on contract characteristics (Table 9). At 1+, an increase in the number of children reduces the probability of full-time employment and increase the probability of holding a temporary contract and of being self-employed. For the sample 2+ on the other hand, family size increases the likelihood of full-time employment and reduces the likelihood of being in temporary employment. Estimations by levels of education revealed that the latter results are driven by more educated mothers.

This suggests first that there is no free lunch. Among more educated mothers in sample 1+**,** as our previous findings show, it is where we did not observe a reduction in extensive margins**.** We found a reduction in the number of days of partial work, and we observed a reduction in the duration of non-employment episodes; that is, an (unexpected) increase in family size is associated with higher specialization in the labor market. This higher specialization should eventually imply an accumulation of human capital (experience, tenure) that would lead to permanent contracts and full-time employment, but we observe the opposite result. For sample 2+, though, we observed a reduction in the probability of being employed. The evidence shows that mothers who stay in the labor market keep jobs of better quality.

On the other hand, for mothers with lower levels of education in the sample 1+, among which we found the biggest reduction in terms of extensive and intensive margins as well as an increase in the duration of non-employment episodes, we observe that an increase in family size is associated with a reduction in the likelihood of holding a full-time job, an increase in mothers holding a temporary contract and an increase in mothers who are self-employed. For this group of mothers, who have a lower level of education but for the sample 2+, though we observe a reduction in temporal contracts and an increase in self employment, the channel seems to be a reduction in extensive margins since, because when we define this variables also using the information about the last contracts for those that are not employed, we do not observe a change associated with an increase in family size.

As done previously, figures 9 to 12 present the dynamic analysis of outcomes characterizing the employment relationship. Figures 11 and 12 indicate once again that when a significant difference in level of education exists, the higher cost is for less educated mothers. Specifically, for sample 1+ beyond four years after the birth, we observe an increase in the likelihood that a contract has duration inferior to twelve months among mothers with lower levels of education. Also for the sample 1+, though for both groups beyond the four years after the birth there is a reduction in the likelihood of holding a full-time contract, mothers with more than compulsory education in the short run are the ones for whom there is an increase in the likelihood of holding a full-time job. For sample 2+, we find that while an increase in family size induces an increase in the likelihood of holding a full-time job for mothers with more education, this probability falls for mothers with just or less than compulsory education.

Finally, using a specification similar to the one in equation (E.2) but including a series of leads (placebo dummies), we check the robustness of the results by analyzing the timing of the change in the selected outcomes due to an event of multiple births. A causal interpretation of the findings would be weakened if we found an impact in a specific outcome among mothers who eventually experience multiple births, but the periods preceding the event of multiple births or the information about them is revealed. Nevertheless, parents can learn whether or not they are pregnant with multiple births during their first echography, recommended by the Spanish Genecology Society to be scheduled during the first quarter of pregnancy. The results of the analysis are presented in figures 13 to 18. In each of the figures**,** two vertical lines are drawn. The first line from left to right represents the time of conception approximately (3 quarters before birth). The second line represents the date of birth. For none of 16 outcomes in the two samples with the exception of chaining in sample 1+, we find that multiple births have a significant impact previous to conception.

7 The Effect of Children on Second Male Earners' Labor Market Outcomes

The results for a second male earner, which we address as the potential husband of a woman identified as the mother of the children in the household, are presented in Tables 10 and 11.[13]

[13] As the CSWH is a random sample of employed individuals, it is possible to observe two or more working members of the same family. This allows us to identify a second male earner in the same

Table 10 presents the results for the first two groups of outcomes: Panel I presents the results for the five outcomes that we defined as the traditional extensive and intensive margins; and Panel II contains the groups of outcomes intended to describe the transition between employment and non-employment spells. Finally, Table 11 reports the findings for the outcomes characterizing the type of contracts. For each of these three outcomes groups, the impact of fertility is reported for samples 1+ and 2+. Nevertheless, given the considerable, smaller sample size, we restrict the analysis to the complete samples and we do not divide the sample by the level of education.[14]

Looking at the two first groups of outcomes, Table 10, we observe a considerable difference in the impact of fertility between samples 1+ and 2+. On the one hand, for the sample 2+ we find evidence that is fully consistent with the hypothesis that a second earner would compensate for losses caused by a reduction of the mother's labor attachment. Specifically, we observe an increase in the likelihood of being employed, an increase in the number of days worked, a reduction in the probability of using UI, an increase in the likelihood of holding a secondary job, an increase in the likelihood of chaining contracts within an employment spell, and an increase in earnings. For sample 1+, on the other hand, an increase in family size with the exception of the outcomes of "earnings" and "multiple contracts" has an impact with the sign opposite to the one found in 2+. Nevertheless, as well as for sample 2+, we still observe that an additional child in the family is associated with an increase in earnings. Part of this increase in earnings is explained by the increase in the likelihood that an individual would hold more than one contract in a month, but the answer is also found in the type of contract held for this second earner. For sample 1+, we observe that an increase in family size increases the likelihood that a second earner is working full time, reduces the likelihood of holding a temporary contract and reduces the likelihood of being self-employed. In fact, for this same group of outcomes but for sample 2+, we observe the impact of family size has the opposite sign for these outcomes. Therefore, the results indicate that a second earner (husband) tends to compensate the reduction of income taking place in the household. Nevertheless, not all individuals "make ends meet" with the same recipe. Some individuals

household. To make him more likely to be the mother's spouse, we focus on men with an age difference of 5 or less years with the sampled mother in the same household.

[14] The identification in our analysis comes from the presence of multiple births and the comparison of outcomes before and after the event. Because multiple births are rare, a large sample of individuals is required. Out of 30,000 mothers with one or more children (sample 1+), we identified 540 multiple births. We also observe twins for 30 families in our sample of twenty-five hundred second male earners.

increase their participation in the labor market but sacrifice “the quality” of the job (sample 2+). Other individuals increase the quality of the job and reduce some intensive and extensive margins (sample 1+).

8 Conclusions and remarks

In this paper, we use administrative data from Spain to investigate the effects of children on mothers’ employment and earnings. We tackle the omitted-variable problem with a plausible instrument for family size. As in many previous studies, we chose the event of multiple births. A major difference with preceding work, though, is that we take advantage of having data on mothers’ labor market outcomes on a monthly base for a twenty-year period. Thus, the panel structure of the data has been critical in allowing us to show that the effects of children on mothers’ employment and earnings are more clearly exposed in a dynamic context. In particular, heterogeneity of the cost of childbearing is emphasized. If the effects of a third child are quite similar across households, the effects of a second child vary over time, diminishing with children’s age and vanishing in some cases. Therefore, only with a long panel of data on women’s work history has it been possible to gauge the temporary nature of the effects of children on their mothers’ labor market attachment.

Another important novelty in our paper is that the effects of fertility on mothers’ labor outcomes --at least in Spain-- greatly differ by their level of education. Women with compulsory education at most experience falls of 17 percent in employment and 15 percent in earnings. Other effects of childbearing are increased duration of non-employed spells and reductions in the likelihood of holding a secondary job or chaining contracts within a certain employment spell. As regards more educated women, their employment rate drops by 4 percent and earnings increase slightly in some cases. This relative advantage of having more education does not prevent women, regardless of schooling, from the costs of becoming mothers in terms of labor market outcomes. Our results indicate that mothers in general have a hard time regaining employment if they stop working because of motherhood. This is revealed by a striking and sharp increase in the take-up rate of unemployment insurance benefits around the third month after the birth.

Moreover, unlike previous work, we have been able to provide some results for the impact of family size on the labor supply of a second male earner (husband) in the household.

Specifically, we find that second earners tend to compensate for mothers' income diminution. Nevertheless, while some individuals increase their participation in the labor market but sacrific**e** "the quality" of the job (sample 2+), other individuals increase the quality of the job~~,~~ and reduce some intensive and extensive margins (sample 1+).

Our work contributes to shedding light on the relationship between mothers of young children and the labor market. The analysis has been particularly illuminating for a country that in less than two decades went from having a relatively high fertility rate to one of the lowest in the world. Many factors may have contributed to this demographic development. However, we interpret the results in this paper as an indication of the particularly harsh labor market conditions faced by less educated mothers in Spain. This prompted a sharper drop in fertility and probably encouraged increased schooling, which pushed fertility further down. More research is needed to assess whether balancing work and family continues to be a hurdle for younger generations. Although high levels of immigration have increased fertility and slowed down the aging of the population, our findings suggest that the current situation of skyrocketing unemployment and feebler family support may hasten lower-educated (both native and immigrant) women to have fewer and fewer children.

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Table 1
Total fertility rates by levels of education and cohort in Spain.

	Lower secondary or less			Upper secondary or more			
Cohort	Total Fertility Rate (1)	Points change across cohorts	% Change across cohorts	Total Fertility Rate (2)	Points change across cohorts	% Change across cohorts	TFR ratio (1)/(2)
1950	2.16	-	-	1.65	-	-	1.31
1960	1.78	-0.38	-17.67	1.45	-0.20	-12.15	1.23
1970	1.44	-0.34	-19.14	1.27	-0.18	-12.47	1.14

Source: Labor Force Survey (1987-2012).

Table 2
Descriptive statistics.

	Mother		Male earner	
	1+	2+	1+	2+
Employed	0.69	0.68	0.73	0.72
Days worked	27.63	27.68	20.93	20.93
	(8.83)	(8.79)	(13.97)	(13.97)
Monthly earnings	914.40	916.07	1037.80	1043.68
	(786.03)	(806.37)	(872.85)	(884.01)
Effective days worked	19.03	18.83	21.35	21.38
	(13.93)	(14.00)	(13.64)	(13.64)
Days of part-time work	3.23	3.17	0.68	0.66
	(9.28)	(9.21)	(4.43)	(4.39)
Receive unemployment insurance (UI)	0.09	0.09	0.06	0.06
Multiple contracts in a month	0.06	0.06	0.06	0.06
Last/current spell chaining contracts	0.44	0.43	0.54	0.55
Current spell: chaining contracts	0.38	0.37	0.53	0.54
Duration last/current non-employment spell	32.35	33.90	0.14	0.14
	(45.65)	(46.64)	(2.88)	(2.76)
Duration current non-employment spell	15.44	15.96	0.03	0.03
	(37.08)	(37.78)	(1.09)	(0.71)
Duration current spell	39.19	40.09	36.18	36.00
	(47.79)	(48.35)	(54.10)	(53.13)
Last/current contract: Full time	0.39	0.37	0.56	0.55
Last/current contract: Temporary	0.21	0.21	0.19	0.20
Last/current contract: Self-employed	0.10	0.11	0.17	0.18
Last/current contract: Short	0.37	0.37	0.21	0.20
Current contract: Full time	0.34	0.32	0.55	0.54
Current contract: Temporary	0.14	0.14	0.19	0.20
Current contract: Self-employed	0.08	0.09	0.17	0.18
Current contract: Short	0.20	0.19	0.19	0.19
Age of the individual	32.63	32.62	32.05	31.55
	(6.82)	(6.83)	(9.31)	(8.82)
Age at first child	28.84	27.83	28.24	28.04
	(5.24)	(4.65)	(7.28)	(5.94)
Age at the second child	32.31	32.30	32.79	32.79
	(4.48)	(4.48)	(5.55)	(5.55)
Number of children (NC)	1.03	1.28	0.91	1.12
	(0.91)	(0.99)	(0.88)	(1.02)
Complete NC	1.76	2.20	1.71	2.23
	(0.70)	(0.49)	(0.72)	(0.52)
MB first birth	0.018	0.029	0.010	0.017
MB second birth	0.014	0.014	0.012	0.012
Age first time in the panel	18.55	18.54	17.77	17.77
	(1.73)	(1.73)	(7.95)	(6.78)
Age last time in the panel	43.46	43.46	42.69	42.70
	(1.71)	(1.70)	(7.94)	(6.77)
Months in the panel	261.97	262.23	281.50	285.36
	(45.30)	(45.44)	(35.77)	(29.87)
Number of individuals	29030	18462	2672	1556

Standard deviations in parentheses. Standard deviations for proportions are not reported.

Table 3
Descriptive statistics by level of education of the mother.

	Just compulsory		More than compulsory	
	1+	2+	1+	2+
Employed	0.61	0.59	0.75	0.75
Days worked	27.11	27.11	28.04	28.10
	(9.56)	(9.58)	(8.19)	(8.11)
Monthly earnings	617.78	592.69	1146.58	1163.18
	(531.34)	(523.13)	(870.56)	(892.89)
Effective days worked	16.45	16.04	21.03	20.95
	(14.34)	(14.39)	(13.26)	(13.31)
Days of part-time work	3.43	3.35	3.07	3.04
	(9.53)	(9.42)	(9.08)	(9.05)
Receive UI	0.12	0.12	0.08	0.08
Multiple contracts in a month	0.07	0.07	0.05	0.05
Last/current spell chaining contracts	0.36	0.34	0.51	0.50
Current spell: chaining contracts	0.29	0.26	0.46	0.45
Duration last/current non-employment spell	36.18	38.26	28.59	29.69
	(48.80)	(50.08)	(41.99)	(42.63)
Duration current non-employment spell	15.40	16.03	15.47	15.90
	(38.80)	(39.82)	(35.30)	(35.68)
Duration current spell	39.93	41.45	38.59	39.04
	(49.72)	(50.93)	(46.21)	(46.26)
Last/current contract: Full time	0.30	0.28	0.46	0.45
Last/current contract: Temporary	0.24	0.25	0.18	0.18
Last/current contract: Self-employed	0.12	0.12	0.09	0.10
Last/current contract: short	0.44	0.44	0.32	0.32
Current contract: Full Time	0.24	0.21	0.41	0.40
Current contract: Temporal	0.16	0.16	0.13	0.14
Current contract: Self-employed	0.09	0.09	0.08	0.08
Current contract: Short	0.21	0.21	0.18	0.18

Standard deviations in parentheses. Standard deviations for proportions are not reported.

Table 4
OLS estimates of the impact of multiple births on number of children (first stage). Each pair of coefficient and standard error corresponds to a different regression. F-statistic for weak instruments in *italics*.

	Mothers		Male earner	
	Unconditional	Conditional	Unconditional	Conditional
1+	0.653***	0.632***	0.748***	0.713***
	[0.004]	[0.003]	[0.009]	[0.013]
	28434.25	*33899.18*	*6610.88*	*3056.54*
2+	0.935***	0.937***	0.944***	0.925***
	[0.005]	[0.003]	[0.015]	[0.013]
	28932.93	*110000*	*4057.98*	*5415.21*

Robust standard errors in parentheses; * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. The specification is the one presented in equation (E.3). The specification without controls (unconditional) includes a dummy variable for multiple births, individual fixed effects and indicator for the time of the specific birth. The second specification, conditional, additionally to the previous variables includes time fixed effect by birth cohort, time fixed effect interacted with a dummy variable indicating whether or not an individual has completed compulsory education and finally year of birth effects interacted with the dummy indicating compulsory education. 1+ and 2+ stand for the samples of individuals with one, two or more children, respectively. Stock-Yogo weak ID test critical values for 10%, 15%, 20% maximal IV size are16.38, 8.96 and 6.66, respectively.

Table 5
OLS estimates of the dynamic impact of multiple births on number of children (first stage).

	Mothers		Male earner	
Quarters since birth	1+	2+	1+	2+
[0-3]	0.711***	0.951***	0.786***	1.016***
	[0.008]	[0.007]	[0.034]	[0.030]
[4-6]	0.686***	0.947***	0.799***	1.001***
	[0.009]	[0.008]	[0.036]	[0.031]
[7-9]	0.677***	0.947***	0.974***	0.978***
	[0.009]	[0.008]	[0.036]	[0.036]
[10-12]	0.654***	0.942***	0.935***	0.967***
	[0.009]	[0.008]	[0.036]	[0.036]
[13-15]	0.641***	0.937***	0.881***	0.963***
	[0.009]	[0.008]	[0.036]	[0.036]
16 or more	0.567***	0.927***	0.617***	0.881***
	[0.004]	[0.003]	[0.014]	[0.013]
	5032.26	*15219.27*	*473.16*	*815.2*

Robust standard errors in parentheses; * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Each column presents the estimated from a different regression which specification is the one presented in equation (E.4). The controls included are individual fixed effects, indicator for the time of the specific birth, time fixed effect by year of birth cohort, time fixed effect interacted with a dummy variable indicating whether or not an individual has completed compulsory education and finally year of birth effects interacted with the dummy indicating compulsory education. 1+, and 2+ stand for the samples of individuals with one, two or more children, respectively. F-statistic for weak instruments in *italics*. Stock-Yogo weak ID test critical values for 10%, 15%, 20% maximal IV size are16.38, 8.96 and 6.66, respectively.

Table 6

Impact of multiple births on number of children (first stage) by level of education of the mother.

	Just compulsory		More than compulsory	
	Unconditional	Conditional	Unconditional	Conditional
1+	0.686***	0.670***	0.631***	0.611***
	[0.007]	[0.006]	[0.005]	[0.004]
2+	0.912***	0.933***	0.942***	0.940***
	[0.009]	[0.005]	[0.007]	[0.004]

Robust standard errors in parentheses; * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. The specification is the one presented in equation (E.3). Covariates for each of the specifications are the same as those reported in table 3.

Table 7
2SLS estimates of the impact of fertility on mother's traditional extensive and intensive margins.

			Employed	Days worked	Quarterly earnings	Effective days worked	Days of partial work	Receive unemployment insurance
I	Total	1+	-0.050***	-0.426	58.604***	-4.099***	1.093***	0.003
			[0.006]	[0.335]	[22.691]	[0.505]	[0.329]	[0.004]
		2+	-0.058***	-0.448	-89.264***	-3.941***	-1.063***	0.006
			[0.006]	[0.314]	[21.565]	[0.475]	[0.308]	[0.004]
II	Compulsory education	1+	-0.130***	0.541	-276.634***	-11.768***	2.079***	-0.001
			[0.010]	[0.572]	[26.843]	[0.811]	[0.535]	[0.007]
		2+	-0.104***	-0.532	-265.442***	-9.150***	-0.057	0.009
			[0.009]	[0.543]	[25.070]	[0.767]	[0.501]	[0.007]
III	More than compulsory	1+	-0.003	-0.990**	269.685***	0.547	0.418	0.004
			[0.008]	[0.403]	[34.034]	[0.643]	[0.416]	[0.005]
		2+	-0.026***	-0.418	34.982	-0.312	-1.732***	0.004
			[0.007]	[0.375]	[32.376]	[0.603]	[0.389]	[0.005]

Robust standard errors in parentheses; * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. The specification is the one presented in equation (E.1). The controls included are individual fixed effects, indicator for the time of the specific birth, time fixed effect by year of birth cohort, time fixed effect interacted with a dummy variable indicating whether or not an individual has completed compulsory education and finally year of birth effects interacted with the dummy indicating compulsory education.

Table 8
2SLS estimates of the impact of fertility on mother's selected outcomes.

			Multiple contracts	Last/current spell: Chaining	Current spell: Chaining	Duration last/current non-employment spell	Duration current non-employment spell	Duration current spell
I	Total	1+	-0.018***	-0.020***	-0.028***	-3.842***	-1.235**	2.743***
			[0.004]	[0.006]	[0.005]	[0.723]	[0.600]	[0.618]
		2+	-0.019***	-0.047***	-0.059***	-0.53	-3.448***	-0.013
			[0.003]	[0.005]	[0.005]	[0.675]	[0.568]	[0.588]
II	Compulsory education	1+	-0.033***	-0.054***	-0.078***	1.889*	2.023**	-2.105**
			[0.006]	[0.009]	[0.008]	[1.133]	[0.936]	[1.027]
		2+	-0.015***	-0.071***	-0.082***	3.689***	-3.009***	-0.333
			[0.006]	[0.008]	[0.007]	[1.056]	[0.882]	[0.988]
III	More than compulsory	1+	-0.009**	0.002	0.004	-8.683***	-4.009***	5.807***
			[0.004]	[0.007]	[0.007]	[0.921]	[0.770]	[0.763]
		2+	-0.022***	-0.030***	-0.042***	-4.295***	-3.797***	0.083
			[0.004]	[0.007]	[0.007]	[0.859]	[0.730]	[0.720]

Robust standard errors in parentheses; * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. The specification is the one presented in equation (E.1). The controls included are individual fixed effects, indicator for the time of the specific birth, time fixed effect by year of birth cohort, time fixed effect interacted with a dummy variable indicating whether or not an individual has completed compulsory education and finally year of birth effects interacted with the dummy indicating compulsory education.

Table 9
2SLS estimates of the impact of fertility on mother's selected outcomes.

			Last/current contract: Full Time	Last/current contract: Temporary	Last/current contract: Self-employed	Last/current contract: Short	Current contract: Full time	Current contract: Temporary	Current contract: Self-employed	Current Contract: Short
I	Total	1+	-0.021***	0.031***	0.028***	-0.010*	-0.031***	0.022***	0.024***	-0.022***
			[0.005]	[0.005]	[0.003]	[0.006]	[0.005]	[0.004]	[0.003]	[0.006]
		2+	0.008*	-0.012***	0.001	-0.015***	0.002	-0.018***	-0.004	-0.031***
			[0.005]	[0.004]	[0.003]	[0.006]	[0.005]	[0.004]	[0.003]	[0.005]
II	Compulsory education	1+	-0.036***	0.039***	0.035***	0.045***	-0.059***	0.021***	0.028***	-0.019**
			[0.008]	[0.008]	[0.005]	[0.010]	[0.007]	[0.007]	[0.005]	[0.009]
		2+	-0.031***	-0.006	-0.005	-0.001	-0.025***	-0.014**	-0.014***	-0.035***
			[0.007]	[0.007]	[0.005]	[0.010]	[0.007]	[0.006]	[0.004]	[0.009]
III	More than compulsory	1+	-0.012*	0.026***	0.024***	-0.046***	-0.013*	0.021***	0.021***	-0.026***
			[0.007]	[0.006]	[0.004]	[0.008]	[0.007]	[0.005]	[0.004]	[0.007]
		2+	0.034***	-0.016***	0.005	-0.024***	0.022***	-0.022***	0.002	-0.027***
			[0.006]	[0.005]	[0.004]	[0.008]	[0.006]	[0.005]	[0.003]	[0.007]

Robust standard errors in parentheses; * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. The specification is the one presented in equation (E.1). The controls included are individual fixed effects, indicator for the time of the specific birth, time fixed effect by year of birth cohort, time fixed effect interacted with a dummy variable indicating whether or not an individual has completed compulsory education and finally year of birth effects interacted with the dummy indicating compulsory education.

Table 10

2SLS estimates of the impact of fertility on second earner's selected outcomes.

	Employed	Days worked	Monthly earnings	Effective days worked	Days of partial work	Get unemployment insurance
1+	-0.092***	-4.947***	145.736***	-2.771***	0.005	0.046***
	[0.016]	[0.543]	[28.499]	[0.480]	[0.183]	[0.013]
2+	0.041**	3.427***	99.189***	1.173**	0.232	-0.030**
	[0.019]	[0.641]	[32.764]	[0.573]	[0.211]	[0.015]
	Multiple contracts	Last/current spell: Chaining	Current spell: Chaining	Duration last/current non-employment spell	Duration current non-employment spell	Duration current spell
1+	0.063***	-0.085***	-0.088***	-3.368**	0.037	1.69
	[0.012]	[0.020]	[0.020]	[1.568]	[0.067]	[2.620]
2+	0.084***	0.071***	0.071***	-0.52	0.008	-29.544***
	[0.014]	[0.026]	[0.026]	[0.912]	[0.038]	[3.131]

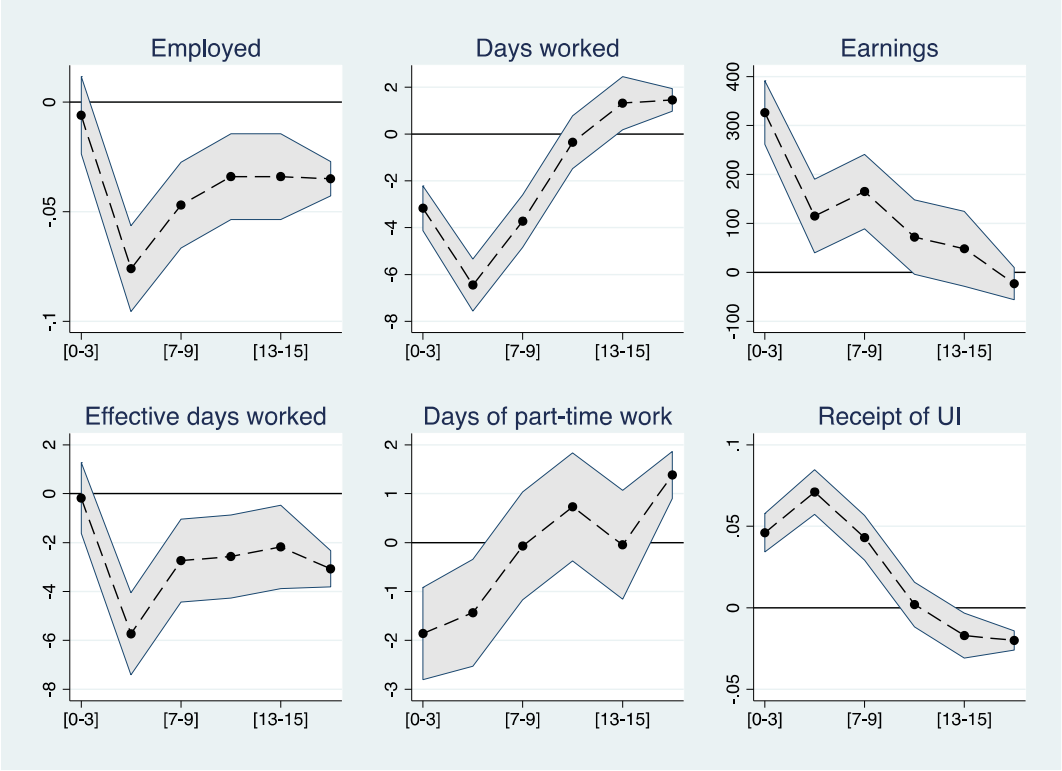
Robust standard errors in parentheses; * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. The specification is the one presented in equation (E.1). The controls included are individual fixed effects, indicator for the time of the specific birth, time fixed effect by year of birth cohort, time fixed effect interacted with a dummy variable indicating whether or not an individual has completed compulsory education and finally year of birth effects interacted with the dummy indicating compulsory education.

Table 11
2SLS estimates of the impact of fertility on second earner's selected outcomes.

	Last/current contract: Full Time	Last/current contract: Temporal	Last/current contract: Self-employed	Last/current contract: Short	Current contract: Full time	Current contract: Temporary	Current contract: Self-employed	Current contract: Short
1+	0.212***	-0.264***	-0.254***	0.037**	0.207***	-0.262***	-0.253***	0.025
	[0.018]	[0.014]	[0.014]	[0.016]	[0.018]	[0.014]	[0.014]	[0.016]
2+	-0.210***	0.219***	0.209***	-0.013	-0.212***	0.219***	0.209***	-0.016
	[0.022]	[0.018]	[0.017]	[0.020]	[0.023]	[0.018]	[0.017]	[0.020]

Robust standard errors in parentheses; * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. The specification is the one presented in equation (E.1). The controls included are individual fixed effects, indicator for the time of the specific birth, time fixed effect by year of birth cohort, time fixed effect interacted with a dummy variable indicating whether or not an individual has completed compulsory education and finally year of birth effects interacted with the dummy indicating compulsory education.

Figure 1: Dynamic impact of the number of children on mother's traditional extensive and intensive margins. Sample 1+.

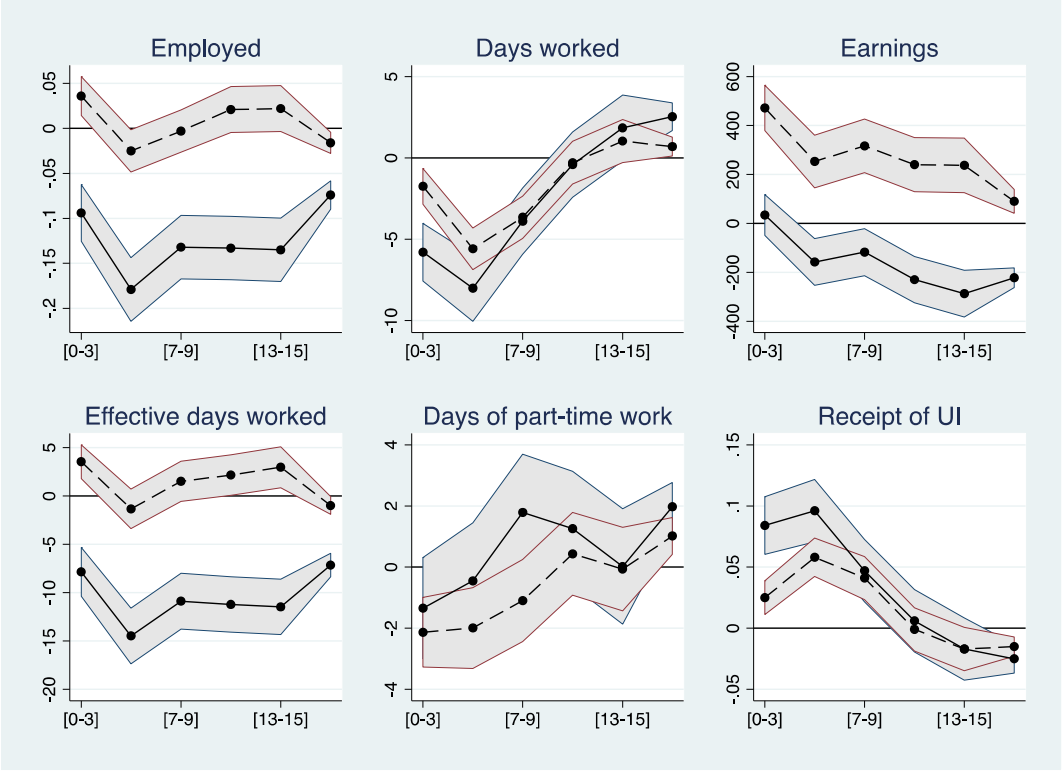


Note: Each point corresponds to the 2SLS estimates of γ^{v} in equation (E.2) that represents the cost of a growth in family size in the period show in horizontal axis in comparison to those periods previous the increase of the family size. The grey area represents the 95% confidence interval.

Figure 2: Dynamic impact of number of children on mother's traditional extensive and intensive margins. Sample 2+.

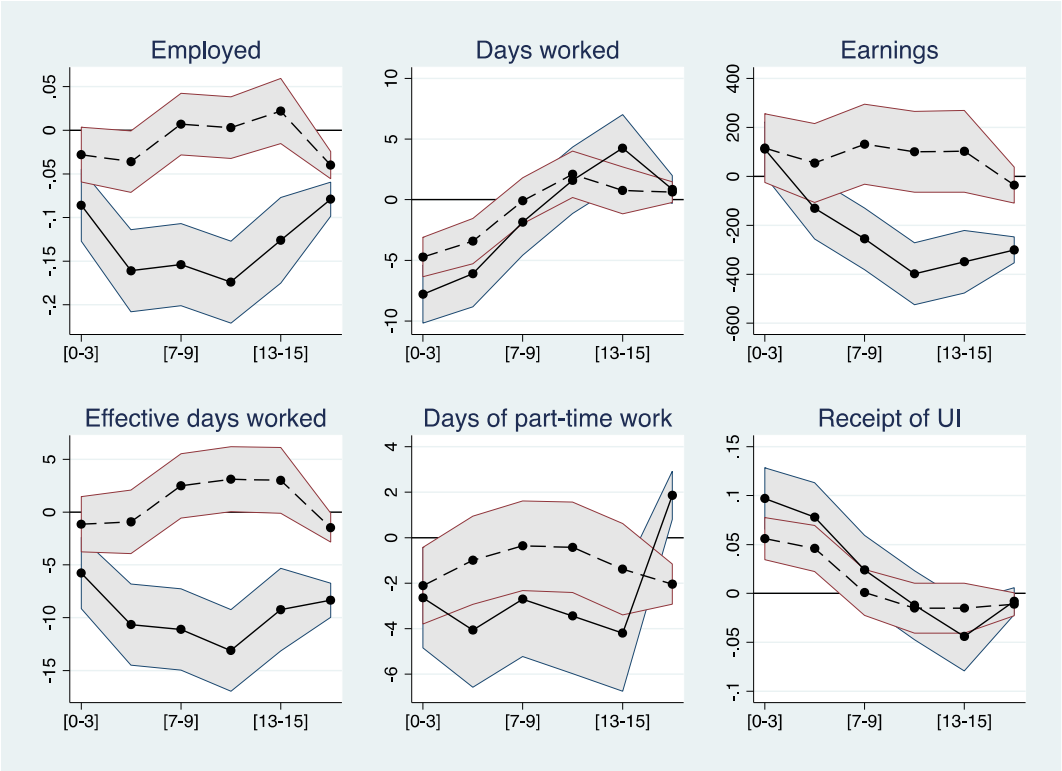
Note: Each point corresponds to the 2SLS estimates of γ^{v} in equation (E.2) that represents the cost of a growth in family size in the period show in horizontal axis in comparison to those periods previous the increase of the family size. The grey area represents the 95% confidence interval.

Figure 3: Dynamic impact of number of children on mother's traditional extensive and intensive margins. Sample 1+ by the mother's level of education.



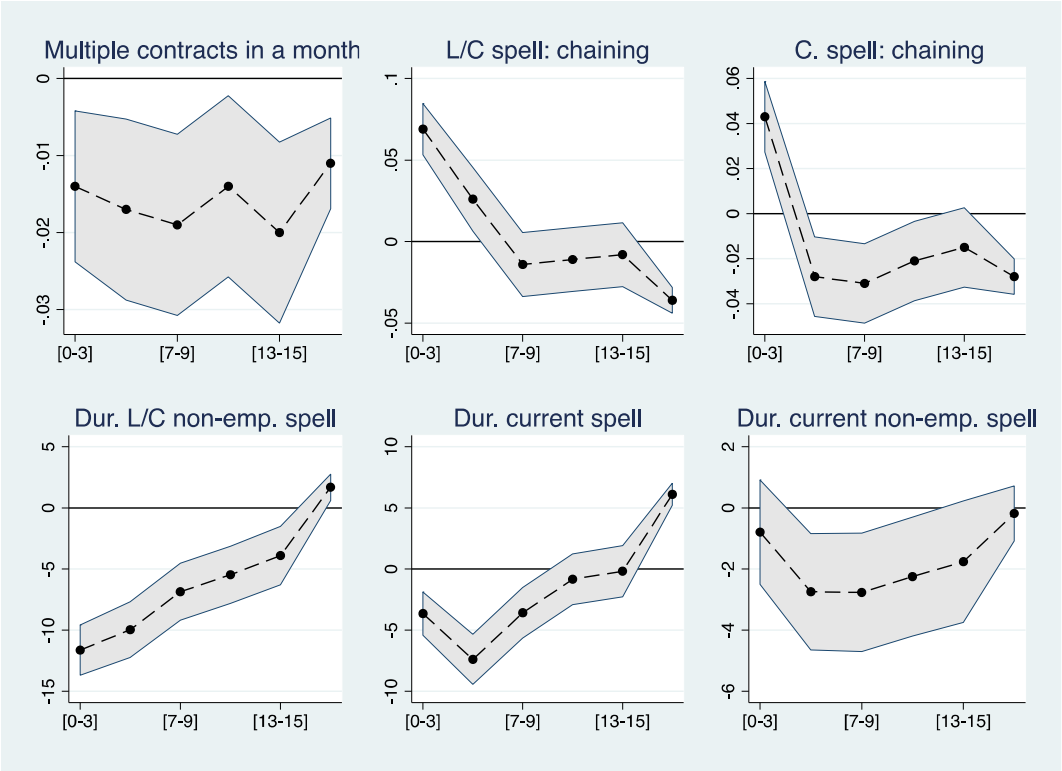
Note: Each point corresponds to the 2SLS estimates of γ^{ν} in equation (E.2) that represents the cost of a growth in family size in the period show in horizontal axis in comparison to those periods previous the increase of the family size. Solid line, mothers with just or less than compulsory education. Dashed line refers to mothers with more than compulsory education. The grey area represents the 95% confidence interval.

Figure 4: Dynamic impact of number of children on mother's traditional extensive and intensive margins. Sample 2+. Analysis by level of education of the mother.



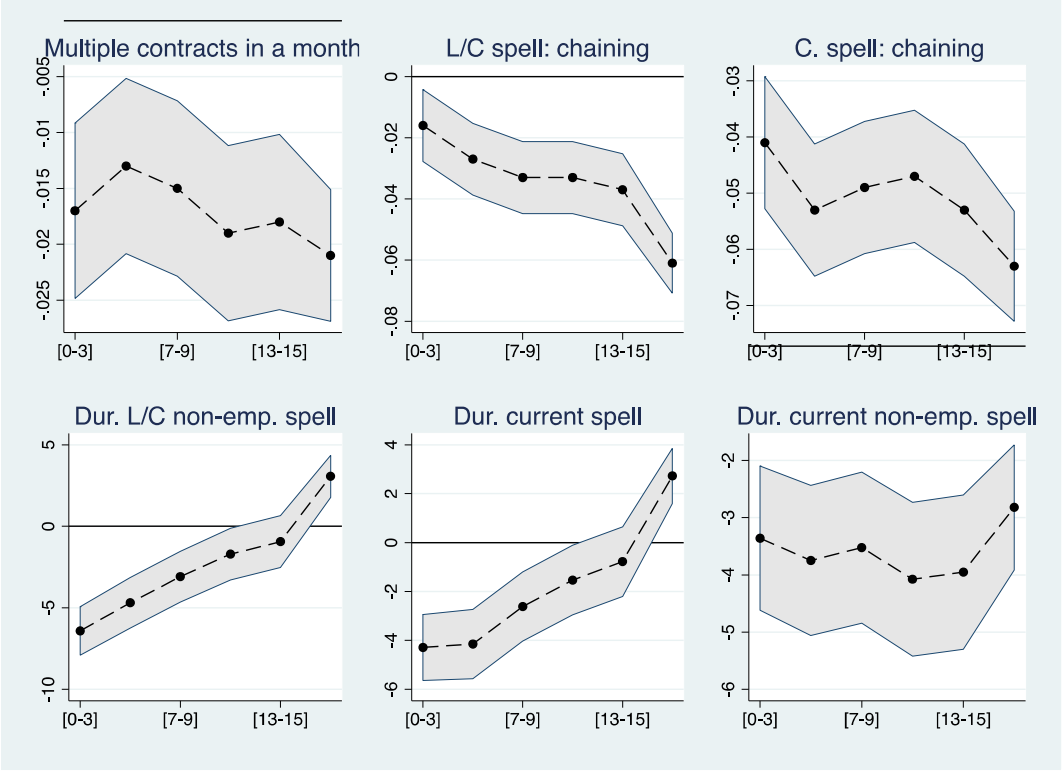
Note: Each point corresponds to the 2SLS estimates of γ'' in equation (E.2) that represents the cost of a growth in family size in the period show in horizontal axis in comparison to those periods previous the increase of the family size. Solid line, mothers with just or less than compulsory education. Dashed line refers to mothers with more than compulsory education. The grey area represents the 95% confidence interval.

Figure 5: Dynamic impact of number of children on mother's selected outcomes (second outcome group). Sample 1+.



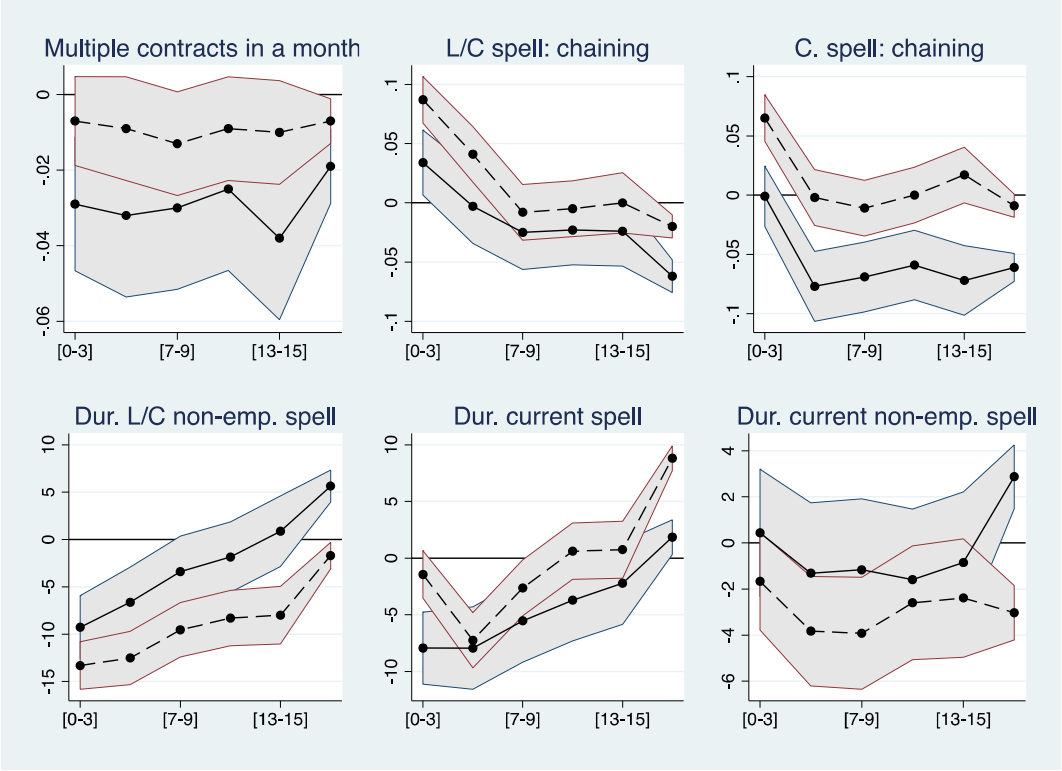
Note: Each point corresponds to the 2SLS estimates of γ^{v} in equation (E.2) that represents the cost of a growth in family size in the period show in horizontal axis in comparison to those periods previous the increase of the family size. The grey area represents the 95% confidence interval.

Figure 6: Dynamic impact of number of children on mother's selected outcomes (second outcome group). Sample 2+.



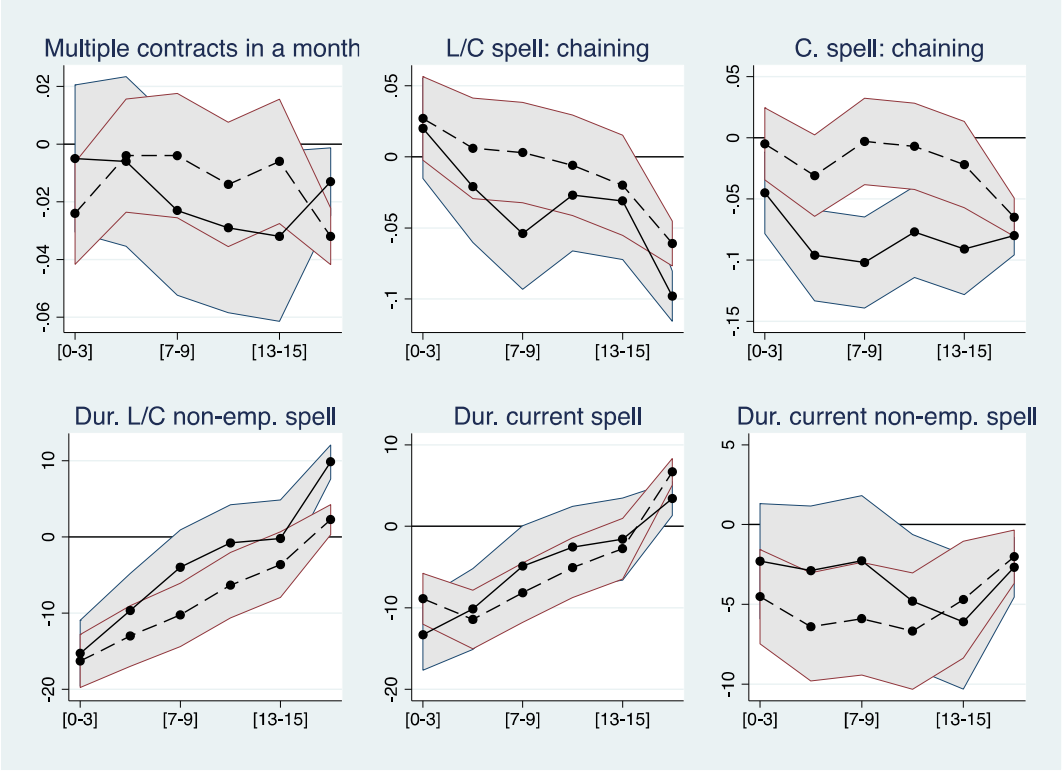
Note: Each point corresponds to the 2SLS estimates of γ^{w} in equation (E.2) that represents the cost of a growth in family size in the period show in horizontal axis in comparison to those periods previous the increase of the family size. The grey area represents the 95% confidence interval.

Figure 7: Dynamic impact of number of children on mother's selected outcomes (second outcome group). Sample 1+. Analysis by level of education of the mother.



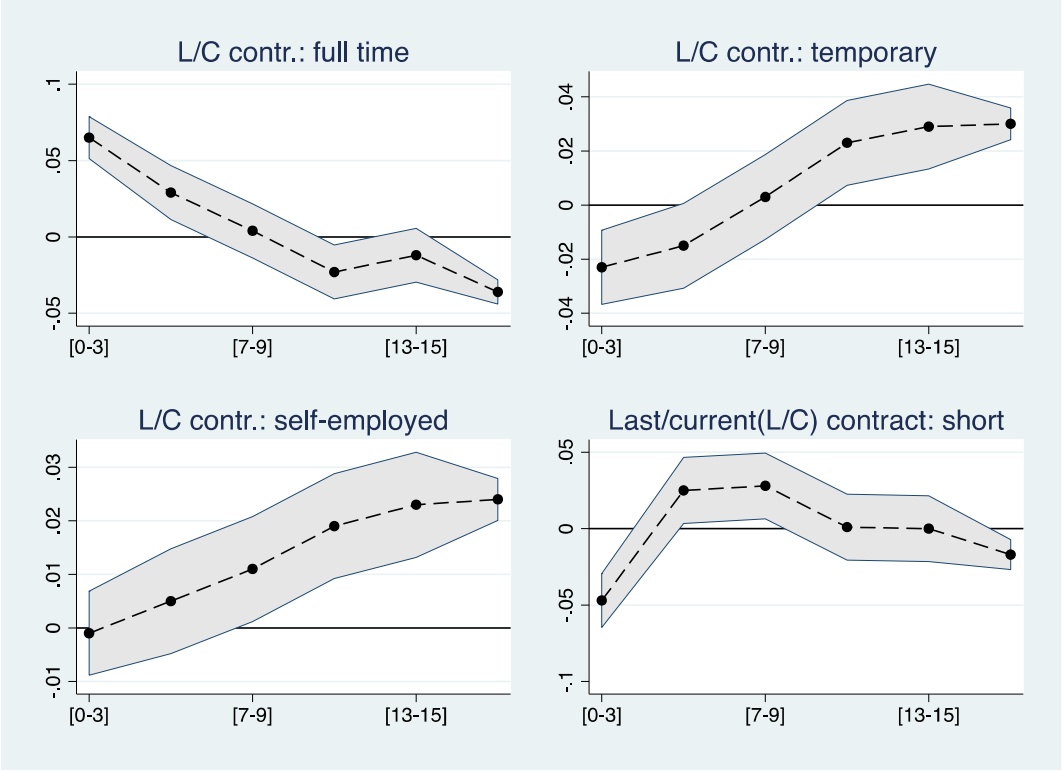
Note: Each point corresponds to the 2SLS estimates of γ^{v} in equation (E.2) that represents the cost of a growth in family size in the period show in horizontal axis in comparison to those periods previous the increase of the family size. Solid line, mothers with just or less than compulsory education. Dashed line refers to mothers with more than compulsory education. The grey area represents the 95% confidence interval.

Figure 8: Dynamic impact of number of children on Mother's selected outcomes (second outcome group). Sample 2+. Analysis by level of education of the mother.



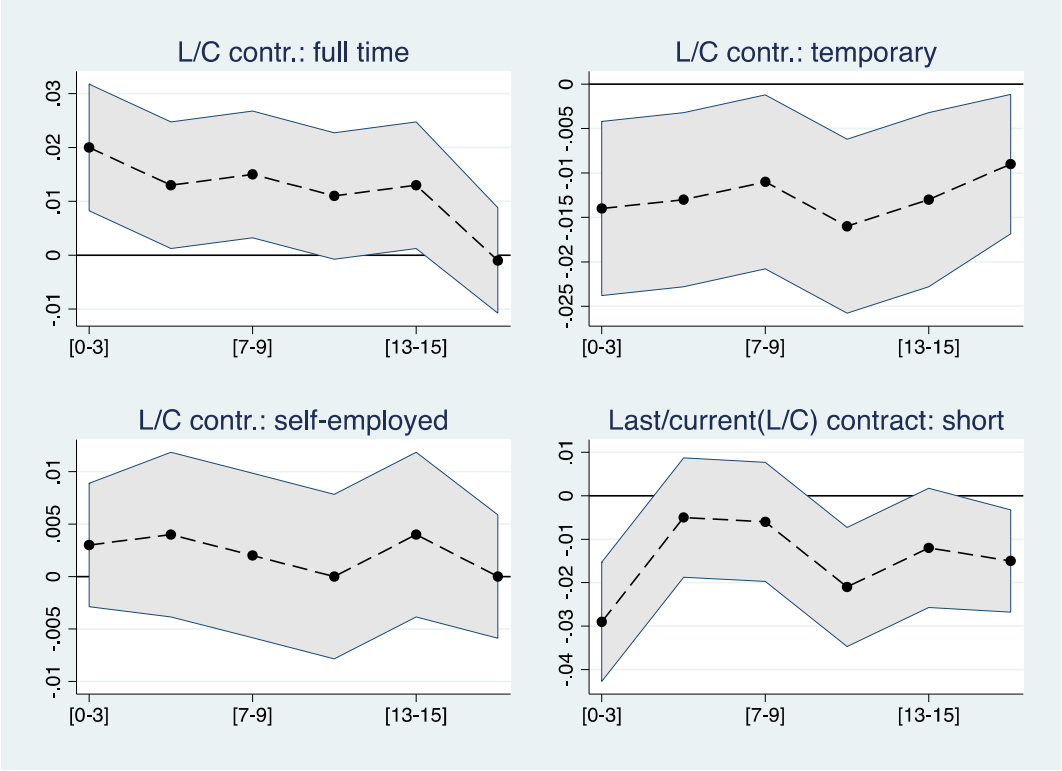
Note: Each point corresponds to the 2SLS estimates of γ^{v} in equation (E.2) that represents the cost of a growth in family size in the period show in horizontal axis in comparison to those periods previous the increase of the family size. Solid line, mothers with just or less than compulsory education. Dashed line refers to mothers with more than compulsory education. The grey area represents the 95% confidence interval.

Figure 9: Dynamic impact of number of children on mother's selected outcomes (second outcome group). Sample 1+.



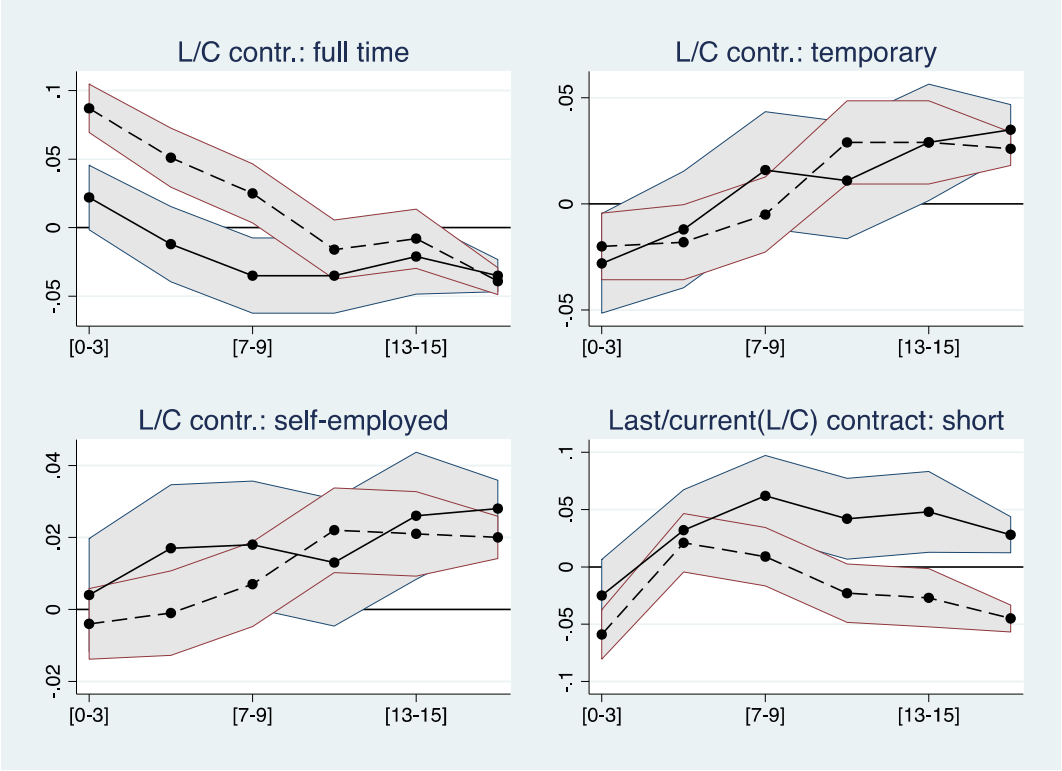
Note: Each point corresponds to the 2SLS estimates of γ^{w} in equation (E.2) that represents the cost of a growth in family size in the period show in horizontal axis in comparison to those periods previous the increase of the family size. The grey area represents the 95% confidence interval.

Figure 10: Dynamic impact of number of children on mother's selected outcomes (second outcome group). Sample 2+.



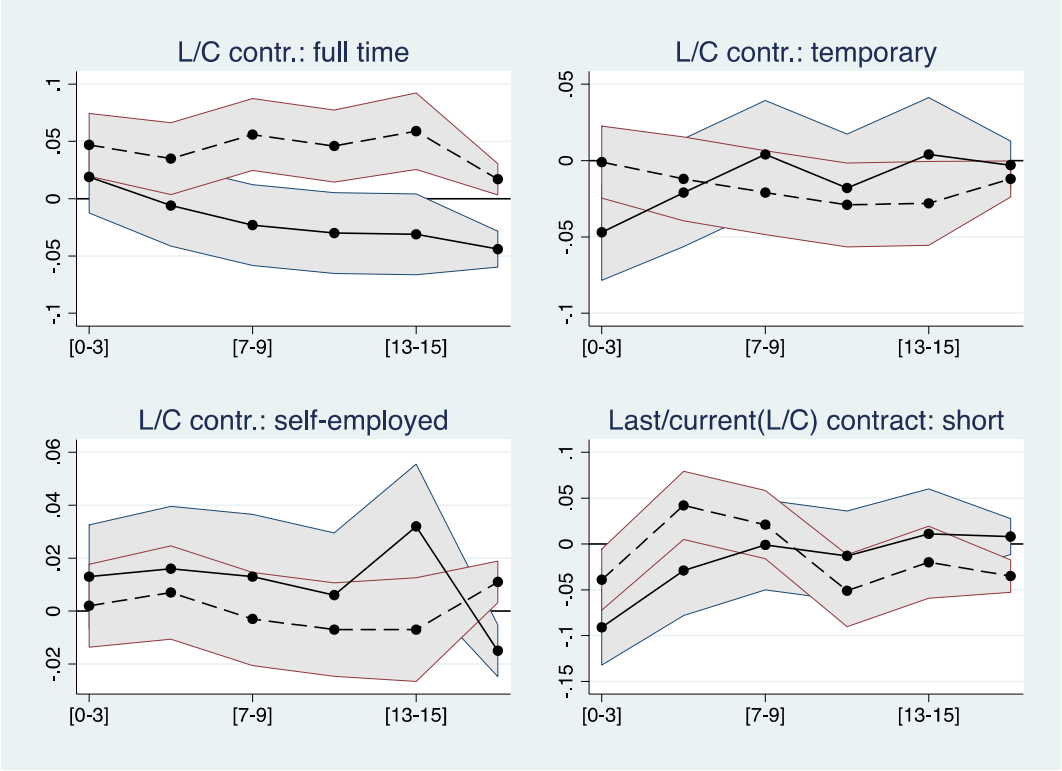
Note: Each point corresponds to the 2SLS estimates of γ^{v} in equation (E.2) that represents the cost of a growth in family size in the period show in horizontal axis in comparison to those periods previous the increase of the family size. The grey area represents the 95% confidence interval.

Figure 11: Dynamic impact of number of children on mother's selected outcomes (second outcome group). Sample 1+. Analysis by level of education of the mother.



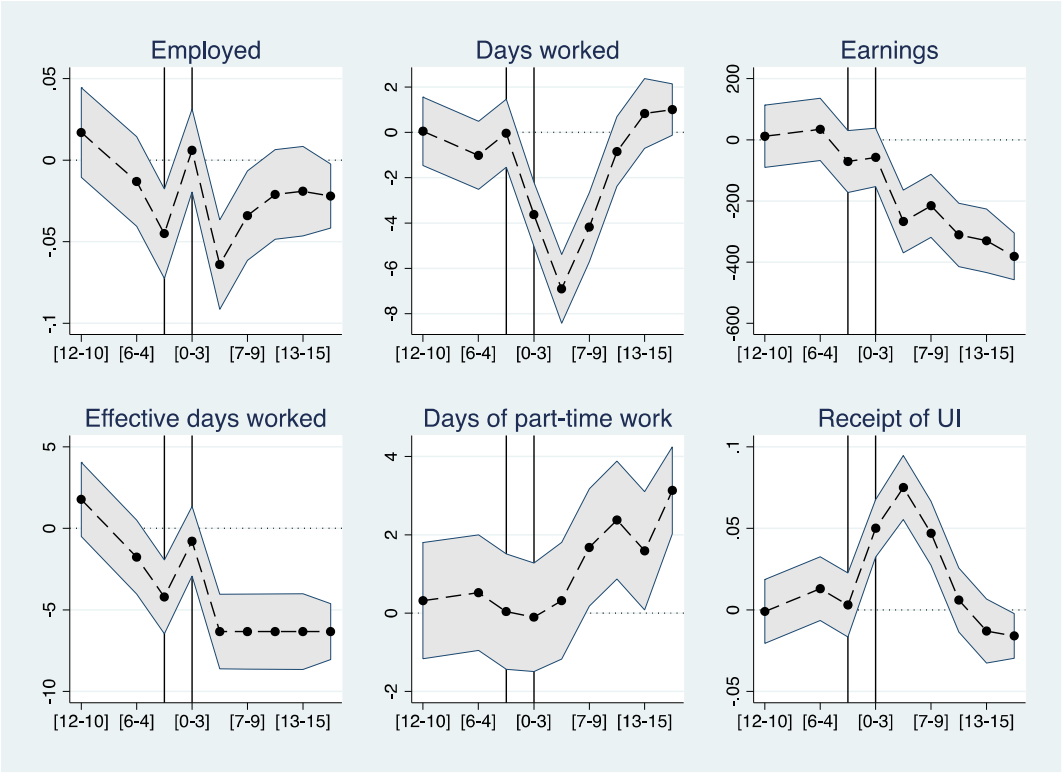
Note: Each point corresponds to the 2SLS estimates of γ^{v} in equation (E.2) that represents the cost of a growth in family size in the period show in horizontal axis in comparison to those periods previous the increase of the family size. Solid line, mothers with just or less than compulsory education. Dashed line refers to mothers with more than compulsory education. The grey area represents the 95% confidence interval.

Figure 12: Dynamic impact of number of children on mother's selected outcomes (second outcome group). Sample 2+. Analysis by level of education of the mother.



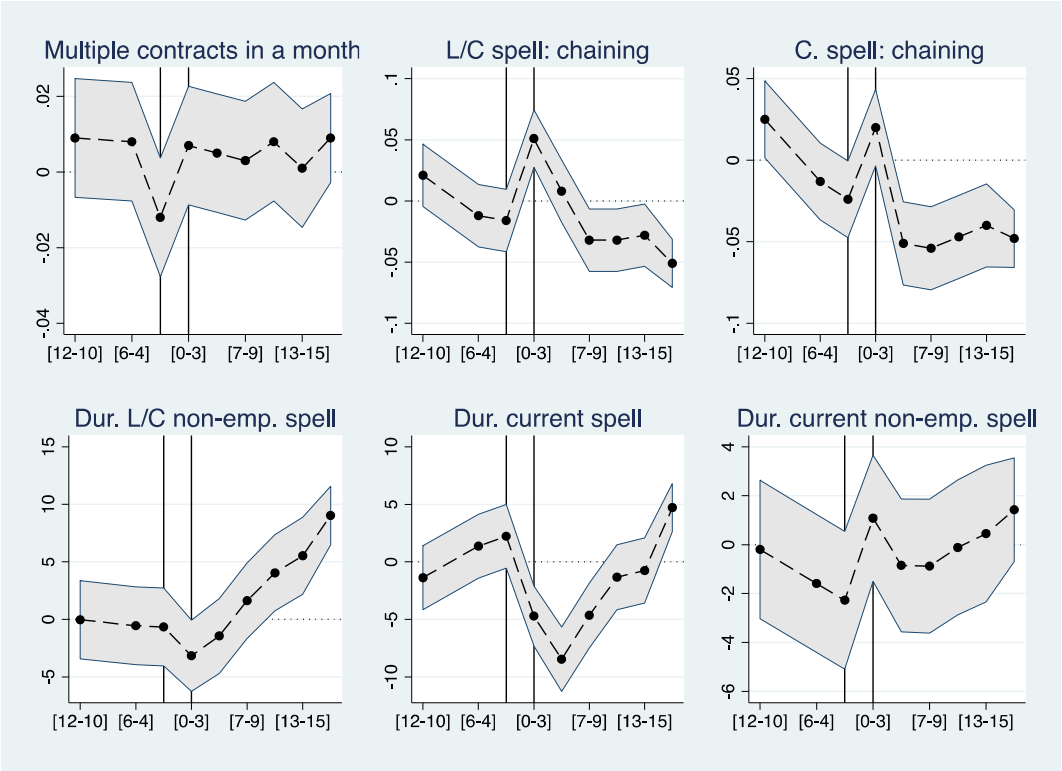
Note: Each point corresponds to the 2SLS estimates of γ^{v} in equation (E.2) that represents the cost of a growth in family size in the period show in horizontal axis in comparison to those periods previous the increase of the family size. Solid line, mothers with just or less than compulsory education. Dashed line refers to mothers with more than compulsory education. The grey area represents the 95% confidence interval.

Figure 13: Impact of multiple births on selected outcomes. Robustness check. Sample 1+.



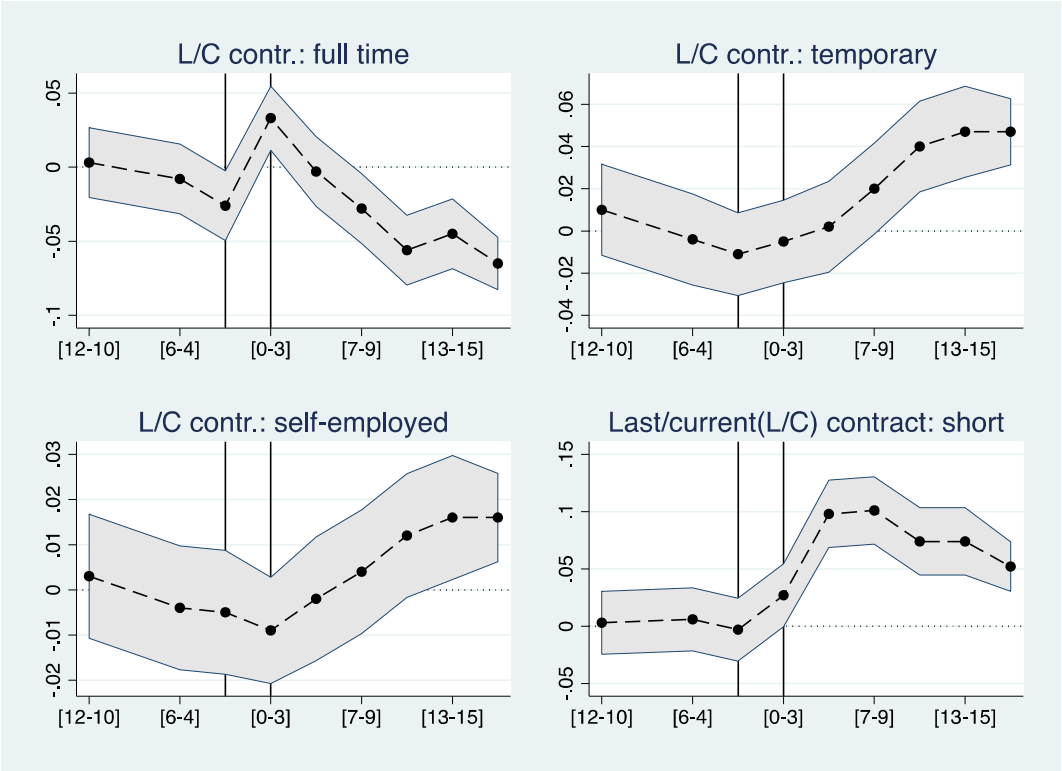
Note: Each point corresponds to the OLS estimates of the impact of multiple births on each of the outcomes using the specification in equation (E.2) but including a series of leads (placebo dummies). The first vertical line from left to right represents the approximately time of conception. The second line represents the time of birth. The grey area represents the 95% confidence interval.

Figure 14: Impact of multiple births on selected outcomes. Robustness check. Sample 1+.



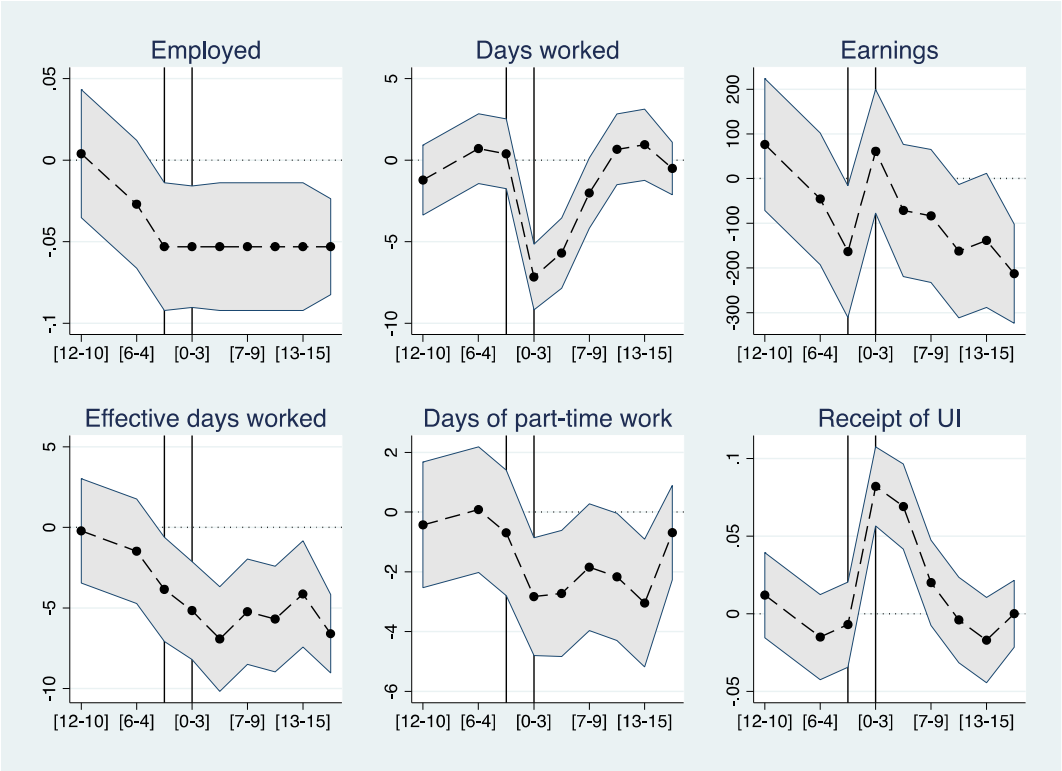
Note: Each point corresponds to the OLS estimates of the impact of multiple births on each of the outcomes using the specification in equation (E.2) but including a series of leads (placebo dummies). The first vertical line from left to right represents the approximately time of conception. The second line represents the time of birth. The grey area represents the 95% confidence interval.

Figure 15: Impact of multiple births on selected outcomes. Robustness check. Sample 1+.



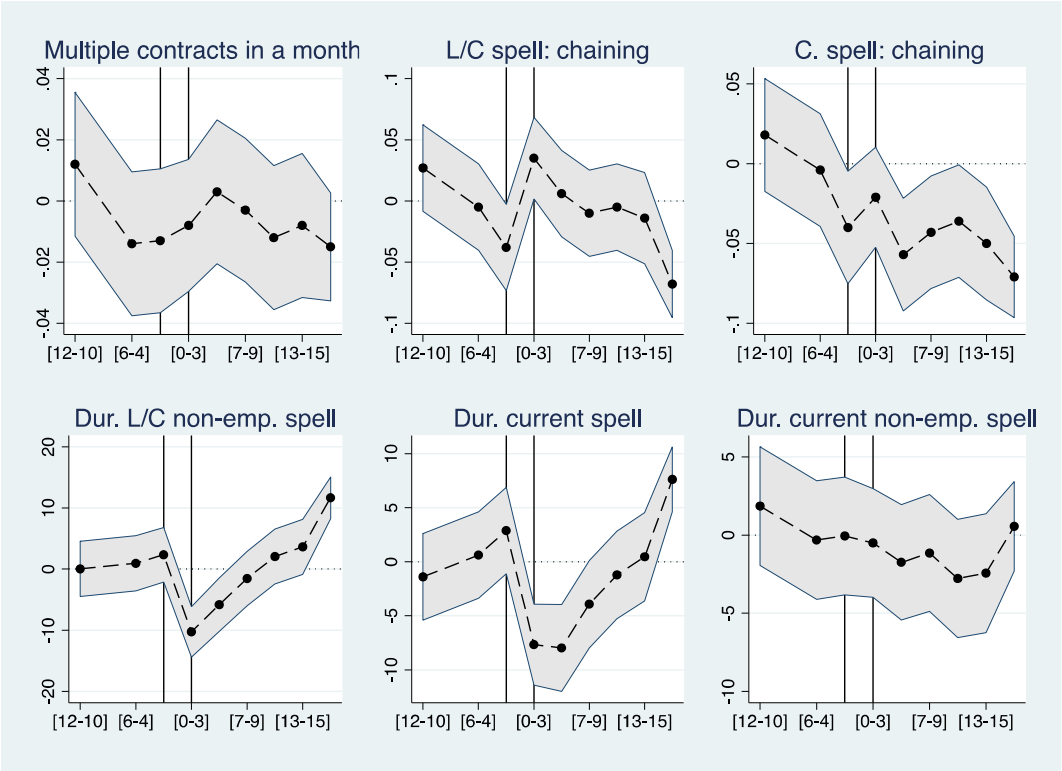
Note: Each point corresponds to the OLS estimates of the impact of multiple births on each of the outcomes using the specification in equation (E.2) but including a series of leads (placebo dummies). The first vertical line from left to right represents the approximately time of conception. The second line represents the time of birth. The grey area represents the 95% confidence interval.

Figure 16: Impact of multiple births on selected outcomes. Robustness check. Sample 2+.



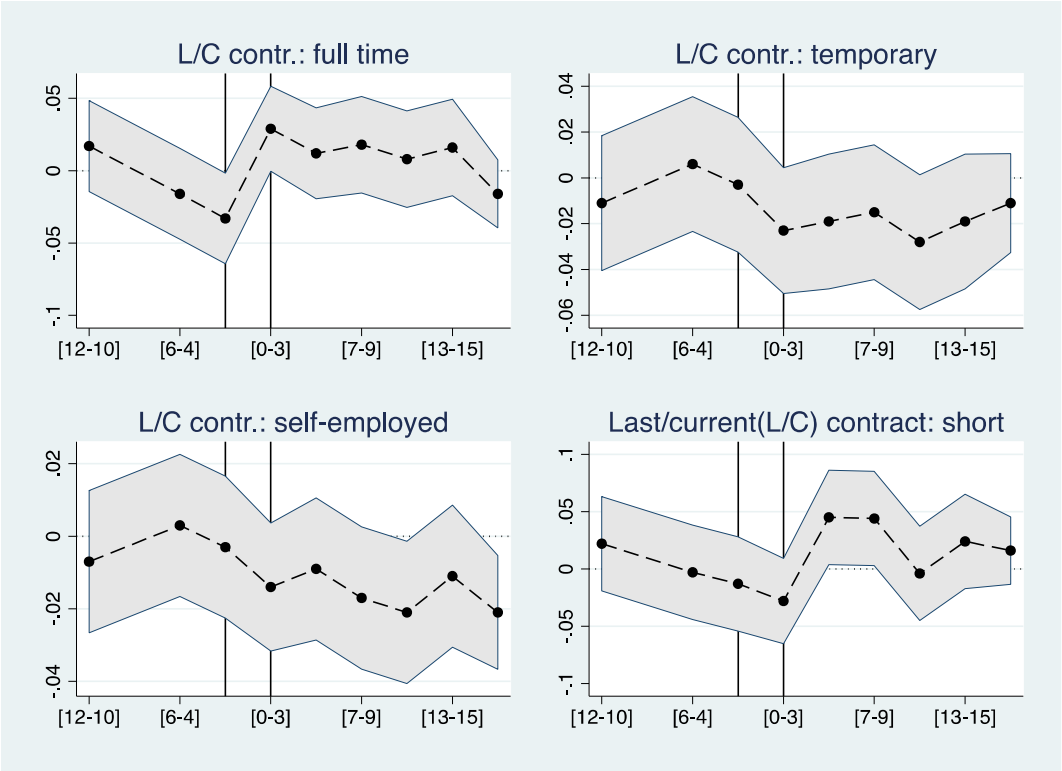
Note: Each point corresponds to the OLS estimates of the impact of multiple births on each of the outcomes using the specification in equation (E.2) but including a series of leads (placebo dummies). The first vertical line from left to right represents the approximately time of conception. The second line represents the time of birth. The grey area represents the 95% confidence interval.

Figure 17: Impact of multiple births on selected outcomes. Robustness check. Sample 2+.



Note: Each point corresponds to the OLS estimates of the impact of multiple births on each of the outcomes using the specification in equation (E.2) but including a series of leads (placebo dummies). The first vertical line from left to right represents the approximately time of conception. The second line represents the time of birth. The grey area represents the 95% confidence interval.

Figure 18: Impact of multiple births on selected outcomes. Robustness check. Sample 2+.



Note: Each point corresponds to the OLS estimates of the impact of multiple births on each of the outcomes using the specification in equation (E.2) but including a series of leads (placebo dummies). The first vertical line from left to right represents the approximately time of conception. The second line represents the time of birth. The grey area represents the 95% confidence interval.