

WOMEN'S EMPLOYMENT AND CHILDCARE CHOICES IN SPAIN THROUGH THE GREAT RECESSION

Nuria Legazpe^a and María A. Davia^b

ABSTRACT

The Great Recession (2008–13) changed patterns in women's employment and the use of formal and informal external childcare among mothers of young children in Spain. This paper analyzes these changes using an analytical strategy that takes into account interdependencies across the outcomes under study. The results show that the economic crisis has resulted in interesting changes in the use of external childcare across mothers' and fathers' employment status; for example, as men's unemployment increased, the use of informal non-parental childcare declined, which might be related to (unobserved) changes in fathers' involvement in childcare during the recession. These results further indicate the need for policies that improve access to formal childcare, as well as policies that provide men and women with employment stability.

KEYWORDS

Women's employment, childcare, economic cycle, structural models, tobit models, Spain

JEL Codes: J13, J16, J22

INTRODUCTION

Employment rates of women with dependent children are quite low in Spain and other southern European countries (Del Boca 2002), even despite the advances in recent decades. At the same time, fertility rates remain very low. This low-participation–low-fertility puzzle is said to be related to labor market institutions and to the rather scarce provision of public childcare and adult care (Bettio and Plantenga 2004). The gendered outcomes of the Great Recession have challenged this traditional model by severely affecting men's jobs while increasing the share of households where women are the main income providers. In Spain, the Great Recession meant an upsurge in men's unemployment of 18 percentage points between 2007 and 2012, an increase that induced an added-worker effect among women (Anghel, De la Rica, and Lacuesta 2014). This effect,

together with ulterior job losses in the service sectors, ended in a 15-percentage-point rise in women's unemployment over the same timespan. Still, the steady provision of places in preschool education prevented a shrinkage in the use of formal childcare during the Great Recession, while informal (most often, unpaid) care became less common.

This paper aims to contribute to the literature on mothers' labor participation and demand for non-parental childcare in Spain. To this end, it simultaneously analyzes mothers' paid working time and the time their children younger than three years old spend in formal and informal non-parental care over the period 2005–13. This allows for a comparison of the pre-recession (2005–7) with the recession period, split into two stages: early (2008–10) and mature (2011–3, when Spain registered its highest unemployment rate ever).

The paper contributes to the existing evidence in three ways. First, it considers the potential complementarity and substitutability between maternal employment and the demand for two non-mutually exclusive types of non-parental childcare. This is done via the structural equation approach, whose only precedent, to our knowledge, is Catia Nicodemo and Robert Waldmann (2009). The second is its use of the relevant information on childcare available in the Spanish Living Conditions Survey (SLCS). The dataset records the number of weekly hours every child in the household spends in different types of care or education. This is combined with information about income and other parental and household features, many of which are not available in time-use surveys, to cover the demand for non-parental care from an enriched angle. Our third contribution is the comparison of different stages of the economic cycle over the period 2005–13, which connects our research with the literature on the influence of macro-aggregates on intrahousehold allocation of time. We intend to indirectly test whether fathers' joblessness during the crisis may have contributed to reducing the need for informal non-parental childcare and discuss diverse theoretical approaches for and against this assertion. Our empirical strategy also intends to shed indirect light on this issue.

Our results confirm the prevalence of the usual drivers for the use of childcare services in Spain when the endogenous nature of mothers' employment status is taken into account. Consistent with most of the previous evidence, the amount of time mothers of young children devote to paid employment is found to be positively correlated with the demand for both formal and informal non-parental childcare, which are mutual substitutes. We also find an added worker effect at the beginning of the crisis and some hints of substitution of informal non-parental care by parental care in the context of reduced employment opportunities during the recession.

THE PROVISION OF FORMAL AND INFORMAL CHILDCARE
IN SPAIN

Spanish women have improved both educational achievements and labor force participation levels in recent decades. Still, the traditional model of the distribution of home production prevails, with women shouldering most of the burden of child- and adult care, which hinders their participation in the labor market (for a long-term view, see Cristina Carrasco and Arantxa Rodríguez [2000]). Public efforts to foster women's labor force participation include the introduction of a new education system (defined in the *Ley de Ordenación General del Sistema Educativo* [LOGSE; the Organic Act on the General Organization of the Education System]) in the early 1990s, which meant the extension of preschool to 3-year-old children. In order to fulfill it, the provision of public places in early education was considerably enlarged, resulting in nearly universal enrollment rates in 3–5-year-olds (Nollenberger and Rodríguez-Planas 2015).

As for children younger than 3 years old, there has been a steady increase in the share of publicly provided childcare centers over the last few decades. This expansion has not crowded out privately owned preschools (Nollenberger and Rodríguez-Planas 2015), many of which (the so-called *centros concertados*) are publicly funded and have rather affordable fees, which are comparable to public daycare centers.¹ Moreover, low-income families are usually subsidized and given priority access to public childcare centers. Consequently, the use of formal childcare is more constrained by the availability of places than by its price. It also comes hand in hand with better knowledge about the benefits of schooling at an early age and the extension of new family models and attitudes about raising children (González 2013).

Still, enrollment rates in preschool in children younger than 3 years old was 32 percent in the school year 2012–3, according to statistics from the Ministry of Education, Culture, and Sport (MECD; 2015). The substantial gap in enrollment rates between children in the 0–2 and 3–5 years age ranges points out the difficulties mothers of very young children have in participating in the labor market. The very limited use of (unpaid) parental leaves beyond the statutory (paid) ones, the low availability of high-quality part-time jobs, and extremely long and family-unfriendly working hours have played an important role in the demand for childcare in preschools, as time-use surveys reveal (Guner, Kaya, and Sánchez-Marcos 2014). Moreover, Spanish families with young children frequently need to use informal childcare arrangements, often provided by grandparents, for children younger than 3 years old. Their contribution to childcare runs parallel to mothers' labor force participation, the prevalence of dual-earner couples, and the increasing share of single-parent households (Meil and

Rogero-García 2015). Paid informal care is infrequent and linked to mid-high levels of family income (Carrasco and Rodríguez 2000); it became more common during the economic boom thanks to the availability of a migrant female workforce (Guner, Kaya, and Sánchez-Marcos 2014), which, together with the expansion of the provision of early childhood centers (Nollenberger and Rodríguez-Planas 2015), fueled mothers' labor market participation during the economic boom in Spain.

Rather than via income-tested cash benefits, economic support to families with young children mostly consists of income tax deductions from working mothers' income tax (100 euros per month per child).² In July 2007, a 2,500-euro birth grant was implemented.³ It was found to have a mildly positive impact on fertility rates but a negative one on mothers' labor force participation soon after childbirth (González 2013). The program came to an end in December 2010.

THEORETICAL APPROACHES TO MOTHERS' LABOR FORCE PARTICIPATION AND USE OF CHILDCARE

In the canonical economic approach to women's labor participation, the New Home Economics (Becker 1981), the intrahousehold distribution of working time in the market and in the household is explained by each partner's comparative advantages. This approach is gender-blind, favoring the gendered division of labor as one of its corollaries is that mothers bear most of the burden of childcare within the family. As a result, both costs and public and private provision of non-parental childcare are acknowledged determinants in mothers' labor participation decisions, but not in fathers'. Moreover, it ignores the fact that women's labor participation decisions are affected by endogenously determined intrahousehold interactions along with the allocation of time (Kaya Bahçe and Memiş 2013).

Alternative explanations of intrahousehold allocation of time entail relative bargaining power within the couple, as in Shoshana Grossbard's (2015) compensating differences framework around the core concept of Work-In-Household (WIH). WIH is defined as "an (unpaid) activity that has an opportunity cost and benefits also another household member who could potentially compensate the individual that produced WIH" (Bloemen and Stanca 2014: 53). Wages define each spouse's bargaining power to "buy" time for WIH – including childcare – from each other at an unobserved price that influences their labor supply decisions: each of them will compare his/her own WIH price with his/her expected market wage and will use his/her partner's WIH time price to estimate the amount of time he/she will need to devote to paid work in order to buy it (Grossbard 2015).

This vision of bargaining processes within the household is rather naïve for feminist scholars, who claim that the household allocation of time is

more complicated than the bargaining models describe. Intrahousehold decision-making rules are determined by the social context, social norms, ethical principles, patriarchal and gender-biased relations, institutions, regulations, laws, and policies (Berik and Kongar 2013).

Parental childcare at home may be supplemented with non-parental childcare provided by educational institutions and/or professional childminders. The analysis of the demand for non-parental childcare first came from the conventional consumer choice approach, which predicts mothers' demand for childcare services from their preferences, budgetary restrictions, and time constraints (see Chaudry, Henly, and Meyers [2010] for a thorough review). Preferences are related to educational attainment, with educated mothers being more aware of the benefits of preschool. Budgetary restrictions are defined by mothers' personal income from paid work and other sources (such as partners' income and family benefits), and time constraints depend on their employment status (García-Mainar, Molina, and Montuenga 2011). Under this approach, the demand for childcare is unrealistically assumed to contribute only to maximizing the mothers' utility concerning childcare, which in fact is not separate from the utility from labor force participation (Chaudry, Henly, and Meyers 2010). In order to acknowledge their mutual dependence, mothers' labor supply decisions (whether or not to work and, in that case, for how many hours) and demand for childcare are often modeled simultaneously (a prolific line of research stems from important work by Connelly [1992], followed by Ribar [1995]; Chiuri [2000]; Powell [2002]; Del Boca and Vuri [2007]; Tekin [2007]; and Van Gameren and Ooms [2009], among others).

Macroeconomic conditions also influence both the intrahousehold division of paid and unpaid work time and the demand for non-parental childcare. For instance, recessions exogenously increase the amount of time available for home production while decreasing household income. Their impact on consumption may be cushioned by substituting consumption of market products with home production, including childcare (Aguiar, Hurst, and Karabarbounis 2013; Morrill and Pabilonia 2015; Kongar and Price 2017). But the intrahousehold allocation of this additional working time for home production is ignored in most macroeconomic models (Berik and Kongar 2013). Moreover, when recessions disproportionately affect men's jobs, women may also enter the labor force or increase their paid work hours to compensate for men's unemployment (the well-known added worker effect). Feminist scholars warn that, as a result, recessions may mean more working time for women, both paid and unpaid. They may try to compensate for men's loss of relative economic power, increasing disparities between women's and men's workloads (Bittman et al. 2003). This is related to the so-called *doing gender* concept from sociology (Coltrane 2000), and its counterpart, *economic model of identity* (Akerlof and Kranton 2000), described in Almudena Sevilla-Sanz,

Jose Ignacio Gimenez-Nadal, and Cristina Fernández (2010): individuals internalize gender role expectations. When they are violated – for instance, because women earn more than their partners – one of the couple members loses identity (which is one dimension of utility) that will be restored with a more traditional gender division of housework driven by either partner (or both of them).

The demand for non-parental childcare implies the choice for the type of care according to parental preferences, relative prices, the number of children in the household, and constraints from the supply side. Highly educated parents tend to prefer formal childcare because they are aware of the benefits of socialization with other children and teachers (Mamolo, Coppola, and Di Cesare 2011). Relative market prices may provoke substitution of formal care for other types of care (Doiron and Kalb 2005). Formal care is preferable for only children as it helps them to socialize (Del Boca and Vuri 2007), while there may be economies of scale in the use of paid formal care for more than one child; this is not necessarily true with unpaid childcare, though, as relatives and friends may be less ready to volunteer for help with more than one child at a time. Finally, constraints from the supply side, defined by the availability of places in public and private preschool centers as well as informal help networks (nearby relatives and friends), are also relevant in determining the actual level of non-parental childcare use (Borra 2010).

EMPIRICAL EVIDENCE ON MOTHERS' EMPLOYMENT STATUS AND DEMAND FOR CHILDCARE

Research on the relationship between demand for childcare and women's labor market participation is mainly focused on the influence of childcare costs and availability (for an extensive review of the evidence for the US and other developed countries, see Taryn W. Morrissey [2017]). The elasticity of labor market participation to both drivers varies across types of childcare, across countries, and over time, along with trends in early care use, parental educational attainment, and labor force attachment. Other conditioning factors at the household level are children's age, household composition, and family income. In Spain, similarly to what is observed in the standard international literature, childcare costs have been found to decrease mothers' labor market participation (Borra 2010), whereas childcare availability (Baizán and González 2007; Suárez 2013) has the opposite effect.

Also in line with international evidence, macroeconomic conditions have an uneven impact on women's and men's time use (Gimenez-Nadal and Molina 2014): higher unemployment rates in 2009–10 (compared with 2002–3) were associated with a significant increase in time for home

production – though childcare was not explicitly observed – and less time for leisure in women only. The evidence produced in Jose Ignacio Gimenez-Nadal and Jose A. Molina (2014) is based on time-use surveys and is therefore related to some of the above-mentioned studies for the United States, namely, Mark Aguiar, Erik Hurst, and Loukas Karabarbounis (2013), Günseli Berik and Ebru Kongar (2013), Melinda S. Morrill and Sabrina W. Pabilonia (2015), and more recently, Ebru Kongar and Mark Price (2017). The evidence we provide in this piece of research holds both similarities and differences with them. It differs from them all since our dataset does not allow us to distinguish between different time uses for men and women (such as, housework, childcare, and leisure). We instead look at the correlation between different circumstances (such as the partner's labor market status) and mothers' time in paid work under different macroeconomic contexts. In the above-mentioned empirical studies, this is not always straightforward, and often the evidence obtained on time use for men and women does not refer to couples but to household informants of different genders. In Berik and Kongar (2013), Morrill and Pabilonia (2015), and Kongar and Price (2017), the impact of the recession on an individual's time use is given by its reaction to the within-state variation in unemployment rates relative to the other US states, whereas we identify it simply by splitting the sample into three sub-periods, as explained in the introduction. Similarly to these authors, we also aim to observe an added worker effect in mothers partnered to non-employed fathers in a more direct way than in the outlined pieces of work, from the observed spells of short- and long-term unemployment of the father instead of the general unemployment rate. In this sense, our strategy also allows for a more direct detection of added worker effects than in Seçil A. Kaya Bahçe and Emel Memiş (2013), where each partner's unemployment risk is first estimated and used as an extra explanatory variable in each other's time-use equations.

Unlike the analyses developed with time-use surveys, we do not observe parental time devoted to childcare at home. Instead, our study addresses the demand for non-parental childcare, which is not covered in the evidence drawn from time-use surveys and represents the flip side of the coin in childcare. Our inference of time spent with children at home from the estimation of the time children spend in formal and informal non-parental care is therefore far more indirect than in the above-mentioned pieces of research. Still, we expect to observe mothers devoting more time to paid work in the context of crisis and joblessness in their partners together with a reduced demand for non-parental care, in our understanding that it will be indirect evidence of fathers' potential involvement in childcare as a result of their own unemployment experience, that is, a reallocation of lost paid work time toward home production. Our results are expected to be different from those from Kaya

Bahçe and Memiş (2013), inasmuch as they analyze the Turkish context and find traditional patterns of behavior for both men and women, which in recessions are reinforced by *doing gender* dynamics, whereas we expect to find the effect of changes in economic bargaining power between spouses.

In recent decades, fathers tended to get more involved in childcare in Spain, particularly in dual-earner couples, but mothers still devoted more time to childcare than fathers (Meil and Rogero-García 2015). Fatherly care tends to substitute rather than supplement grandparental childcare and other means of reconciling family and work life (such as lunches at school or paid housekeeping at home). Their commitment to childcare, particularly to time-intensive, routine care, responds to mothers' working time schedules but not to their own working status (Gracia and Esping-Andersen 2015). It varies, though, across educational attainment: highly educated fathers devote more time to primary care – to attend to basic needs – regardless of their working status (Gutiérrez-Domènech 2010).

Most evidence on childcare choice and its influence on maternal employment in Spain focuses on children younger than 3 years old. For instance, Cristina Borra (2010) finds maternal labor force participation to be very elastic to changes in formal childcare costs, while, under a framework that considers costs, availability, and needs, Cristina Borra and Luis Palma (2009) find that childcare in day centers and babysitters are price substitutes; similarly, relative and parental care substitute day centers when the latter's price increases. Later on, María José Suárez (2013) studies the choice between paid (formal and informal) and unpaid childcare for working mothers via a sequential, multinomial approach. Despite our methodological differences, our results share common patterns with hers: parental education, family composition, income, and some of the mother's job features influence the choice of the type of childcare.

DATABASE AND SAMPLE

The data used in this article come from the SLCS, also called the Spanish Section of the European Union Survey on Income and Living Conditions, which covers information about socioeconomic and labor market features at both the household and the individual level (Atkinson and Marlier 2010). The cross-sectional files of the SLCS micro-data provide the number of weekly hours each child younger than 12 years old spends in different types of childcare and education arrangements, here clustered in two broad categories: formal and informal. Formal care refers to education at preschool, education at compulsory school, childcare at center-based services, and childcare at daycare centers; informal care comprises childcare by professional childminders – at the child's home or at the childminder's – grandparents, other household members (apart from parents), or other relatives, friends, or neighbors.

WOMEN'S EMPLOYMENT AND CHILDCARE CHOICES

Table 1 Mean values of dependent variables: Incidence and median hours per week

	Total	2005-7	2008-10	2011-3
A) Incidence (%)				
Paid work	57.96	53.67	60.31	60.91
Formal care^a	42.30	41.44	41.54	44.36
Preschool	40.20	37.88	40.28	43.23
Daycare center/Center-based	2.46	4.16	1.45	1.36
Informal care^a	21.70	25.47	21.83	16.46
Professional childminder	3.65	5.03	3.69	1.74
Relatives, friends	18.58	21.03	18.81	15.00
B) Median hours per week when the number of hours > 0				
Paid work	34.46	34.46	34.28	34.67
Formal care	26.37	25.56	27.16	26.49
Preschool	26.38	25.46	27.28	26.46
Daycare center / Center-based	22.35	22.78	20.38	23.07
Informal care	24.21	22.65	25.48	25.44
Professional childminder	24.61	23.47	26.44	24.41
Relatives, friends	23.44	21.81	24.39	25.08
Number of mothers/households	6,387	2,435	2,152	1,800
Number of observations (children-mothers)	7,535	2,862	2,547	2,126

Notes: ^aSince children may receive several types of formal or informal childcare, the shares of observations in the different types do not add up to the share of children receiving formal/informal care.

Source: Spanish Living Conditions Survey (SLCS), cross-sectional files 2005-2013, Spanish Statistical Institute (INE 2016).

We explore nine waves of the SLCS (2005-13). Since our interest very much lies in the evolution in the demand for childcare and mothers' paid employment throughout the Great Recession, we distinguish the pre-crisis period (2005-7), the early years of the crisis (2008-10), and the late phase of the recession (2011-3). Following most of the above-mentioned evidence for Spain, the sample is made up of children younger than 3 years old whose personal information is matched to their mother's and household's questionnaires.⁴ After dropping observations with missing values in explanatory variables, the selected sample is made up of 9,046 children from 7,558 Spanish-born mothers, representing a bit more than one million children per year in the population.⁵

The evolution of the dependent variables – maternal weekly working hours and young children's time in formal and informal care – over the observation period is displayed in Table 1: the upper part describes the incidence of the three dependent variables (share of observations where they hold positive values), while the lower part registers the median number of weekly hours in each activity if greater than 0. In consistency

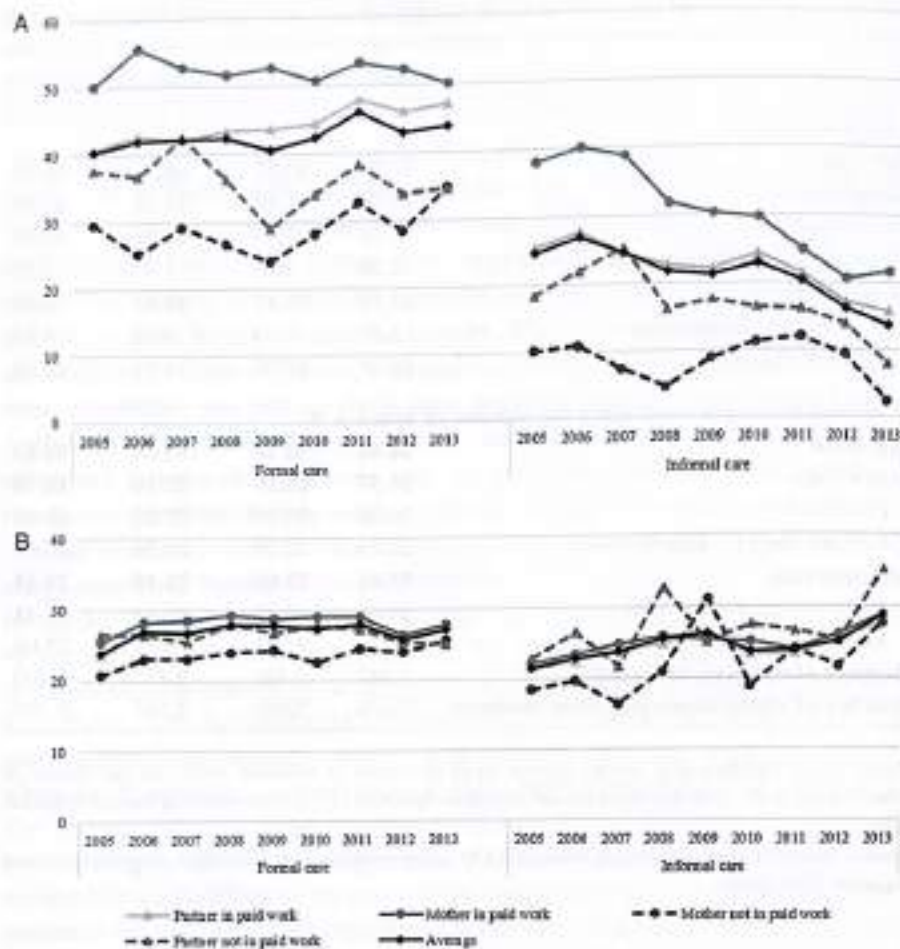


Figure 1A Children receiving formal and informal care, by parents' employment status; Figure 1B Median number of hours per week in formal and informal care (only those who spend at least 1 hour), by parents' employment status.
Source: Spanish Living Conditions Survey (SLCS), cross-sectional files 2005–13, Spanish Statistical Institute (INE 2016).

with the added worker effect phenomenon in Spain during the economic crisis (Anghel, De la Rica, and Lacuesta 2014), mothers' employment rate increased from 53.7 to 60.3 percent. Over the observation period, the share of children in formal care slightly increased, while the share of those in informal care noticeably decreased. Most formal care took place in preschools and most informal care was unpaid, provided by relatives or friends. No relevant changes were observed in either the number of hours mothers devote to paid employment or the number of hours children spend in non-parental care or education arrangements, formal or informal. The latter – around 25–27 weekly hours – coincides with the standard length of the (pre-) school week.

Figure 1A shows the evolution in the incidence of formal and informal childcare over the observation period across parental labor market statuses. The use of formal childcare seems quite correlated with mothers' employment status. The gap in the use of formal childcare by employed and non-employed mothers (30 percentage points in 2006) halved over the period, as the latter increased while the former remained relatively stable. The incidence of formal care is also correlated with fathers' employment status, but to a lower extent than it is to mothers'.⁶ Before 2008, the gap in formal care between children of jobless and working fathers was negligible; in 2009 it reached 15 percentage points, and from 2010 it has remained around 10–12 percentage points. The latter may respond either to an income effect or to a larger involvement of jobless fathers in childcare at home.

There was a steady and considerable decrease in the use of informal care throughout the observation period. Although its incidence depends much more on the mothers' than on the fathers' labor market status, the gap in the demand for informal care by working and non-working mothers halved from 30 to 15 percentage points over the period, with the sharpest drop from 2008 to 2012. Figure 1B shows that the number of hours in formal care is nearly orthogonal to parental labor force status (and only significantly below the average when the mother is out of work). While its incidence diminished, the number of hours in informal care increased from 2011 in children of non-employed parents, precisely the group with the lowest incidence.

METHODOLOGY AND RESULTS

Methodology and main hypotheses

Our empirical strategy, a system of *tobit* models, accommodates the distribution of the three dependent variables, censored at zero. Moreover, as in Kaya Bahçe and Memiş (2013), we account for potential endogeneity across the variables by performing a simultaneous – *trivariate* – estimation. The technical details are displayed in the Appendix.

From the theoretical frameworks discussed and the existing empirical evidence, the specifications of the sub-period specific models share a set of explanatory variables at both the individual and household levels, which are expected to be correlated with the variables of interest in the following ways:

- (a) Mothers' age and educational attainment are expected to go hand in hand with both paid work and demand for non-parental childcare. Highly educated mothers have higher incentives to participate in the labor market (Nicodemo and Waldmann 2009), and can better

value the services provided by regulated childcare settings (Del Boca, Locatelli, and Vuri 2005), which explains their preference for formal over informal childcare (Viitanen [2005], among many others).

- (b) Children's age and number of siblings in different age ranges: As children grow up, mothers will progressively return to the labor force and demand non-parental care. Having two or more children will discourage mothers' labor force participation. The preferred type of childcare when there are children of different age ranges is unclear *a priori*; it will depend on whether they can be accommodated with the same care provider to take advantage of economies of scale in childcare.
- (c) We have estimated a (net, hourly) shadow wage for all women in the sample via a standard Mincerian equation, considering the mother's number of years in formal schooling (since she was 6 years old), her reported work experience, and a proxy for tenure in the job. The latter is a categorical variable indicating whether, over the year prior to the interview, the woman moved into her current job from non-employment, from a different employer, or just remained in the same job. Their predicted values have been included in the three equations of the system as a proxy for the price of mothers' time. Women with a higher predicted wage are expected to be more prone to working effectively in the labor market and demand more non-parental care, particularly the formal type, as most informal care is freely provided by relatives or friends.
- (d) Disposable household income (excluding/discounting mothers' labor market earnings) by equivalent person (in 2005 prices) is expected to be negatively correlated with mothers' labor force participation while positively correlated with the demand for non-parental care, particularly the formal type, for the above-mentioned reasons.
- (e) The reception of child/family benefits in the household is meant to be a proxy for the institutional help provided to families, and therefore will be positively correlated with the demand for non-parental care, particularly formal care. Moreover, since they are usually aimed to incentivize mothers' labor market participation, they will also be positively correlated with mothers' time in paid employment.⁷
- (f) Mother's co-resident partner and his labor force status: Non-partnered mothers are expected to be employed and to demand non-parental care more intensively than their partnered counterparts.⁸ Added worker effects amongst women whose partners recently became unemployed are also expected. The reaction of the demand for non-parental care to partners' joblessness is not clear *a priori*, though. We expect attitudes and behavior of both members of the

couple to change as the crisis endures or as the unemployment period continues. Namely, during the early stages of the economic crisis or during the first months of unemployment, fathers may reassign the lost working time to job searching or other activities (education/training, leisure, self-care) different from childcare. Moreover, following the *doing gender* and *economics of identity* approaches discussed above (Akerlof and Kranton 2000; Coltrane 2000), we also expect initial responses to fathers' unemployment to be minimal because adherence to traditional gender roles could help to boost the confidence of unemployed men and encourage their job search. If, however, fathers' unemployment and household income deterioration persist, fathers' intrahousehold bargaining power will decrease and they may eventually become more involved in childcare over time while mothers devote more time to paid work to make up for the loss of income (Grossbard 2015). Regardless of how the load of the extra childcare time is distributed among partners, when the father is out of paid work, there will be a reduction in the demand for non-parental – particularly, informal – childcare.

- (g) Finally, some context variables (NUTS1, degree of urbanization and year of observation) aim to serve as proxies of job prospects, availability of both formal and informal care networks, and the macroeconomic conditions, respectively.

The level of significance and the sign of the correlation across the errors in the three equations (see the Appendix) will reflect the correlation between mothers' paid employment and the use of non-parental childcare, both formal (consistently with Connelly and Kimmel [2003]) and informal (Borra and Palma 2009) – not accounted for in explanatory variables, as explained in Kaya Bahçe and Memiş (2013). Formal and informal non-parental care are mutual substitutes (negative correlation across error terms). The size of the correlations may diminish in the recession if non-parental childcare is substituted by parental childcare at home.

The mean values of the explanatory variables are displayed in the Supplemental Online Appendix (Table B1): the 3-year-olds gain relative weight in the sample by 2011–3, while babies younger than 1 year old lose it, in line with the evolution of birth rates amongst Spanish mothers over the observation period (from 10.1 per thousand in 2008 to 8.3 in 2013). Nearly half of the children in the sample have no siblings. Mothers' average educational attainment noticeably increases over the period, with the share of university graduates climbing from 46.5 to nearly 52 percent. Their employment rate increased by 6 percentage points in the first stage of the crisis (2008–10) and remained stable during the late stage (2011–3).

Nearly 6 percent of the children in the sample live with single mothers. The share of children living with short-term unemployed fathers increased from 2005–7 to 2008–10; later on, as the crisis endured, there was an upsurge in the share of children with long-term unemployed or inactive fathers in 2011–3. In the meantime, the share of employed fathers decreased by 5 and 6 percentage points in the first and second stages of the crisis, respectively.

Around one-third of children lived in households receiving family/child allowances the year prior to the interview (the reference year for all income variables). The higher levels of receipt of those benefits during the 2008–10 sub-period may be explained by the implementation of the above-mentioned birth grants between July 2007 and December 2010. Finally, nearly half of the observations correspond to families living in densely populated areas.

Results

The results of the sub-period-specific multivariate analyses for the variables for which hypotheses were set in the previous sub-section are displayed in Table 2 (see the ones for the rest of the covariates in the Supplemental Online Appendix [Table B2]). Instead of coefficients, marginal effects are shown to better appreciate the size of the partial correlation between the explanatory and the dependent variables. They represent the variation in hours of maternal paid work and in demand for formal and informal childcare as the explanatory variables increase by one unit.¹⁰

The main findings may be summarized as follows:

- (a) As mothers age, they are more likely to be in paid work and to demand formal care, while less likely to demand informal care. However, in 2011–3, maternal age is orthogonal to informal care use, in line with the evolution of maternal income and the number of children over the maternal life cycle. In line with Nicodemo and Waldmann (2009), mothers' educational attainment is usually connected with the choice of formal over informal care. Before the crisis, highly educated mothers' employment rates were boosted by paid informal childminders, which may explain the odd positive marginal effect on the informal care, but from 2008 onwards, the preference for formal care prevails. In the first stage of the crisis, massive job losses caused a reduction in the returns to education in terms of employment probabilities, partially regained in the second stage of the recession.
- (b) As children grow, they progressively attend preschool or other types of formal care and there is a consequent/parallel increase in mothers' number of hours in paid work. Concerning the number

Table 2 Continued.

	Specification 1 (2003-7)			Specification 2 (2008-10)			Specification 3 (2011-3)		
	Paid work	Formal care	Informal care	Paid work	Formal care	Informal care	Paid work	Formal care	Informal care
The child has siblings (ref. Only child)	Younger than 4 years old only	-2.83*** (0.021)	0.386*** (0.017)	-1.71*** (0.018)	1.37*** (0.019)	-2.64*** (0.021)	-2.47*** (0.175)	1.94*** (0.067)	-0.578*** (0.017)
	Older than 3 years old only	-2.05*** (0.015)	-0.440*** (0.011)	-1.03*** (0.013)	-1.93*** (0.053)	-0.838*** (0.017)	-3.21*** (0.035)	1.16*** (0.062)	-0.651*** (0.088)
	Younger than 4 and older than 3	-3.18*** (0.033)	-0.348*** (0.027)	-1.09*** (0.031)	-4.36*** (0.039)	-1.31*** (0.036)	-6.30*** (0.474)	-1.45*** (0.037)	-4.87*** (0.145)
Mother's partner's employment status (ref. Employed)	Short-term unemployed	-0.65*** (0.040)	-0.341*** (0.031)	-3.55*** (0.031)	0.154*** (0.039)	-1.91*** (0.037)	-1.98*** (0.095)	-0.693*** (0.063)	-0.032*** (0.001)
	Long-term unemployed	3.12*** (0.080)	-0.288*** (0.055)	2.41*** (0.068)	-2.37*** (0.061)	-1.44*** (0.041)	-1.99*** (0.396)	-1.47*** (0.151)	-3.17*** (0.039)
	No partner present in the household	3.97*** (0.080)	3.23*** (0.055)	0.133*** (0.068)	-0.020 (0.061)	1.290*** (0.041)	-1.765*** (0.396)	1.72*** (0.151)	0.574*** (0.039)

(Continued).

Table 2 Continued.

	Specification 1 (2005-07)		Specification 2 (2008-10)		Specification 3 (2011-13)	
	Paid work	Informal care	Paid work	Informal care	Paid work	Informal care
HH disposable income net of mother's labor income	(0.036) Thousand euros - 0.035*** p.c.p. (2005 prices)	(0.027) 0.036*** 0.072***	(0.095) 0.012*** - 0.002**	(0.028) - 0.008***	(0.143) - 0.065***	(0.019) 0.011
Family/Children-related allowances (ref. Yes)	(0.001) 4.48*** (0.017)	(0.001) 1.26*** (0.012)	(0.001) 3.51*** (0.019)	(0.001) 1.95*** (0.012)	(0.002) 4.88*** (0.410)	(0.008) 3.70*** (0.134)
Predicted wage	(0.005) 2.33*** Euros/hour (2005 prices)	(0.004) 0.593*** 0.241***	(0.033) 2.25***	(0.006) 0.659*** 0.442***	(0.124) 1.49***	(0.038) 0.193***
Number of mothers/households		2,435		2,152		1,800
Number of observations (children-mothers)		2,862		2,547		2,126

Notes: ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Source: Spanish Living Conditions Survey (SLCS), cross-sectional files 2005-13, Spanish Statistical Institute (INE 2016).

of siblings and their ages, mothers' labor market participation is much lower when there are two or more children in the household, particularly if they are of different age groups. Formal care is preferred over informal in households where all the children are younger than 3 years old or there is just one child under 3 years old with elder siblings. This is consistent with the potential economies of scale from sending them to the same center. Only children are more likely to be in formal care than children with siblings, as finding informal (usually unpaid) caregivers for more than one child is very difficult.

- (c) The mothers' computed shadow wage – that is, the mothers' price of time – is positively correlated with time in paid work and the demand for both types of non-parental childcare throughout the observation period.
- (d) Household income (excluding mothers' labor market earnings) is negatively correlated with mothers' time in paid employment, with an odd reversion in 2008–10, though. At that time, family benefits considerably changed in amount, distribution, and nature with the implementation of the universal birth grant, temporarily changing mothers' reaction to its receipt. Both household income and the receipt of family benefits are positively correlated with the use of both informal and formal care, save for the above-mentioned reversion in the period 2008–10. Despite being statistically significant, the size of the average marginal effect is absolutely negligible in that period.
- (e) Compared with those partnered with employed men, non-partnered mothers were more likely to work than their partnered counterparts only in the pre-crisis period. They were also more likely to demand formal and even informal childcare than partnered mothers (save in 2008–10).

The correlation between mothers' time in paid work and their partner's employment status varies throughout the economic cycle: some indication of an added worker effect is found in 2008–10 – the first stage of the economic crisis – with women with short-term unemployed partners more likely to work than those partnered with employed men. Later on, when the economic crisis extended to service activities, seriously affecting many women's jobs as well as men's, it turned out that women partnered with jobless men were more likely to be out of employment (or work fewer hours) themselves, pointing to a polarization of the households' attachment to the labor market between dual earners and jobless couples.

Fathers' joblessness is negatively correlated with the use of both formal and, particularly, informal care (save in 2005–7). The lower demand

for formal care may point to lower household income, while the lower demand for informal care may result from fathers' reallocating lost paid working time with childcare at home, which usually substitutes informal non-parental care. Although we cannot disentangle to what extent jobless fathers engage in childcare at home, the evolution of marginal effects across fathers' job statuses over time may give some hints. In the pre-crisis period, children of short-term unemployed fathers received less informal care than children of employed fathers, while their mothers devoted the same amount of time as before to the labor market. In the first stage of the crisis, children of short-term unemployed fathers spent, again, less time on non-parental informal care than children of employed fathers, while their mothers devoted more time to paid employment, in line with the above-mentioned added worker effect and evidence for Spain (Anghel, De la Rica, and Lacuesta 2014) and the US (Berik and Kongar 2013). At that time, children of long-term unemployed or inactive fathers spent much less time in informal childcare, while their mothers' time in paid employment was only somewhat lower than time spent in paid employment by mothers with employed partners. In the late stage of the crisis, when unemployment reached peak levels in both men and women, the polarization in labor market participation in couples becomes clearer with mothers partnered to jobless men working fewer hours themselves. Again, the reduction in each child's time in informal care is more intensive than the reduction in the length of the mothers' working week. Many of the formerly short-term unemployed fathers became long-term unemployed or inactive in 2011–3. If they had previously contributed to childcare at home, they may well have continued to do so later on. They are also expected to lose bargaining power with time, which would eventually also explain their engagement in childcare. These results are to some degree similar to those obtained in Aguiar, Hurst, and Karabarbounis (2013).

There are also relevant and illustrative/explanatory changes in the size of the correlations across errors that measure the relevance of unobserved factors driving both maternal labor force and childcare use decisions throughout the economic cycle (see the Appendix). Namely, the significance of the estimated ρ_{12} , ρ_{13} , and ρ_{23} , that is, the pairwise correlations of the error terms across the three equations, confirms that the *trivariate tobit* is a more efficient solution than tackling the three outcomes separately. Their respective signs confirm that unobserved variables influence both mothers' time in paid work and the time children spend in non-parental care, both formal and informal in the same direction (positive ρ_{12} and ρ_{13}), as they are complementary decisions, while the opposite holds true across types of non-parental childcare (negative ρ_{23}), since they are mutual substitutes. The size of the correlation between errors over mothers' time in paid employment and children's time in formal care (ρ_{12}) equations decreases over time, maybe because of the steady levels of

public provision for formal childcare and early education throughout the observation period, which enabled sustained and even increasing levels of demand for formal childcare among non-employed mothers. Alternatively, as the economic situation worsens, fathers' involvement in childcare at home may substitute some formal childcare, reducing the strength of the unobserved forces that drive both maternal employment and formal childcare use. This is, however, not always the case, as formal childcare is often free or subsidized in Spain. The correlation between mothers' time in paid employment and children's time in informal care (ρ_{13}) decreases in the first stage of the crisis and partially reverses afterwards. This might be related to non-employed partners' higher involvement in childcare during the Great Recession, particularly in its first stage, while in the second stage both mothers and fathers had fewer paid working hours and more time available for childcare. Consequently, the influence of unobserved variables that explain the negative correlation between formal and informal care use (ρ_{23}) is a bit more pronounced in the first stage of the crisis and loses relevance during the second stage.

CONCLUSIONS

This paper has contributed to the literature on the relationship between mothers' participation in paid work and the use of non-parental childcare. We simultaneously analyze Spanish mothers' working time and the number of hours their children younger than 3 years old spend in formal and informal non-parental care over the period 2005–13. Our empirical strategy allows us to consider potential complementarity and substitutability between the outcomes under study, while taking their truncated nature into account.

The dataset at hand (SLCS) provides information about parental time in paid work and children's time in two non-mutually-exclusive types of care, from which potential relationships may be inferred. Still, neither the time children spend under parental care at home nor the distribution of parental time devoted to childcare between both parents is registered. What are in our opinion the reasonable above-mentioned speculations about the involvement of fathers in childcare during the recession are grounded in the observed gaps between the elasticities to fathers' joblessness of mothers' working hours and the time children spend in informal childcare. The observed trends are often consequent with some of the hypotheses in the literature on intrahousehold allocation of time in household production as a response to unexpected changes in the macroeconomic conditions.

The economic crisis has possibly meant changes in the demand for non-parental care as jobless fathers may have become more involved in childcare at home; moreover, the observed changes may have come to

stay and the profile of the behavior of fathers of very young children may also have changed over the relatively long period of observation to one that is more educated and gender-equality aware. Further research on intrahousehold time-use allocation needs to be undertaken in the near future, when the relevant data will be available, to describe the evolution of these variables after the crisis. In countries where the recession was shorter, fathers' involvement in childcare has shown to be just temporary, and the distribution of parental childcare at home returned to the pre-recession patterns during the recovery (see Berik and Konder [2013]). Should the observed behavioral trend be confirmed after 2013 in Spain, it would inspire policy proposals such as maintaining efforts in the education of future generations of parents, both men and women, and the transmission of gender equality values so that fathers' involvement in childcare will no longer depend so much on their employment status.

The 2008 recession meant relevant changes in the outcomes under study: severe job losses made birth rates fall beyond the already very low levels, generating disutility and frustration in many women/couples and contributing to the financial imbalance in the Social Security system in the long run. At that time, the sharp drop in paid work in households with two or more children deterred couples from having more than one child. This also means that extra efforts in the childcare and early education system in Spain are needed to keep it in good shape and improve its quality. If the incipient economic recovery is confirmed in the years to come, the early education and care institutions must be ready to fuel female employment in the near future.

In broad terms, more public efforts should be made to defamilialize the provision of care in Spain, for both children and dependent adults, as most informal care within families still relies on women. Family-friendly policies at the firm level, such as flexible working schemes and the possibility of adapting the workday to school schedules, might also be of great help. However, the policy target that is needed most – and is the most difficult to achieve – is employment stability. This would really support women and families in having the number of children they wish and opting for the childcare of their choice. The 2012 labor reform, designed and passed in a time of high unemployment, financial and macroeconomic instability, and austerity-oriented fiscal policies, meant a considerable flexibilization of the Spanish labor market. It resulted in a higher elasticity of employment to GDP, but there is still much room for improvement in job quality.

Nuria Legazpe

*Universidad de Castilla-La Mancha - Economía española e internacional
Avenida de los alfares, 44 Facultad de Ciencias Sociales Edificio Gil de Albornoz,
Cuenca 16071, Spain
email: nuria.legazpe@uclm.es*

Maria A. Davia
 Universidad de Castilla-La Mancha - Economía Española e Internacional Albacete,
 Spain
 email: mangleles.davia@uclm.es

NOTES ON CONTRIBUTORS

Nuria Legazpe is temporary Associate Lecturer in Applied Economics at the Universidad de Castilla – La Mancha, Spain. She holds a PhD in Economics from the same university since 2012. Her expertise is focused on female labor market participation and fertility decisions in Spain, as well as youth labor markets and job satisfaction. Her work has been published in *Journal of Family Issues*, *Journal of Economic and Family Issues*, *Work, Employment and Society*, and *Review of Economics of the Household*, among others.

Maria A. Davia holds a PhD in economics in Universidad de Alcalá (Spain) since 2003 and is currently Lecturer in Applied Economics in Universidad de Castilla – La Mancha (Spain). Her expertise covers youth labor markets and youth poverty, school-to-work transitions, non-monetary benefits of education, and, most recently, female participation and fertility decisions. She has taken part in national and international (European Commission-funded) research projects, and she has published her work in diverse refereed journals and international monographs.

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NOTES

¹ According to a private survey, full-time (eight hours) average fees in private care centers were around 310 euros (including daily meals) per month in 2009 (Consumer Erosky 2009).

² Royal Decree 27/2003, dated 1-10-2003; introduced as a reform to the Income Tax Law, still in force.

³ Law 35/2007, dated 11-15-2007. It was colloquially known as “cheque bebé.”

⁴ The 3-year-old children in the sample are only up to 42 months old. Otherwise, at the moment of the interview (between January and June), they would already be in preschool. As already mentioned, the preschool net enrollment rate is nearly universal in 3- to 5-year-old children, so the demand for formal care in that age range is not relevant in our study.

⁵ Non-Spanish-born mothers were excluded from the sample since their partnership and fertility decisions might have taken place in their countries of origin and, therefore, in a non-observable context.

- ⁶ Throughout the text, mothers' partners are equivalent to fathers. We do not distinguish between fathers and stepfathers since we do not expect them to differ much in their involvement with child care. Moreover, the number of stepfathers in the sample is very small.
- ⁷ The receipt of family benefits is arguably endogenously related to a mother's employment status. We keep them in our specification because they cover a large range of benefits, some of which are related not to being employed, but to the level of household income. They also include the universal birth grant in force between July 2007 and December 2010.
- ⁸ The sample sizes do not allow splitting the sample by marital status. This is unfortunate, as marital status may influence not only the levels of the dependent variables (incidence and number of hours) but also the elasticity of mothers' behavior to other variables, such as household income and the receipt of child benefits.
- ⁹ NUTS1 are seven large areas which aggregate the seventeen regions/autonomous communities in Spain: Madrid, northeast (the Basque Country, Navarre, La Rioja, and Aragon), northwest (Galicia, Asturias, and Cantabria), center (Castilla y León, Castilla-La Mancha, and Extremadura), east (Catalonia, Valencia, and the Balearic Islands), south (Andalusia, Murcia, Ceuta, and Melilla), and the Canary Islands.
- ¹⁰ Because of the truncated nature of the dependent variables, the marginal effects in a *tobit* model are computed from the effects a linear model would provide times the estimated share of positive outcomes.

SUPPLEMENTAL DATA

Supplemental data for this article can be accessed at [10.1080/13545701.2019.1566754](https://doi.org/10.1080/13545701.2019.1566754)

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