Childcare restrictions and gender gap in labor outcomes

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Abstract

Persistent gender gaps exist in labor market outcomes. This study contributes to the literature by examining the gender gap effects of childcare restrictions. Specifically, not using professional childcare services due to issues like access, quality, or costs. Using a specialized module from the 2018 Spanish Labor Force Survey, we identify substantial gender gaps in labor force, employment, full-time employment and hours worked among parents facing childcare constraints. In contrast, parents without such restrictions experience much lower gender gaps. Working time flexibility helps to alleviate the gender gap in hours worked. Additionally, we explore the long-run consequences of extended work interruptions for childcare, revealing a significant decline in women's labor supply, employment rates and full-time share, particularly for career breaks lasting 5 years or more.

JEL Classifications: C21, J13, J16, J21

Keywords: childcare restrictions, gender gap, labor outcomes, working flexibility, work interruptions.

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1 Introduction

Although there have been important progress, gender disparities in the labor market persist across countries. According to the OECD database, the average gender participation and employment gaps remain substantial at approximately 14 percentage points (pp).[1] Furthermore, the unadjusted gender wage gap stands at roughly 12 percent, exhibiting considerable disparities that vary significantly from one country to another.

The presence of children is a key driver of gender inequality within the labor market (see, for example, Cortes and Pan (2020) and Bertrand (2020)). There is growing empirical evidence suggesting that while parenthood has minimal repercussions on fathers' labor market outcomes, mothers tend to experience a notable reduction in labor force participation and a decrease in both employment as well as in the number of hours worked. Additionally, they face a decline in their hourly wages and overall earnings.[2] Importantly, these costs extend over the course of women's lives rather than being short-term, regardless of variations in family policies (Kleven et al. (2021)).

The arrival of children requires a significant allocation of time to childcare responsibilities, resulting in interruptions and reductions in working hours, particularly for mothers. According to data from the Eurostat Database, 42.6% of mothers and 4.2% of fathers in the European Union have experienced work interruptions to take care of their children. Among these parents, 37.6% of mothers and 7.7% of fathers have had their careers interrupted for more than 2 years while caring for their children, highlighting the potential impact on mothers' work participation.[3]

Work interruptions caused by childcare responsibilities, however, can be mitigated with the presence of working flexibility, support from family members, or the use of professional childcare services. Thus, childcare costs can be critical in mothers' working decisions. As Casarico et al. (2023) mention, if the household has enough resources to afford childcare services, both parents can work and accumulate experience, granting the household a higher lifetime income. However, in situations where borrowing against future earnings is not an option, certain households with children may find themselves unable to cover the expenses associated with childcare. High childcare costs often lead to a liquidity constraint, compelling one of the parents, usually the mother, to discontinue working. According to data from the Eurostat Database, the percentage of mothers who do not work due to the high cost of childcare services varies across European countries, ranging from 0.6% in Czechia to 7.5% in Romania.[4]

In this paper, we initially examine how the presence of restrictions on the use of childcare services affects gender disparities in labor force participation, employment, full-time employment, and hours worked among parents with children below 15 years of age. In our context, childcare restrictions are defined as the choice not to utilize professional childcare services due to factors such as the absence of access, lack of quality, or associated costs.

Our analysis extends beyond merely comparing gender gaps between these parents and those affording professional childcare services. We also look at gender gaps observed among parents re-

[1] See Table LFS by sex and age - indicators from the OECD.Stat

[2] The growing literature on the effects of parenthood on women relative to men includes: Angelov et al. (2016), Kleven et al. (2019), Sieppi and Pehkonen (2019), (Quinto et al., 2021), Casarico and Lattanzio (2023) and Kleven et al. (2023), among others.

[3] See the Eurostat Database table 'Population with work interruption for childcare by duration of interruption and educational attainment level (lfso18stlened)".

[4] See the Eurostat Database table "Population not using childcare services by main reason (lfso18cobs)."

ceiving support from family members or choosing to provide childcare themselves. Furthermore, we study how the flexibility of working hours for childcare influences labor market outcomes, thus impacting gender disparities. Finally, we explore the long-run labor market consequences of work interruptions related to childcare responsibilities. To the best of our knowledge, our study represents an effort to systematically analyze the gender gap effects of childcare restrictions. This is in contrast to the prevailing focus in existing empirical literature on childcare restrictions, which predominantly concentrates on mothers' behavior without explicitly examining the gender disparities associated with the presence of these restrictions (Morrissey (2017)).

Our analysis is based on on cross-sectional data extracted from an ad-hoc module of the 2018 Spanish Labor Force Survey. This module is specifically designed to capture information related to the balance between work and family life. Notably, it includes variables detailing the utilization of various childcare options, encompassing professional services, assistance from relatives, and parents personally providing childcare. The module also looks at the primary reasons for not utilizing childcare services, considering factors such as accessibility, quality, and financial cost. Additionally, it incorporates information on working time flexibility for care giving responsibilities, and the duration of career breaks due to childcare. This comprehensive database serves as a valuable resource for understanding the role of childcare services in shaping gender disparities in labor markets.

The estimated linear regression models reveal the presence of pronounced gender gaps in labor force (30.5 pp) employment (38.6 pp), full-time employment share (41.2 pp) and hours worked (31.4%) among parents who face constraints in using childcare services. In contrast, a much lower gender gaps are observed in parents using childcare services, with figures of 5.4 pp, 7.7 pp, 20.1 pp and 22.4%, respectively. This underscores the significant impact of accessibility and affordability of childcare services in exacerbating gender disparities in labor-related outcomes.

Furthermore, our analysis indicates that working time flexibility for childcare leads to a reduction in the gender gap in hours worked among parents facing restrictions in the use of childcare services. Notably, the gender gap in hours worked increases from 28.7% to 32.8% from an scenario of working flexibly to a one without working flexibility. This suggests that working time flexibility contributes to the work-life balance, alleviating the gender disparity in the number of hours devoted to work.

In our final analysis, we delve into the long-term repercussions of work interruptions arising from childcare responsibilities, specifically focusing on women who ceased working for at least one month when their children were below 15 years old, and no longer have children in that age range. Our study reveals that mainly career breaks lasting 5 years or more significantly diminish the labor supply and employment rates of these women. The estimations demonstrate a notable decline in the labor force rate from 76.7% to 62.6% and in the employment rate from 69.8% to 52.9% as the length of the career interruption increases from less than 6 months to more than 5 years. In terms of hours worked, our analysis indicates a less pronounced but still notable impact, with hours falling from 3,300 to 3,050 per year, representing a 7.5% decrease. In turn, the full-time employment share falls from 86.5% for interruptions below 6 months to around 70% for interruptions above 2 years. This underscores the substantial and enduring impact of extended career breaks for childcare on woman labor outcomes.

Section 2 of the paper explores the related literature on childcare restrictions and gender gaps in labor outcomes. Section 3 outlines the data and some descriptive statistics. Section 4 presents the empirical methodology while section 5 shows the estimated results. Finally, section 6 concludes.

2 Related literature

There is an extensive literature analyzing the impact of childcare restrictions on labor markets. From a theoretical standpoint, Blau and Robins (1988) study the effects of childcare costs in a one-period family labor supply model in which there are three potential sources of childcare: the mother, the potential informal provider, and the market. In their model, the labor supply decisions of the mother and other household members are modeled jointly with the decision to purchase market childcare. The model shows that both the decision to become employed and the decision to purchase market childcare are sensitive to childcare costs.[5]

Contemporary theoretical literature extends its focus to the employer's role in the labor market, investigating how childcare restrictions contribute to gender inequality in labor market outcomes. For instance, Bjerk and Han (2007) develops a model wherein firms face adjustment costs when their workers resign. The model incorporates the idea that males and females with similar skills form households with distinct home care requirements. Each household must deliberate whether both members should remain in the workforce and acquire necessary home care externally or if one member should exit the labor market to internally provide the required care. Given that women are more likely to leave the labor market, firms transfer adjustment costs to them by offering lower wages compared to equally skilled males. Therefore, Bjerk and Han (2007) shows that a key source of gender wage and labor market participation inequality is the cost of purchasing home care services from the market.

Casarico et al. (2023) extend the Bjerk and Han (2007) model by introducing a second period wherein both men and women work, and there are no childcare-related costs. Notably, childcare expenses must be covered during the initial working period, and without the option to borrow from future earnings, certain households may find themselves unable to afford these costs. Consequently, constrained by financial limitations, women exit the labor market to attend to their childcare responsibilities. Anticipating women's periods of leave, firms penalize women by offering lower wages. Thus, the presence of liquidity constraints related to the presence of childcare costs increases gender wage and participation gaps, compared to a situation in which all households interested in buying childcare can afford to do so. Their model also delves into the enduring impacts of interruptions in employment caused by childcare responsibilities. In the second period, wages are contingent on accumulated work experience, a factor that tends to be lower for mothers who have taken breaks in their careers to care for their children. Consequently, facilitating the return to work for mothers in financially constrained households not only diminishes gender gaps in the labor market immediately after having children but also yields long-term benefits. This is achieved by enhancing their work experience and, consequently, elevating their wages over time.

Empirical evidence aligns with the theoretical implications outlined in the preceding theoretical models. Akgunduz and Plantenga (2018) offer a comprehensive survey of 44 estimates concerning the elasticity of labor force participation in relation to childcare costs, drawing from approximately 36 English-language articles published between 1988 and 2010. Notably, the majority of these estimates (37 out of 44) indicate negative elasticities, signifying a consistent trend where increased childcare costs are associated with decreased labor force participation. Only

[5]Similar one-period labor supply models with childcare restrictions are discussed in Connelly (1992), Ribar (1992) and Powell (1997), among others. A comprehensive survey of these of models is available in Akgunduz and Plantenga (2018).

in seven estimations did the relationship appear non-significant. The data sources employed in this body of literature predominantly consist of surveys that incorporate information regarding childcare expenditures.

Morrissey (2017) and Boca (2015) also review and compare empirical results regarding the impact of childcare costs and availability, examining variations across different groups. The findings indicate that reductions in childcare costs and increases in childcare availability increases mothers' labor force participation, although the effect sizes vary widely. Moreover, Boca (2015) suggests that the impact of childcare availability and costs is more pronounced among those mothers from more disadvantaged backgrounds. In turn, childcare programs targeting lower-income and less educated families have greater effectiveness compared to programs benefiting households with higher incomes.

In contrast to our empirical analysis, the existing studies predominantly focus on mothers' behavior without explicitly examining the gender gap effects of childcare costs. As Morrissey (2017) already mention, there is a lack of research on the effects of childcare costs and availability on fathers' employment responses, which remains an important issue given fathers' increased involvement in the lives of young children. Consequently, to the best of our knowledge, our study represents a pioneering effort to systematically analyze the repercussions of childcare restrictions on the gender disparities in labor force participation, employment, and hours worked.

One exception is Sikirić (2021) who use panel data analysis to examine whether the cross-country differences in gender employment gaps in the EU–28 are associated with differences in the use of formal childcare arrangements for children under the age of 3. They show that the use of childcare reduces employment gender inequality in the labor market. They also show that both part-time work arrangements help women combine parenthood and employment while long leaves have a negative impact on women's employment.

Talamas Marcos (2023) also evaluates the impact of childcare availability on the employment probability gap among parents. He utilizes the timing of grandmothers' deaths—the primary childcare providers in Mexico—as a source of identifying variation. The results reveal that, following the death of grandmothers and the consequent reduction in childcare availability, mothers experience a 12-percentage-point decline (27 percent) in their employment rate, whereas fathers' employment rates remain unaffected. This negative effect on mothers' employment is somewhat mitigated in regions where public daycare is more accessible or private daycare and schools are more affordable.

In contrast to Sikirić (2021) and Talamas Marcos (2023), our study goes beyond examining the effects of childcare restrictions solely on the employment gender gap. We extend our analysis to explore gender disparities in the overall labor force, full-time employment rate and hours worked. Moreover, It's worth noting that our database incorporates information on working flexibility for childcare. This inclusion allows us to explore whether such flexibility can serve as a mitigating factor in addressing the challenges posed by excessively high childcare expenses in certain households. Finally, we explore the long-run consequences of work interruptions related to childcare responsibilities on gender gaps.

3 Data

In this section, we will present the data used, the sample selection applied in each exercise, and some descriptive statistics of the main variables.

The empirical analysis conducted here exploits a unique dataset containing information on labor market participation and childcare restrictions in Spain. Specifically, we use a special module of the 2018 Labor Force Survey (LFS) that contains information on the conciliation of work life and family life. The conciliation module is part of the Community Workforce Survey, a survey conducted in a coordinated manner within the European Union, and included by Spain in the LFS. In the case of Spain, during the second quarter of each year, the LFS introduces a set of inquiries addressing specific themes relevant to the labor market. In 2018, the focal point was the reconciliation of work and family life, with questions targeted at parents aged between 18 and 64 years.

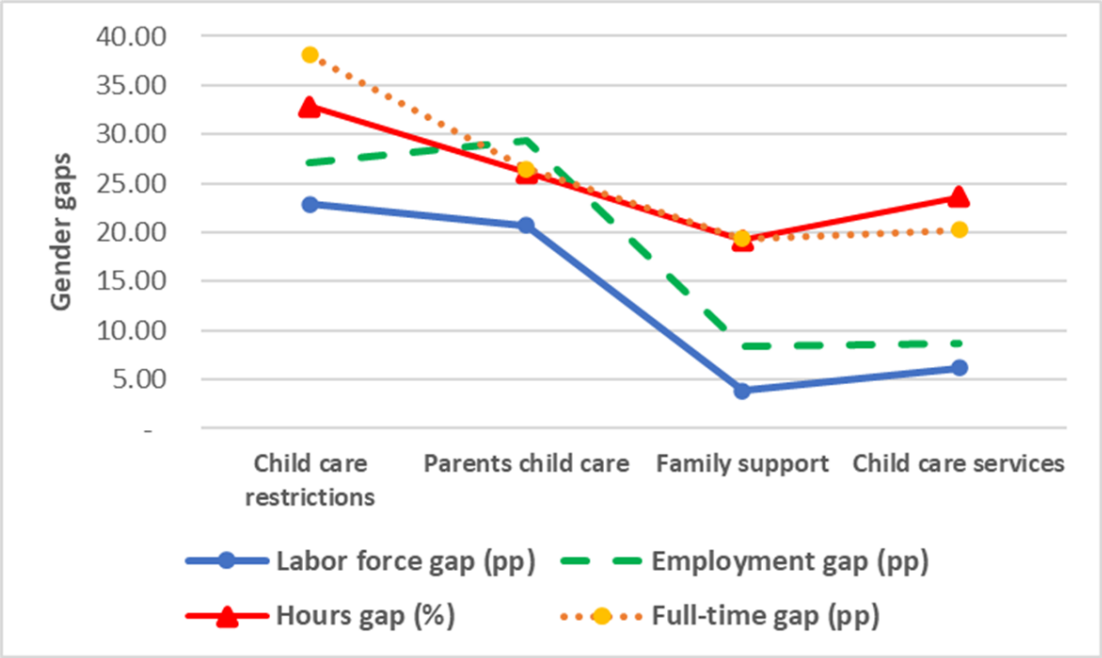
To delve into this topic, we conduct both short-term and long-term analyses. Firstly, for the short term, we explore how different childcare options when having a child under 15 years old affects the gender gap in various labor market outcomes. For this exercise, we select only fathers and mothers with their own children or the partner's children under 15 years of age living in the household, or their own children or the partner's children under 15 years of age outside the household whom they care for regularly. Furthermore, we excluded from the sample those who regularly care for children with disabilities or older adults, and we considered only those adults aged 25 to 60. Additionally, we exclude parents who provide "do not know" responses to the childcare-related questions and those who indicate that childcare services are unnecessary due to their children being sufficiently mature to care for themselves, likely indicating an age proximity to 15 years or older. We have a total of 12,275 individuals for conducting the short-run analysis.

Concerning childcare choices, our analysis incorporates four distinct and mutually exclusive options. The primary category serves as our reference point and involves hiring professional services. The variable is called *childcare services* (See Table 1). The subsequent options encompass: (i) abstaining from childcare hiring due to economic constraints or unavailability attributed to high costs (childcare restrictions), (ii) forgoing childcare engagement because family members attend to the children (*family support*), and (iii) refraining from childcare hiring as children are under the care of their fathers or mothers (*parents childcare*). A schematic explanation of the variables of childcare is provided in Table A.1 at the appendix. It is important to emphasize that the Survey does not consider compulsory education when referring to various types of childcare. Thus, the question "Do you use childcare services" from the LFS survey refers to the regular utilization of professional childcare services that are unrelated to compulsory education. In essence, this question focuses on the hours outside of the regular school day. It's important to highlight that working hours in Spain tend to be quite extensive, and, in many instances, parents depend on these childcare services to enable them to fulfill their work commitments.

For the long-term analysis, we explore the impact of labor market interruptions due to motherhood on labor force, employment, full-time share and hours worked. Our focus is specifically on mothers aged 45 or more who have children above 15 years old. We have a total of 2,808 women for carrying out the long-run analysis.

Table 1 presents the average values of the variables considered for both the short and long-run scenarios, most of which are binary (taking values of 0 or 1). Regarding the former scenario, our primary explanatory variable called childcare restrictions reveals that 9.1% of parents refrain from utilizing childcare services due to perceived cost or inaccessibility. Furthermore, the benchmark childcare category comprises parents using childcare services, encompassing 21.2% of parents. Also notice that 30.4% of parents declare that they have working flexibility due to childcare. Concerning labor market outcomes, parents in the short-run scenario exhibit an average labor force participation rate of 89.8%, an employment rate of 79.9%, a full-time em-

Figure 1: **Row gender gaps in labor market variables**



Notes: Gender gaps refer to the difference between males and females.These gaps are calculated using the labor outcomes in Table A.2

ployment share of 85.7%, and an average annual hours worked of 3,665.

In the context of our long-term analysis, our key regressor is referred as working interruptions, which shows the overall duration of work interruptions attributable to childcare responsibilities. Interestingly, 17.5% of parents considered mention that they interrupted their working career for 5 years or more. In this long-run scenario, labor force, employment, full-time share and annual hours stand at 73.9%, 66.3%, 82.7% and 3,208 hours, respectively.

An initial insight into the significance of childcare restrictions explaining gender disparities is depicted in Figure 1. The figure illustrates the differences in labor market outcomes between fathers and mothers across the four childcare categories considered. Notably, the most substantial gender gaps are observed among parents facing childcare restrictions, with disparities in labor force, employment, full-time and hours amounting to 22.9 pp, 27.1 pp, 38.1 pp and 32.8%, respectively. In contrast, parents utilizing professional childcare services exhibit considerably lower gender gaps, measuring 6.2 pp, 8.7 pp, 20.2 pp and 23.6%, respectively.

4 Methodology

In this section, we present our empirical strategy. As previously explained, our first step involves analyzing the short-term effects of different childcare options on labor market outcomes. To accomplish this, we implement the following linear regression model:

$$Y_i = \gamma_0 + \beta_1 Women_i + \beta_2 ChildcareOption_i + \beta_3 Women_i * ChildcareOption_i + \delta' X_i + \epsilon_i \quad (1)$$

Table 1: **Long and short run models' variables**

Short-run Model (12,275 parents)			
Variable	**Units**	**Definition**	**Mean**
Labor force rate	0/1	Participating in the labor force	.898
Work	0/1	Being employed	.799
Full-time	0/1	Being a full-time worker	.857
Hours worked	0/1	Annual hours worked	3,665.3
Women	0/1	If the individual is a mother	.5247
Age	years	Age of the individual	41.06
Childcare categories		Four categories for childcare	
Childcare restrictions	0/1	Not using childcare services because they are too expensive or inaccessible	.0908
Parents childcare	0/1	Parents do not need childcare services because they do it	.500
Family support	0/1	Parents do not need childcare services because relatives do it	.213
Childcare services	0/1	Parents use professional childcare services	.212
Spanish	0/1	Having Spanish citizenship	.908
Education		Level of education	
Primary	0/1	Primary education	.049
Secondary	0/1	Secondary education	.485
Tertiary	0/1	Tertiary education	.407
Post Tertiary	0/1	Post Tertiary education	.0571
Working flexibility	0/1	Possibility to adjust the working schedule due to childcare	.304
Long-run Model (2,808 female parents)			
Labor force rate	0/1	Participating in the labor force	.739
Work	0/1	Being employed	.663
Full-time	0/1	Being a full-time worker	.827
Hours worked	0/1	Annual hours worked	3,208.1
Age	years	Age of the individual	55.22
Spanish	0/1	Having Spanish citizenship	.978
Education		Level of education	
Primary	0/1	Primary education	.066
Secondary	0/1	Secondary education	.555
Tertiary	0/1	Tertiary education	.337
Post Tertiary	0/1	Post Tertiary education	.042
Working interruption		Total time of working interruption due to childcare	
less 6 months	0/1	Less than 6 months	.482
6 months to 1 year	0/1	More than 6 months and less than 1 year	.175
1 to 2 years	0/1	More than 1 year and less than 2 years	.076
2 to 3 years	0/1	More than 2 years and less than 3 years	.045
3 to 4 years	0/1	More than 4 years and less than 5 years	.047
more than 5 years	0/1	More than 5 years	.175

Source: The 2018 Special Spanish Labor Force Module: Balance between work and family life.

Where Y_i represents various labor market indicators for each parent i. Specifically, we utilize four different labor market indicators: participation in the labor force, employment status, full-time worker and the number of hours worked by those employed. The first two are dichotomous variables, taking the value 1 if the parent belongs to the labor force (either working or being unemployed) in the first case and if the parent is employed in the second case. The full-time variable is also a dichotomous variable taking the value 1 if the parent has a full-time job and

0 if she has a part-time one. The last indicator represents the number of hours an individual works per year.

$Women_i$ is a binary variable with a value of 1 if the parent is female. The variable $ChildcareOption_i$ is a categorical variable that encompasses the four different childcare options: *childcare restrictions*, *parents childcare*, *family support* and *childcare services*. The reference category for comparison is the option of contracting *childcare services*.

Our parameters of interest are β_2 and β_3 which explain how each childcare option affects the gender gap in different labor market indicators. More in detail, β_2 captures the labor market effect of each childcare option on males while $\beta_2 + \beta_3$ measures the effect on women.

On the other hand, X_i represents the control variables we use: age, age squared, nationality (a binary variable with a value of 1 for Spanish individuals), education (a categorical variable with the following four categories: primary, secondary, tertiary and post tertiary education), and autonomous community (a categorical variable representing different regions). Finally, the error term is denoted by ϵ.

We estimate linear regression models for each of the four dependent variables. As a result, we can directly interpret the coefficients as marginal effects. However, for binary dependent variables, we also estimate logit and probit models, and the results remain very similar. Additionally, besides estimating and calculating the marginal effects, we also present the gender gap for each of the childcare options to analyze when this gap increases or decreases.

For the dependent variable $Hours_i$, we introduce the variable $Flexibility_i$ to analyze the effect of having a job that allows for more flexible work schedules for childcare on hours worked and the gender gap. Specifically, we estimate equation 1 but including $Flexibility_i$ as an additional explanatory variable. We interact $Flexibility_i$ with $Women_i$ to examine whether $Flexibility_i$ differentially affects men and women.

$$\begin{aligned} Hours_i = \gamma_0 + \beta_1 Women_i + \beta_2 ChildCareOption_i + \beta_3 Women_i * ChildCareOption_i \\ + \beta_4 Flexibility_i + \beta_5 Women_i * Flexibility_i + \delta^{'} X_{it} + \epsilon_{it} \end{aligned} \tag{2}$$

Finally, we calculate the long-term effects of labor market interruptions for women. As mentioned earlier, our sample is comprised of women over 45 years of age who do not have children below 15 years old anymore and who have experienced interruptions in their professional careers due to childbirth. We excluded from the sample women who provide regular care for disabled or ill children or family members. Specifically, we estimate the following regression model:

$$Y_i = \gamma_0 + \beta_1 Interruptions_i + \delta^{'} X_i + \epsilon_{it} \tag{3}$$

The dependent variables in this analysis are the same as those in equation 1. The variable $Interruptions_i$ represents the total duration related to childcare interruptions and is a categorical variable with six values: less than 6 months, 6 months to 1 year, from 1 year to 2 years, from 2 years to 3 years, from 3 years to 5 years, and more than 5 years. The reference category for comparison is the option of less than 6 months. Finally, the control variables X_i are also the same as in equation 1.

5 Results

In this section we first report the estimated results for the short-run model equations 1 and 2. Then, we present the long-run estimated effects of working interruptions related to childcare on labor market outcomes by using equation 3.

5.1 Short-run effects of childcare restrictions

Table A.3 in the appendix presents the estimated parameters of the short-run model. Then, Table 2 resumes the marginal effect of each of the childcare categories with respect to the scenario where parents are using childcare services. The first row shows that the presence of childcare restrictions stemming from expensive or inaccessible childcare services has no effect in labor force participation of men. In turn, for women, it decreases labor force participation by 16.9 pp.

Concerning employment, we observe reduction of 4.6 pp in the employment rate of men, while it reveals a reduction of 23.9 pp in the employment rate of women. Likewise, childcare restrictions exhibit no statistically significant impact on the annual hours worked by men but lead to a reduction of 358 hours worked for women. Similarly, the variable full-time has no impact on males but reduces the full-time employment share of females by 18.1 pp. As a result, households facing childcare restrictions amplifies the gender gap in both the extensive and intensive margins of the labor supply.

Table 2: **Marginal effects of the childcare categories**

	Labor force		Employment		Hours worked		Full-time	
	father	mother	father	mother	father	mother	father	mother
childcare restrictions	.0048	-.1692***	-.0464***	-.2385***	33.5	-358.6***	.00002	-.1810***
	(.0090)	(.0189)	(.0170)	(.0212)	(116.3)	(110.3)	(.0112)	(.0291)
Parents childcare	-.0112**	-.16806***	-.0316***	-.2566***	-164.5**	-198.1***	-.0050	-.0732***
	(.0051)	(.0104)	(.0090)	(.0127)	(70.2)	(68.0)	(.0069)	(.0167)
Family support	.0025	.0123	.0123	-.0055	-123.4	102.4	.00711	.0133
	(.00539)	(.0093)	(.0096)	(.0128)	(82.4)	(74.5)	(.0073)	(.0173)
Working flexibility	-	-	-	-	-590.5***	-243.1***	-	-
	-	-	-	-	(52.1)	(52.9)	-	-

Notes: We report the marginal effects of the childcare categories in the labor market variables that come from the estimated parameters in Table A.3.

Table 2 further reveals, as anticipated, that when parents opt not to utilize childcare services because they handle it themselves, the gender gap sees a significant increase. To elaborate, when men undertake childcare responsibilities themselves, their labor force participation and employment rates falls by 1.1 pp and 3.2 pp, respectively. In turn, the labor force participation and employment rates of women experiences a decline of 16.8 pp and 25.7 pp, in each case. In terms of the intensive margin of the labor supply, the table reveals that when parents take on childcare responsibilities, it leads to a reduction of 164.5 and 198.1 hours worked in males and females, respectively. A portion of the decrease in women's working hours stems from their transition to part-time positions, leading to a 7.3 percentage point decline in the share of full-time employment. Ultimately, the influence of family support on childcare does not exhibit a significant impact on labor outcomes when compared to the benchmark scenario of utilizing

professional childcare services.

Concerning the incorporation of flexible working arrangements for childcare, the final row of Table 2 illustrates a notable reduction in gender disparities associated with working hours. To elaborate, the introduction of flexibility results in a decrease in the annual hours worked by males and females when compared to a scenario where such flexibility is absent, indicating reductions of -590.5 and -243.1, respectively. This compelling evidence indicates that the adoption of flexible working hours significantly contributes to achieving a healthier work-life balance. Furthermore, it serves as a mechanism to mitigate the gender disparity observed in the number of hours dedicated to work by parents.

In summary, the findings presented in Table 2 shed light on the importance of different childcare categories and their impact on labor force participation, employment, full-time jobs and hours worked for both women and men. The coefficients related to restrictive childcare conditions, marked by cost, quality or accessibility barriers, reveal statistically significant effects. Males, facing such restrictions, do not exhibit a significant effect in most of these labor market outcomes, while females experience a notable decrease in all of them. Therefore, households dealing with these restrictions contribute to the widening of the gender gap across both extensive and intensive margins of labor supply.

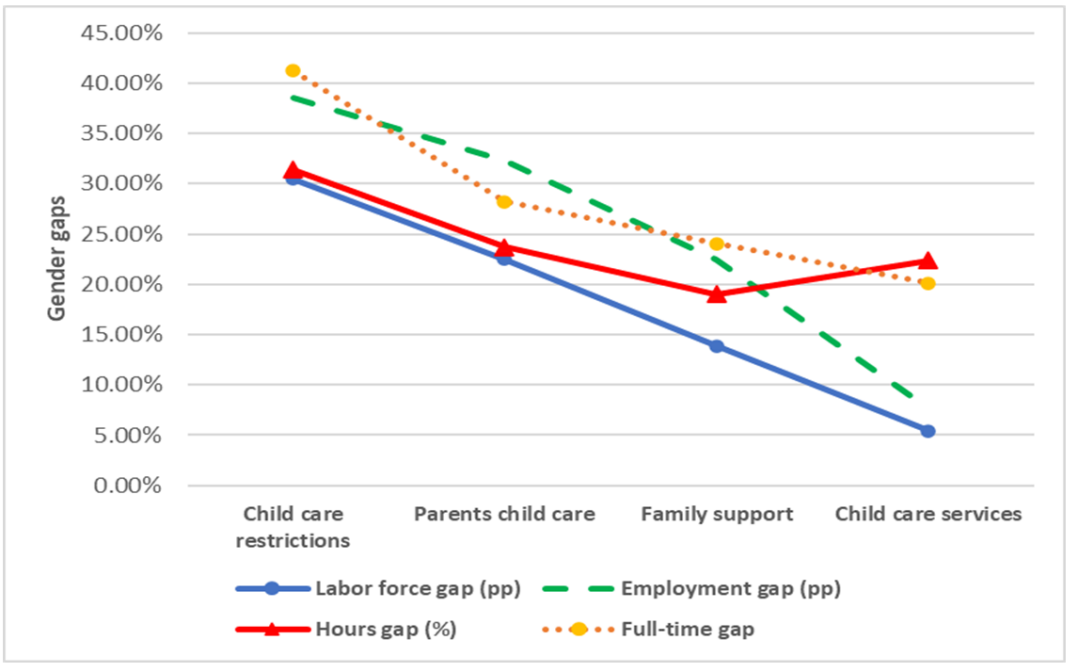
To better visualize the impact of the presence of childcare restrictions on gender gaps, we utilize the estimated parameters from Table A.3 and calculate the predicted values of labor market outcomes conditional on each of the childcare categories while holding all other explanatory variables constant (See Table A.4). We then compute the resulting gender gaps in labor force, employment, full-time and hours worked. As depicted in Figure 2, the existence of childcare restrictions emerges as a prominent factor, yielding the highest gender gap among the four considered childcare categories. In the presence of these restrictions, the gender gaps in labor force participation, employment rates, full-time share and hours worked stand at 30.5 pp, 38.6 pp, 41.2 pp, and 31.4%, respectively. In contrast, these gaps significantly diminish to 5.4 pp, 7.7 pp, 20.1 pp, and 22.4% when parents are using professional childcare services. This significant contrast underscores the important role of childcare services in fostering gender equality between parents.

In turn, Figure 3 illustrates that the introduction of working flexibility for childcare serves to alleviate gender disparities in hours worked. For instance, when confronted with childcare restrictions, the gender gap in annual hours worked is substantial at 32.8%. However, this figure decreases to 28.7% when parents utilize professional childcare services. It's worth noting that the positive impact of working flexibility extends beyond this scenario, contributing to a reduction in the hour gender gap across the other three childcare categories.

Morrissey (2017) points out that it is unclear whether education moderates the effects of childcare costs on parental employment. In turn Boca (2015) finds that increases in employment in response to childcare availability are stronger among less educated women across 15 European countries. The special 2018 module of the Spanish Labor Survey shows that low educated parents are more willing to suffer from childcare restrictions. According to this survey, 16.5% of parents with primary education mention that they not use childcare services due to the high costs. This number is much lower among parents with tertiary education (6.9%).

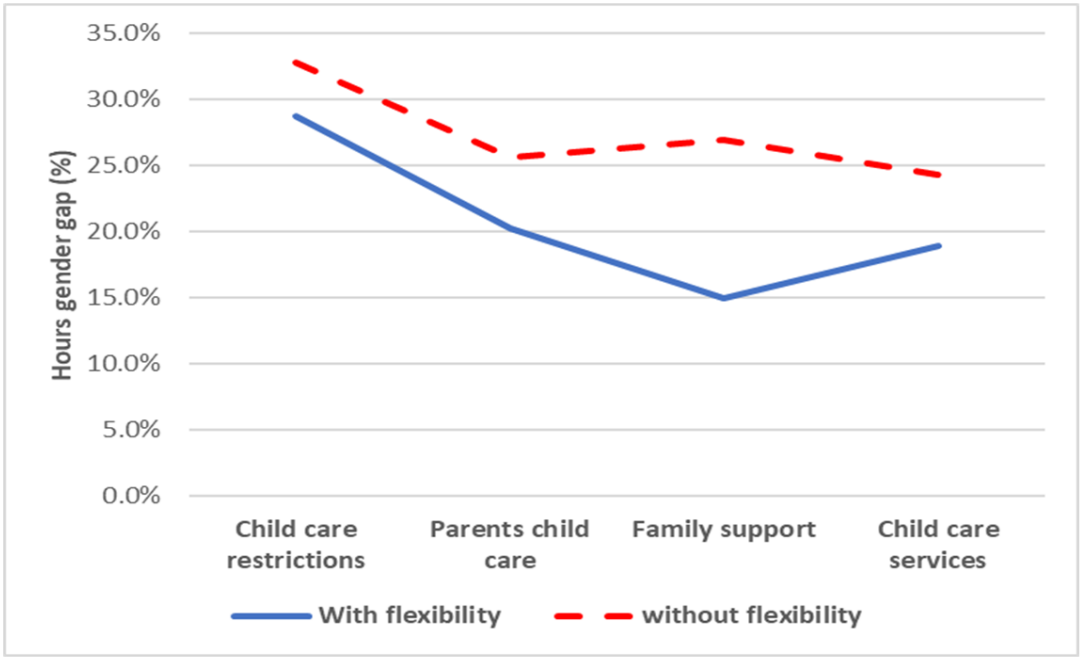
To explore if education mitigates the gender gaps between parents with childcare restrictions, we first estimate equations 1 and 2 by dividing the total sample into two groups: parents with lower educational level (secondary or below) and those with higher educational level (tertiary or above). Then, we use the estimated coefficients to calculate the predicted labor outcomes

Figure 2: **Predicted gender gaps in labor market variables**



Notes: Gender gaps refer to the difference between males and females. These gaps are calculated using the predicted labor market variables from Table A.4.

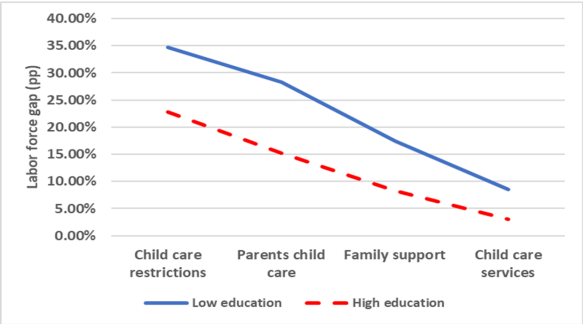
Figure 3: **Predicted gender gaps in hours worked with and without working flexibility**



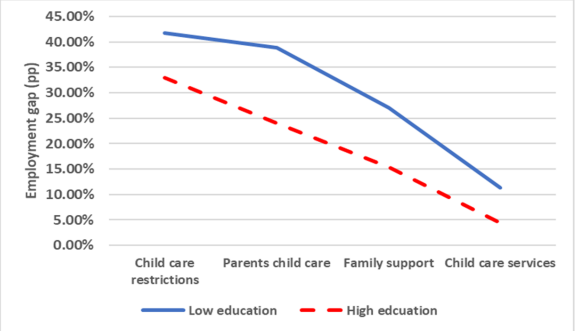
Notes: Gender gaps denote the disparities between males and females, and these gaps are computed based on the predicted labor market variables presented in Table A.4. Working flexibility is defined as the ability to adjust one's working schedule to accommodate childcare responsibilities.

Figure 4: Predicted gender gaps in labor market variables by level of education

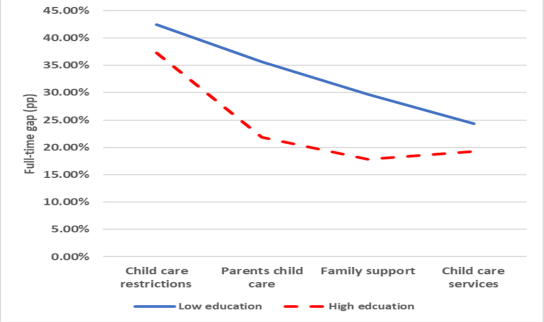
(a) Labor force rate gap



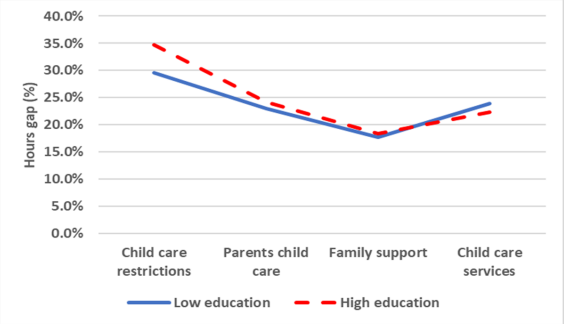
(b) Employment gap



(c) Full-time gap



(d) Hours gap



Notes: Gender gaps refer to the difference between fathers and mothers. These gaps are calculated using the predicted margins from the estimated equation 1 by level of education.

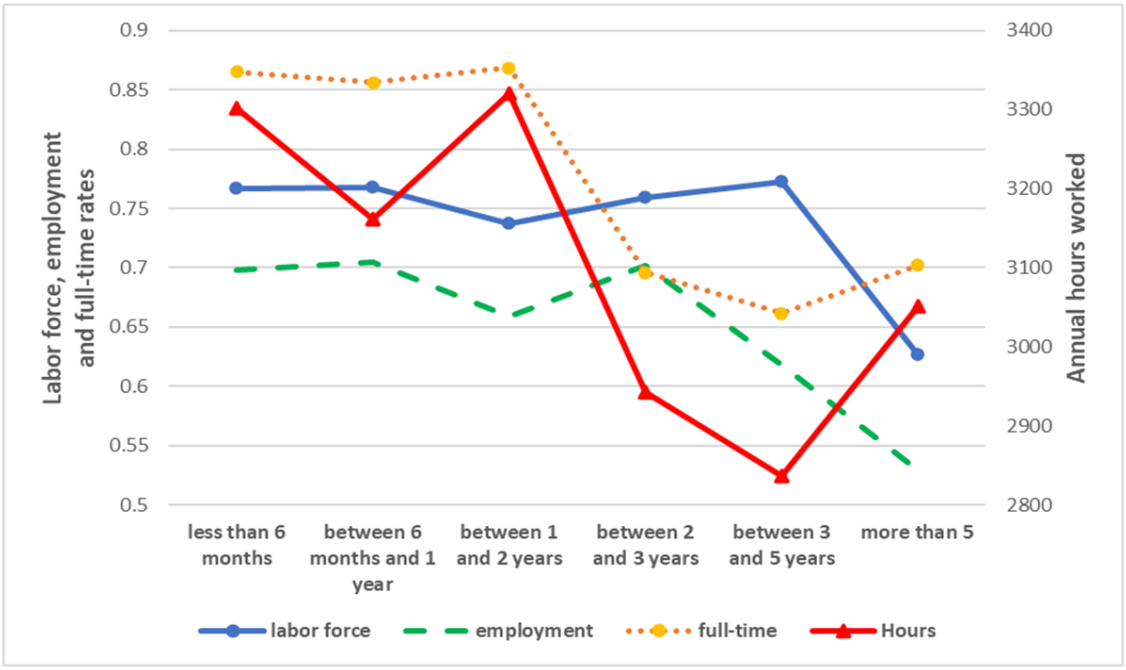
in each childcare category for each level of education. Finally, we compute the gender gaps in labor force, employment, full-time jobs and hours worked.

Figure 4 illustrates the calculated gender gaps. Notably, education emerges as a substantial mitigating factor in the labor force gender gap, particularly among parents refraining from utilizing childcare services due to either their prohibitive costs or unavailability. As depicted in Figure 4(a), this gap significantly decreases from 34.7 pp for parents with lower educational levels to 22.8 pp for those with higher educational attainment. The influence of education is also important in addressing the gender employment and full-time gaps under the presence of childcare restrictions, with a reduction in the employment gap from 41.7 pp to 32.9 pp (Figure 4(b)), and in the full-time share from 42.4 pp to 37.3 pp (Figure 4(c)). In contrast, Figure 4(d) shows that education amplifies the hours gender gap for parents with childcare constraints from 29.5% in low educated to 34.7% among high educated parents. As depicted in Figure 4, it becomes evident that education not only serves to mitigate gender gaps in the labor force and employment among parents contending with childcare restrictions but also plays a significant role in reducing these gaps across other childcare categories. Consequently, the level of education emerges as a pivotal factor in alleviating gender inequalities within the labor market.

5.2 Long-run effects of interruptions in the labour market

In this subsection, we present the long-term effects of labor market disruptions. Figure 5 represents the predicted effects for each interruption period with respect to the reference of less

Figure 5: **Interruptions and labor market outcomes**



Notes: Labor force participation, employment, full-time share and hours are calculated only for women between 45 and 60 years old, with children at home above 15 years old.

than 6 months. Tables A.5 and A.6 in the appendix show all the estimated coefficients of the model and the corresponding predicted labor market outcomes.

We observe distinct patterns for the labor market outcomes. When considering employment, transitioning from interruptions of less than 6 months to interruptions exceeding three years leads to an 8.0 pp decrease in the employment rate. This decreases further to 16.9 pp if the interruptions extend beyond 5 years. In turn, the full-time share falls from 86.5% for interruptions below 6 months to 69.5% for interruptions between 2 and 3 years with no additional reductions after this period. In terms of labor force participation, the most significant drop occurs after 5 years of interruptions, with participation falling by 14.0 pp, declining from 76.6% to 62.6%. This implies that only accumulated interruptions exceeding two years significantly impact long-term outcomes in the labor market.

In terms of hours worked, our analysis indicates a less pronounced but still notable impact, with the hours falling from 3,300 for parents facing working interruptions below 6 months to 3,050 for parents with more than 5 years of labor interruptions due to childcare, representing a 7.5% decrease.

To conclude, it is evident that an extended absence from the labor market imposes a substantial cost on women. childcare options become increasingly relevant because interruptions in the labor market make re-entry more challenging, leading to a subsequent drop in labor outcomes.

6 Conclusions

While advancements have been made, persistent gender disparities in the labor market remain a global concern. The presence of children emerges as a key driver of gender inequality in the labor market. Empirical evidence suggests that parenthood has a minimal impact on fathers' outcomes, while mothers experience reductions in labor force participation, employment, and hourly wages.

Childcare responsibilities, particularly for mothers, lead to significant interruptions and reduced working hours. These interruptions can be mitigated with working flexibility, family support, or professional childcare services. Childcare costs play a crucial role in mothers' working decisions, with households able to afford childcare services experiencing higher lifetime incomes.

We explore how restrictions in using childcare services affect gender gaps in the labor force, employment, full-time employment share, and hours worked among parents with children under 15. We go beyond financial constraints, examining gender gaps among parents who receive family support or provide childcare themselves. Working time flexibility for childcare is also analyzed, along with the long-term consequences of work interruptions.

Using a specialized module from the 2018 Spanish Labor Force Survey, we identify substantial gender gaps in labor force (30.5 percentage points (pp)), employment (38.6 pp), full-time employment (41.8 pp) and hours worked (31.4%) among parents facing childcare constraints. In contrast, parents without such restrictions experience much lower gender gaps (5.4 pp, 7.7 pp, 20.1 pp, and 22.4%, in each case). We also show that working time flexibility helps to alleviate the gender gap in hours worked. Additionally, we explore the long-run consequences of extended work interruptions for childcare, revealing a significant decline in women's labor supply and employment rates, particularly for career breaks lasting 5 years or more. This underscores the enduring impact of extended career breaks for childcare on women's labor outcomes.

In conclusion, our study sheds light on the impact of childcare on gender disparities in the labor market, emphasizing the importance of childcare accessibility, affordability, and flexibility in shaping women's career trajectories. Addressing these issues is crucial for promoting a more equitable and inclusive labor market.

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A Supplemental

Table A.1: **Construction of childcare variables**

Variable M3	**Variable M4**	**Variable M5**
Do you use childcare services?	If M3 is NO, reason:	If M4 is NO NEED, reason:
1.Yes		
2. Occasionally		
3. No	1. Unavailability	
	2. They are expensive	
	3. Bad Quality	
	4. Bad schedule	
	5. Other reasons	
	6. No need	1. Parents do it
		2. Family Support

M3, M4, and M5 are the variable names within the database. We categorize "childcare services" under the blue color. It includes parents regularly using professional services (not related to compulsory education) for the care of their own children or their partner's children under 15 years of age, whether they reside inside or outside the household. The category"childcare restrictions" in red color is related to the primary reason for not regularly using professional services for childcare. The last two categories are related to the reasons for not needing or being uninterested in professional services for childcare: "Parents childcare" under orange color implies that each parent arranges childcare alone or with her partner, and "family support" in green color implies that parents organize childcare with the assistance of grandparents, relatives, or friends.

Table A.2: **Row labor market variables**

Variable	**mother**	**father**
Labor force		
childcare restrictions	0.738	0.967
Parents childcare	0.756	0.963
Family support	0.943	0.983
childcare services	0.925	0.987
Work		
childcare restrictions	0.574	0.846
Parents childcare	0.592	0.886
Family support	0.861	0.944
childcare services	0.853	0.945
Hours		
childcare restrictions	2888.0	4299.9
Parents childcare	3030.4	4101.8
Family support	3310.1	4097.9
childcare services	3169.0	4150.3
Full-time		
childcare restrictions	0.578	0.959
Parents childcare	0.699	0.963
Family support	0.782	0.975
childcare services	0.765	0.968

Notes: We report the row labor market outcomes in labor force rate, employment rate, full-time employment share and annual hours worked by gender.

Table A.3: **Estimated results for the short-run model**

	labor force	**work**	**hours**	**full-time**
mother	-.0542***	-.0769***	-1069.2***	-.2010***
	(.0079)	(.0115)	(85.7)	(.0139)
childcare restriction	.0048	-.0464***	33.5	.00002
	(.0090)	(.0170)	(116.3)	(.0112)
mother*childcare restriction	-.1740***	-.1920***	-392.2**	-.1810***
	(.0207)	(.0269)	(159.2)	(.0310)
Parents childcare	-.0112**	-.0316***	-164.5**	-.0050
	(.0051)	(.0090)	(70.2)	(.0069)
mother*parents childcare	-.1567***	-.2250***	-33.5	-.0681***
	(.01136)	(.0151)	(95.5)	(.0177)
family support	.0025	.0123	-123.4	.0071
	(.0053)	(.0096)	(82.4)	(.00735)
mother*family support	.0097	-.0179	225.8**	.0062
	(.0105)	(.0158)	(110.2)	(.0187)
working flexibility	-	-	-590.5***	-
	-	-	(52.1)	-
mother*working flexibility	-	-	347.4***	-
	-	-	(74.3)	-
age	.0239***	.0542***	35.3	.0032
	(.0050)	(.0060)	(35.6)	(.0060)
age^2	-.00027***	-.00061***	-.2579	.0000
	(.00005)	(.00007)	(.4287)	(.0000)
Spanish	.0518***	.0948***	1.5	.0633***
	(.0118)	(.0145)	(78.9)	(.0155)
secondary education	.0659***	.1741***	-91.3	-.0086
	(.0166)	(.0205)	(126.0)	(.0205)
tertiary education	.1192	.2870***	-251.1**	.0288
	(.0168)	(.0207)	(128.3)	(.0210)
post tertiary education	.1351***	.3059***	-244.1**	.0677***
	(.0184)	(.0230)	(150.6)	(.0240)
constant	.3236***	-.5997***	3602.2***	.7612***
	(.1033)	(.1247)	(735.9)	(.1283)
Number of observations	12,275	12,275	9,818	9,818
R-squared	.1297	.2040	.0872	.1402

Notes: We estimate OLS regressions using Eq. 1 and Eq. 2. Robust standard errors are in parentheses. All regressions control for regional (province) fixed effects and *, **, *** measures statistical significance at 10, 5 and 1 percent levels, respectively.

Table A.4: **Predicted labor market variables**

Variable	**mother**	**father**
Labor force		
childcare restrictions	0.673	0.978
Parents childcare	0.743	0.968
Family support	0.837	0.976
childcare services	0.924	0.978
Work		
childcare restrictions	0.481	0.867
Parents childcare	0.570	0.893
Family support	0.694	0.919
childcare services	0.849	0.926
Hours		
childcare restrictions	2822.2	4112.6
Parents childcare	3045.8	3993.0
Family support	3230.4	3987.9
childcare services	3247.6	4184.6
Full-time		
childcare restrictions	0.556	0.968
Parents childcare	0.684	0.966
Family support	0.733	0.974
childcare services	0.768	0.969
Hours with working flexibility		
childcare restrictions	2671.7	3747.0
Parents childcare	2895.3	3627.4
Family support	3079.9	3622.2
childcare services	3097.1	3818.9
Hours without working flexibility		
childcare restrictions	2914.8	4337.5
Parents childcare	3138.4	4217.9
Family support	3079.9	4212.822
childcare services	3340.2	4409.5

Notes: We report the predicted values of the labor market outcomes conditional on each of the childcare categories while holding all other explanatory variables constant in Table A.3 (predicted margins).

Table A.5: **Estimated results for the long-run model**

	labor force	**work**	**hours**	**full-time**
interruption 6 to 12 month	.0010	.0071	-139.77	-.0090
	(.0214)	(.023)	(116.30)	(.0227)
interruption 1 to 2 years	-.0293	-.0389	19.61	.0033
	(.297)	(.032)	(166,68)	(.0325)
interruption 2 to 3 years	-.0071	.0041	-358.22*	-.1694***
	(.037)	(.041)	(208,79)	(.0408)
interruption 3 to 5 years	.0066	-.0804**	-465.07**	-.2039***
	(0.037)	(.040)	(219,12)	(.0428)
interruption more than 5 years	-.1401***	-.1688***	-249.68*	-.1631***
	(.021)	(.023)	(140.39)	(.0274)
age	.2315***	.2025***	178.07	.0730*
	(.032)	(.034)	(191.45)	(.0374)
age^2	-.0023***	-.0020	-1.777	-.0006*
	(.000)	(.000)	(1.758)	(.0003)
Spanish	- .0131	-.0520	-624.28***	.0611
	(.052)	(.057)	(288.38)	(.0563)
secondary education	.0910***	.1521***	-159.48	.1201**
	(.032)	(.039)	(248.24)	(.0485)
tertiary education	.196	.2981***	-246.75	.2294***
	(.033)	(.053)	(252.27)	(.0493)
post tertiary education	.272***	.3609***	-124.34	.2040***
	(.048)	(.055)	(305.38)	(.0596)
constant	-5.024***	-4.482***	-162.87	-1.391
	(.871)	(.941)	(5182.84)	(1.013)
Number of observations	2,808	2,808	1,862	1,862
R-squared	.1711	.1655	.0186	0.0912

Notes: We estimate OLS regressions using Eq. 3. Robust standard errors are in parentheses. All regressions control for regional (province) fixed effects and report robust standard errors and *, **, *** measures statistical significance at 10, 5 and 1 percent levels, respectively.

Table A.6: **Predicted labor market variables for mothers between 45 to 60**

Variable	**Labor force**	**Work**	**Hours**	**Full-time**
Interruptions less than 6 month	0.766	0.698	3301,3	0.865
Interruptions 6 to 12 month	0.767	0.705	3161,5	0.856
Interruptions 1 to 2 years	0.737	0.659	3320,9	0.868
Interruptions 2 to 3 years	0.759	0.702	2943,1	0.695
Interruptions 3 to 5 years	0.773	0.618	2836,2	0.661
Interruptions more than 5	0.626	0.529	3051,6	0.702

Notes: We report the predicted values of the labor market outcomes conditional on each length of interruption while holding all other explanatory variables constant in Table A.5 (predicted margins).