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Longer School Schedules, Childcare and the Quality of Mothers' Employment

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1. Introduction

International policy and academic debates have increasingly emphasized the positive role of employment quality in personal well-being, social cohesion, and inclusive growth and development. Jobs with higher wages lead to greater household consumption, aggregate demand and economic growth, and they contribute to reducing the working poor. Similarly, jobs covered by formal contracts provide workers with better protection as they usually give them access to health services and different social security schemes (ILO, 2021). Nonetheless, about half of the world's workers remain poor or are vulnerable to slipping into poverty. Among them, in all regions of the world, women are overrepresented, as they work and earn less than their male counterparts and are more likely to participate in unpaid work and jobs without social protection (ILO, 2020; ILO, 2018). This is mirrored in the higher participation of women in informal employment (UN-Women, 2016), where jobs are of poorer quality reflected in terms of lower wages, shorter tenure and uncovered by social protection systems. Reducing gender gaps in job quality is a desirable objective because doing so would lead to higher growth rates, increased household welfare, reductions in poverty, and greater female empowerment (Heath & Jayachandran, 2017), as well as prevent further increases in gender gaps in case of recessions (Alon, Doepke, Manysheva & Tertilt, 2022; Alon, Coskun, Doepke, Koll & Tertilt, 2022; ILO, 2021).

Many women cannot access higher-quality jobs when they become mothers due to the time-intensive nature of childrearing and traditional gender roles, which often cause mothers to delay entry to or exit from the labor force. Recent empirical studies have shown that a "motherhood penalty" exists when mothers who exit the labor market are temporarily unable to catch up to the earned wages of women who were never mothers or never exited the market during their employment life (Kleven, Landais & Egholt Sogaard, 2019). A motherhood penalty also exists on better-quality jobs (Berniell et al., 2021). Well-designed childcare programs and primary school conditions (such as school schedules and the school calendar) can help make motherhood and work more compatible, allowing mothers to access better quality jobs and, therefore, reducing such penalties. This paper tests this hypothesis by analyzing the effects of the introduction and progressive extension of longer school days in Chilean primary schools on the job quality of mothers of primary school-aged children (ages 6 to 13 years). Our results on job quality extend previous evidence by Berthelon, Kruger & Oyarzún (2023), who analyzed the effects of the same reform on mothers' labor supply responses.

Effective public policies can help reduce the motherhood penalty and balance work and family life. The evidence from this vast literature has studied policies' effects on mothers' employment. For instance, flexible work schedules facilitate mothers' entry or re-entry into the labor market after childbirth (Chioda, 2016; Del Boca, 2002), and childcare and school access have led to larger maternal employment opportunities when children are in preschool and/or primary school.[1]

[1] See İlkkaracan et al. (2021); Berlinski & Galiani (2007); Berlinski, Galiani & McEwan (2011); Baker, Gruber & Milligan (2008); Lefebvre & Merrigan (2008); and Brilli, Del Boca & Pronzato (2016); Calderón (2014) for evidence on pre-school aged children. See Felfe, Lechner & Thiemann (2016); Martínez & Perticará (2017); Padilla-Romo & Cabrera-Hernández (2019); Contreras & Sepulveda (2016); Finseraas, Hardoy & Schøne (2017); and Berthelon, Kruger & Oyarzún (2023) for evidence on primary school-aged children.

Yet, the literature has given little attention to the effects of policies that balance work and family life on women's job quality or the likelihood of joining formal employment.[2] To the best of our knowledge, no previous studies on the impact of childcare or school access have analyzed non-wage dimensions of employment quality. As such, this study contributes to the growing literature and debate regarding policies that affect job quality and decent work (Findlay, Kalleberg & Warhurst, 2013; International Labour Office, 1999) and to the literature regarding motherhood and employment (Kleven, Landais & Egholt Sogaard, 2019; Berniell et al., 2021).

In this paper, we analyze a reform that gradually extended school schedules in Chilean primary schools. We exploit the quasi-experimental nature of the school reform roll-out to analyze the impact of childcare on the quality of mothers' jobs. Using a longitudinal dataset that contains rich information on employment characteristics, we construct several measures of work quality and employment conditions that are standard in the literature (UNECE, 2010; Muñoz de Bustillo et al., 2011). Broadly defined, job quality consists of three dimensions: earnings quality, labor market security, and work environment (Cazes, Hijzen & Saint-Martin 2015); with our data, we can construct measures that capture the first two. Combining plausibly exogenous changes in access to extended school schedules with a panel dataset of about 1,900 mothers, we estimated an individual fixed-effects model that controlled for individuals' unobserved heterogeneity, which is arguably an important determinant in employment decisions, and several municipality socio-economic indicators.

We found that greater access to childcare for primary school-aged children significantly and positively affected the quality of mothers' jobs: an increase in full-day school (hereafter, FDS) coverage of twenty-five percentage points—the equivalent of extending FDS coverage to all schools from observed 2015 levels—would lead to an increase in the likelihood of having a formal contract by 3.1 percent, and would decrease the likelihood of self-employment by 10 percent. We also found that the FDS policy had heterogeneous effects: among lower education mothers (high school degree or less), reaching full implementation of the policy would increase the likelihood of full-time jobs by 4.0 percent, of having a contract by 5.5 percent, and decrease the likelihood of being self-employed by 11.1 percent. Among higher-educated women (at least some college), we estimate an increase of 1.0 percent in wages and 3.7 percent in open-ended contracts. These results suggest that the FDS policy contributes to improving the quality of employment among mothers. These findings are also robust to possible confounding effects such as the (almost) simultaneous expansion of public access to childcare for preschool children, pre-existing trends in women's employment rates, and other socio-economic characteristics at the municipal level that may have been correlated with the variation in job quality and FDS.

Previous studies have found similar results for the FDS policy.[3] Our findings also relate to more recent works that analyzed the role of programs that keep school-aged students for longer periods under supervision on mothers' labor-market outcomes. Afterschool programs, school schedule-extension policies, and lowering school entry age have been found to affect mothers' employment and labor supply positively (Felfe, Lechner & Thiemann, 2016; Martínez & Perticará,

[2] There is a small literature that has evaluated the effect of social protection mechanisms, like unemployment insurance, on job quality (e.g., Nekoei and Weber, 2017; Van Ours and Vodopivec, 2008).

[3] Previous studies on the effects of the FDS reform on participation and employment decisions include Hernando (2009), Contreras and Sepulveda (2016), and Berthelon, Kruger & Oyarzún (2023). The latter study has a similar estimation strategy, but it focuses on FDS effects on mothers' labor supply (labor force participation, employment) and mothers' attachment to the labor market. None of these analyze job quality, as this paper does.

2017; Padilla-Romo & Cabrera-Hernández, 2019; Contreras & Sepulveda, 2016; Finseraas, Hardoy & Schøne, 2017; Berthelon, Kruger & Oyarzún, 2023), while shorter school schedules have reduced mothers' labor-market participation (Takaku, 2019). Our results are also relevant given the recent worldwide closing of schools during the COVID-19 pandemic, which disproportionally affected women's employment and increased gender inequalities (Dang & Nguyen, 2021; Alon et al., 2020; Collins et al., 2020; Del Boca et al., 2020; Reichelt et al., 2020; Hipp & Bünning, 2020; Palomino, Rodriguez & Sebastian, 2020).

Our findings provide important policy lessons for other countries that are considering or are in the process of implementing similar policies. In recent years, countries such as Colombia, Brazil, Uruguay, Peru, and Germany have implemented policies that increased school hours in at least some schools. In contrast, many states in the United States have reduced the total time children spend in school, and our study can provide lessons on the potential negative effects of such decisions (Anderson & Walker, 2015).

This paper is organized as follows: the next section describes the Chilean school system and the FDS reform implemented since 1997. We discuss our identification strategy and the empirical model in Section 3, followed by a section describing our data and variables. Section 5 presents our results, and Section 6 concludes.

2. The Chilean school system

During our period of analysis, three types of schools existed in the general education system in Chile,[4] based on schools' ability to select students and their funding schemes: (i) public schools—administered at the municipal level and funded by a per-student subsidy from the central government and from (optional) resources allocated by each municipality; (ii) *private subsidized (or voucher) schools*, which were privately owned, for-profit organizations that received the same per-student subsidy from the central government, but which could charge their students' additional fees;[5] and (iii) *private schools* that did not receive public funding and were allowed to set fees. Private and private subsidized schools can select their students, but public (municipal) schools cannot.[6]

Chile's education system is also characterized by family school choice, referred to as "open enrollment" in other countries. Families are not restricted to a specific geographic location or district in choosing publicly-funded schools because the per-student subsidy available to schools is independent of a family's residence. Families can enroll their children in the school of their choice, according to their preferences and financial capacity. Even though school choice is not legally bound to place of residence, empirical evidence has revealed that school proximity is an

[4] Chilean education consists of three cycles: pre-school (pre-kindergarten and kindergarten), general education (primary education, eight years and secondary education, four years), and higher education (universities and technical institutes). Only general education is mandatory, and the government has the mandate to offer public education from grades 1 through 12 for all. The government also provides subsidized pre-school and university enrollment to low-income families. We limited our description to general education.

[5] Fees charged to students are regulated, and the government's per-student subsidy is reduced as private fees increase.

[6] Recent reforms that began in 2018 will gradually change the funding scheme by 2020 and will mostly affect public subsidized (voucher) schools. As of 2018, schools that received public funds could not charge additional fees or select students. Schools that wished to continue to charge fees and select students began to operate as private schools and did not receive public funds. This reform occurred after our period of analysis.

important determinant in parents' choice of school, particularly for children of primary-school age (Chumacero, Gómez & Paredes, 2011).

The Full-Day School Reform

In 1997, Chile initiated large-scale educational reform that included an increase in instructional time without extending the academic year. The reform increased daily school schedules and became known as the Full-Day School (hereafter, FDS) reform.[7] FDS mandated that all primary and secondary schools that received public funds—whether public or privately subsidized—had to offer a full-day program by 2007 and 2010, respectively; the change to full-day schedules was to be implemented gradually within a school.[8] In primary schools—the focus of this paper—daily time spent at school increased by about 1.5 to 2 hours, representing an increase of approximately 35 percent.[9] Full-day first and second grade were not mandatory, yet most schools offered full days at these levels. The law did not apply to (fully) private schools, so we excluded them from our analysis.[10] By increasing the time children spent in school and under adult supervision, the FDS policy was an implicit childcare subsidy for school-aged children, which might reasonably be assumed to have impacted mothers' employment outcomes. This is a reasonable hypothesis because mothers of young children in Chile cite a lack of childcare arrangements as one of the main reasons for not working or seeking employment (Table 1).

[7] The reform is referred to as JEC in Chile, the Spanish acronym of its official name, *Jornada Escolar Completa*, approved as law No.19,532.

[8] Schools that switched to the FDS schedule did not have to change all grade levels at the same time. However, if a grade level did become full-day, all classrooms within that grade level had to adopt the FDS program. Additionally, all publicly funded schools created after 1997 had to initiate operations as full-day schools.

[9] For most schools this meant changing from a system of half-day shifts to one continuous full-day schedule. A typical half-day schedule was from 8:00 a.m. until 1:30 p.m., while a typical full-day schedule ran from 8:00 a.m. until 3:30 p.m. In Chile, the Ministry of Education requires that schools comply with a minimum number of pedagogical hours per subject, which allows schools to determine their daily schedules independently and in flexible ways so they can fulfill this requirement. We had no systematic information regarding actual school schedules (opening and closing times).

[10] During the period of analysis, less than 8 percent of primary-school enrollment in Chile was in fully private schools. Additionally, we excluded private schools from the analysis because we lacked systematic information regarding their schedules.

Table 1. Main Reason Mothers Did Not Participate in Labor Force

	Mothers whose youngest child was of:		
Reason	**Preschool age**	**Primary school age**	**Secondary school age**
Household chores	49%	63%	67%
Lack of childcare	42%	22%	6%
Not interested	1%	1%	3%
Other reasons	7%	14%	24%
Total	100%	100%	100%

Source: Authors' calculations using CASEN 2015. Notes: Includes mothers aged 25-55 who were inactive in the labor force. Preschool age: 0-5 years; primary-school age: 6-12 years; secondary school age: 13-18 years.

The law set a deadline for FDS implementation, and each school principal was able to decide the timing of entry into the full-day regime in a decentralized manner. In Chile, school districts are defined at the municipal level but, while public schools are under the oversight of municipal authorities, principals in the public system have gained increasing levels of autonomy (Núñez, Weinstein & Muñoz, 2010). In the private subsidized system, most schools operate without coordinating with each other (Elacqua et al., 2011).

To implement longer schedules, schools that followed the FDS regime received funds from the Ministry of Education (MINEDUC) to cover additional costs. The per-student subsidy was 40% higher for students in full-day schools, and schools could apply for infrastructure funds from MINEDUC to finance the construction of new buildings. When faced with excess demand for infrastructure funds, MINEDUC prioritized schools according to several criteria, one of which was the socio-economic or educational vulnerability of the school's students.[11,12] In Section 3 below, we discuss the role of this feature of the policy in our identification strategy.

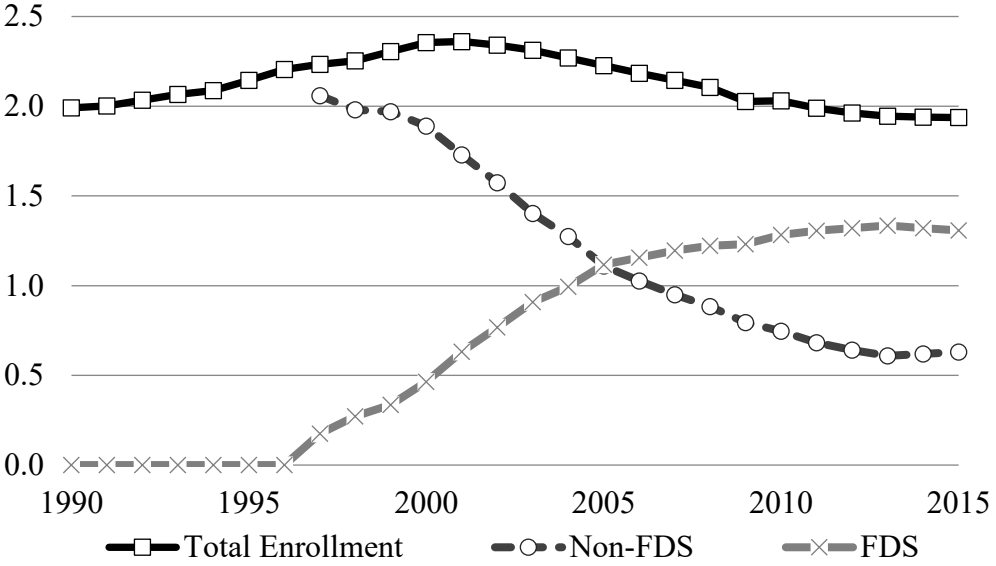
Figure 1 reveals the gradual trend toward FDS for primary-school enrollment. Only after nine years did enrollment in FDS surpass enrollment in half-day school schedules and, by 2015—eighteen years after the reform was implemented—FDS coverage had reached only 68 percent of total primary-school enrollment. In the first two years of the reform, schools with excess capacity (mostly in rural areas) entered the program because the cost to switch was relatively low; in subsequent years, schools entered the program gradually. By the first year of our analysis, just over 50 percent of primary schools had moved to full-day schedules. The implementation of the policy took place in a context in which the relative share of enrolment in publicly funded schools had not changed significantly over time.[13]

[11] Through the law, the Ministry of Education grants all schools authorization to operate under the full-day regime and also, through special competitive programs, provides funds to schools that require additional resources to implement the FDS schedule. The law also states that, in granting both authorizations and funds, the Ministry may use one or more of the following four selection criteria: a) socio-economic or educational vulnerability of the school's students; b) resources requested on a per-student basis; c) quality of the proposal with regard to technical, pedagogical, economic, and social specifications; and d) percentage of total funding that would be covered by the school's own administration.

[12] To our knowledge there are no publicly available data regarding schools' application for permits and/or funds. There is also no public information on the decision-making process regarding the allocation of funds by the Ministry.

[13] On average, 92.6 percent of children attended publicly funded schools between 1990 and 2015.

Figure 1. Primary School Enrollment by Length of School Day (1990-2015, millions of students)

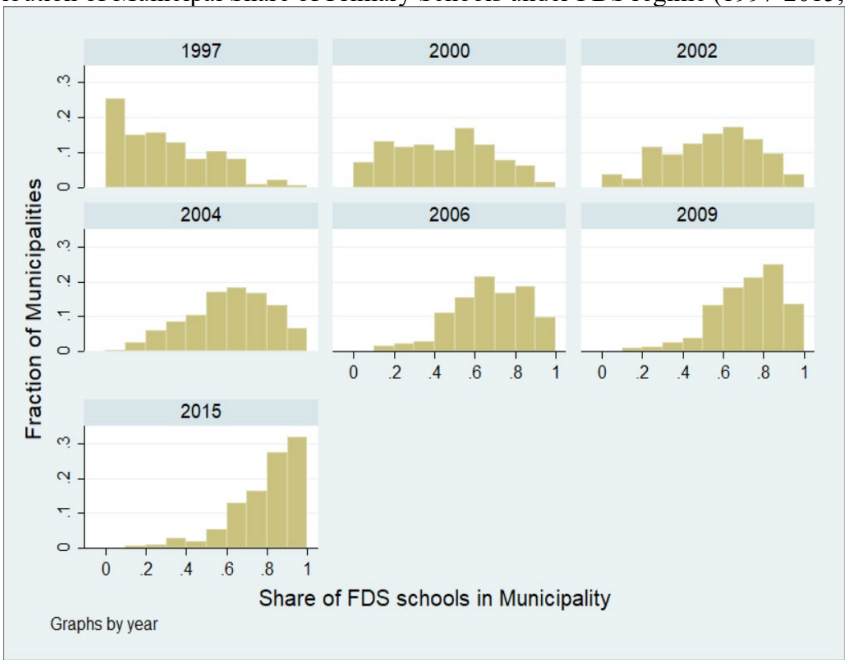


Source: Authors' calculations using School Directory/Administrative JEC data (MINEDUC).

As a result of the decentralized nature of decisions by school principals, the FDS program was taken up at different rates across Chilean administrative regions and municipalities (see Section 3), which is relevant for our identification strategy. Since its introduction in 1997, there has been a sustained increase in full-day school coverage, with significant variability across regions: there is an inverse relationship between the school-aged population and FDS implementation. The Metropolitan Region (where the capital Santiago is located) was home to more than one-third of primary-school students in 1997. Yet, the reform has advanced most slowly there, mainly because schools in this predominantly urban area faced space constraints or higher costs of expansion of their infrastructures. The fastest implementation occurred in less-populated regions with a larger share of rural areas and smaller urban centers.

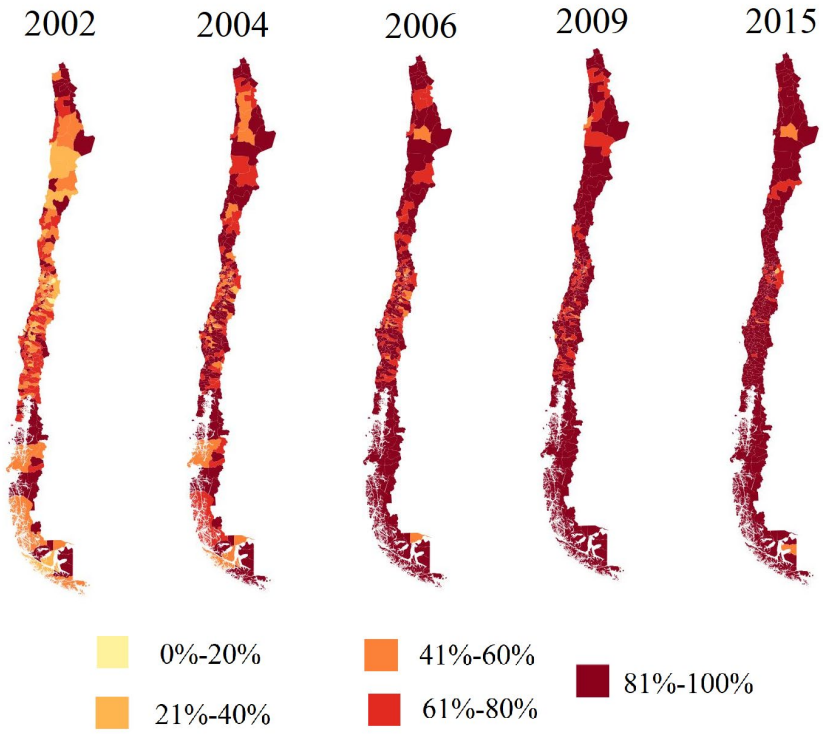
Given that there are 334 municipalities in Chile, in Figure 2, we report the distribution of municipal shares of primary schools under the FDS regime. As expected, we observed an increase over time in the share of municipalities that reached high levels of coverage. More importantly for our empirical strategy, it became clear that wide variation in FDS implementation existed in any given year, particularly for the years in which we computed our estimates. This can also be seen in Figure 3, which presents a map of the depth of FDS implementation across municipalities in 2002, 2004, 2006, 2009, and 2015 (the years in which our labor-market data were available). These descriptions reveal that the phase-in of the reform varied significantly in both time and place. Our empirical strategy took advantage of the quasi-experimental nature of the implementation of the reform.

Figure 2. Distribution of Municipal Share of Primary Schools under FDS regime (1997-2015, selected years)



Source: Authors' estimates based on School Directory/Administrative JEC data (MINEDUC).

Figure 3. Geographic Evolution of Municipal Share of Primary Schools under FDS Regime (2002-2015)



Source: Authors' estimates based on School Directory/Administrative JEC data (MINEDUC).

3. Identification Strategy and Estimation

We estimated a reduced-form, panel-data model of employment outcomes, controlling for individual fixed effects. The fixed effect allowed us to control for time-invariant, individual characteristics, including unobservable traits that may jointly have affected women's employment, fertility preferences, choice of residency, and choice of school. In our fixed-effects model, therefore, the effect of access to longer school schedules on job quality was identified through exogenous, within-individual changes in FDS access, under the assumption that preferences did not change over time. This assumption may not be true, and thus we attempted to control for changes in fertility preferences with variables that captured household composition and by restricting these variables to women who did not migrate.

Identification in our model depended upon the quasi-experimental nature of policy implementation—i.e., that FDS implementation was not correlated to women's employment outcomes. As indicated previously, this assumption is reasonable given the dynamics of the Chilean school system: FDS implementation resulted from the aggregation of highly independent school decisions. Additionally, Berthelon, Kruger & Oyarzún (2023) showed no evidence that FDS had been implemented in response to changes in local labor markets for women. Finally, our estimations controlled for pre-existing trends in women's employment rates and for other municipal socio-economic characteristics that could potentially have affected mothers' labor outcomes.

To estimate the FDS policy's effect on job quality, we restricted our sample to working women who were potentially affected by the policy and who did not change their municipality of residence. Thus, our sample was composed of mothers with at least one child of primary-school age in any of the survey rounds because they were concerned about childcare (see Table 1). Women in our sample were not necessarily affected by the FDS policy in every year they were surveyed—for instance, when a mother's older child was a preschooler in one survey round. Therefore, to identify the effect of FDS access on mothers' employment outcomes precisely, we interacted FDS availability in a given year with a dummy variable that equaled one if any of the mother's children was of primary-school age (ages 6 – 13) that year.

Conditional on being employed in year t, we estimated the following empirical model:

$$Q_{imrt} = \gamma_1 \mathrm{FDS}_{mrt} + \gamma_2(\mathrm{FDS}_{mrt} \times PSAge_{imrt}) + \gamma_3 PSAge_{imrt} + X_{imrt}\beta + M_{mt}\mu + \tau_{rt} + \delta_t D_{mr} + \alpha_i + \epsilon_{imrt} \quad (1)$$

where the dependent variable Q_{imrt} represented an indicator job quality (variables are described below in section 4) for woman i living in municipality m and region r in year t. The policy variable of interest, FDS_{mrt}, measured the share of full-day primary schools in municipality m and region r in year t.[14] $PSAge_{imrt}$ was a dummy variable that equaled 1 if any child was of primary-school age (6-13 years) in year t, and 0 otherwise. The effect of the FDS policy was γ_1 when there were no children of primary school age and $\gamma_1 + \gamma_2$ when there was at least one child in primary school. If the channel through which the policy affects mothers' employment was an implicit childcare

[14] Our data also allowed us to measure total enrollment under the FDS program. However, we believe that parental choice was affected by the availability of FDS rather than by aggregated municipality enrollment because parents observed the proximity of an FDS but not aggregated enrollment.

subsidy for primary school children, then we would have expected that FDS access would not affect mothers without children of primary school age, i.e., $\gamma_1 = 0$. Our parameter of interest was γ_2, as it captured the marginal effect of the policy on mothers when they were potentially affected by it; we reported this estimate in our results. As the FDS variable is constructed by aggregating school decisions within municipalities, identification in Equation 1 comes from the interaction of exogenous variation in municipal FDS availability and exogenous timing of the age of children, which determined the timing of policy exposure.[15] Because we did not know whether mother *i*'s child attended a school offering FDS, γ_2 could be interpreted as an intention-to-treat (ITT) effect. For this reason, the estimates shown below actually represent a lower bound of the effect of the treatment on the treated (impact of having a child attending a full-day school with respect to having a child in a half-day primary school).

We also controlled for time-varying individual characteristics in vector X_{imrt} and for municipality-level characteristics, including time-varying labor market conditions, in vector M_{mrt}. We included an individual-level fixed effect, α_i, which allowed us to control for individual unobserved heterogeneity and region-time fixed effects, τ_{rt}, to control for regional trends.

Another concern was the possibility that FDS was more quickly implemented in municipalities with higher labor-force participation. Therefore, we controlled for pre-existing trends in the labor market by interacting year-fixed effects (δ_t) with a dummy variable that defined a municipality as "low" LFP if its LFP rate in 2000 was below the median (D_{mr}). These interaction terms cleansed the estimated FDS effect of any differences in trends in labor-force participation by women that may have been in place before the first EPS survey (2002). Finally, ϵ_{imrt} was an idiosyncratic error term.

Threats to Identification

A first challenge to identification was associated with the possible confounding effect of the expansion of access to publicly provided childcare for preschool children, which began in 2006. We addressed this concern by controlling for the presence of children of preschool age after 2005. A second possible threat was related to endogeneity issues underlying the choices of school and location. In the Chilean education system, parents are not geographically limited in their choice of school, so the availability of FDS in the municipality of residence does not necessarily reflect the parental choice. However, previous research in Chile has shown that most children of primary-school age attend schools in their municipality (Chumacero, Gómez & Paredes, 2011; Schneider, Elacqua & Buckley, 2006).[16] Furthermore, an aggregated measure of FDS access was exogenous to families' residence as long as families did not decide where to live based on access to FDS schools. Berthelon, Kruger & Oyarzún (2023) analyzed migration decisions by families and found that their choice of the municipality of residence was uncorrelated with access to FDS schools. From their work, and nationwide data on migration around the beginning of the policy, i.e., 1997, we concluded that the availability of FDS at the municipal level should be exogenous to family

[15] A possible threat to this identification strategy would be increased fertility as a result of the policy. We estimated regressions of fertility on FDS access and individual and local characteristics and found no effect of the FDS policy on fertility. Results are available upon request to the authors.

[16] In 2009, approximately 11 percent of 4th-grade students went to school in a municipality different from their place of residence (statistics from the Chilean Agencia de Calidad de la Educación, https://www.agenciaeducacion.cl/home).

decisions related to the municipality of residence.[17] In our data, 79.2 percent of women with children of primary-school age did not change their municipality of residence during 2002-2015.

Another concern regarding identification was the non-random nature of the allocation of FDS funding and, more specifically, whether funding could be correlated with mothers' employment outcomes. As indicated above, schools that adopted the policy could apply for infrastructure funds, which were targeted to more vulnerable schools, potentially biasing the effects of FDS. For example, if mothers with children in schools with higher poverty levels had lower-quality jobs, then examining the effect of FDS policy might capture spurious correlations between mothers' employment and the policy. We addressed this possibility in several ways: first, we included a control for pre-existing trends in municipal labor-force participation rates for women and, second, we included municipality characteristics—poverty rates, women's participation rates, average income, etc.—as control variables in all regressions. Furthermore, as discussed above, the decentralized nature of decisions in the Chilean school system made it likely that FDS funding decisions followed a quasi-experimental design.

4. Data and Variables

Our main source of information was Chile's Social Protection Survey (hereafter, EPS for its Spanish acronym, *Encuesta de Proteccion Social*). The EPS was administered in several rounds (2002, 2004, 2006, 2009, and 2015) and collected detailed information regarding respondents' current labor status, job characteristics, and other socio-economic variables of the respondent and household members.[18] From this data source, we obtained individual information for our dependent variables on job quality (Q_{imt}) and mothers' socio-economic characteristics (X_{imrt}). From the EPS data, we could construct an unbalanced panel of about 1,928 women surveyed in at least two years in which the instrument was used. Detailed information is provided in the Online Appendix regarding the panel structure. Our panel included 654 women who appeared twice, 679 women who appeared three times, 586 women who appeared in all but one round, and 130 women who appeared all five times. Regarding attrition, technical reports by the agency that collected the data suggested that attrition was not systematically correlated to observable characteristics (Ministerio del Trabajo, 2016). We also provide an analysis of attrition in the Online Appendix.

We restricted our sample to working women who were potentially affected by the FDS policy throughout the surveyed period—i.e., mothers who had at least one child in primary school during the period. We excluded women who were never mothers during the period, and mothers whose youngest child reached age 19. With our selection criteria, women could enter and exit our sample over time as children aged.

[17] Rodríguez (2019) provides suggestive evidence that the policy has not likely affected migration patterns. Using 1992 and 2002 census data (i.e., before and after the reform was implemented) shows that the migration rates across regions and municipalities, in the five-year prior to 2002 and 1992 censuses (i.e., between 1997 and 2002, and between 1987 and 1992, respectively) were fairly low and similar. Therefore, suggesting no significant changes in internal migration patterns before and after the FDS policy was implemented.

[18] Another round of the survey was conducted in 2012. The Ministry of Labor deemed it "incomplete," however, and does not recommend its use. Therefore, we did not include it in our analysis (Ministerio del Trabajo y Previsión Social, 2015).

Measures of Job Quality Outcomes

We adopted several measures of job quality and formality that have been widely accepted in the literature: hourly wage (in logs);[19] categorical variables for whether the job was full-time; the presence of a contract; whether the job was open-ended and whether the worker was self-employed or a business owner. Our sample only includes women who were employed; therefore, for instance, our full-time job variable takes the value of 0 at time *t* when women worked part-time at time *t*, and 1 when they worked full-time. All other outcome variables were constructed similarly.

Other Control Variables

We included measures of women's individual characteristics that may have affected decisions to participate in the labor market as well as women's employment outcomes: years of education, age and age squared as proxies for experience, and family demographics (number of children of preschool, primary, and secondary-school or university age). The individual fixed effects of our estimates controlled for time-invariant unobservable characteristics that could be related to work preferences, including women's decisions to enter the labor force, preferred jobs, or fertility decisions, if they did not change over time.

In addition, Chile's National Household Surveys (CASENs) provided time-varying municipal-level variables (vectors M_{mrt} and D_{mr} in equation (1)): average adult educational attainment; poverty rate; percentage of rural population; women's and men's labor-force-participation rates; and women's and men's employment rates.

Defining Full-Day School (FDS) Access

We used administrative data from the Ministry of Education to construct a measure of FDS access at the municipal level.[20] As previously discussed, one feature of the FDS program was that it did not require simultaneous implementation at all grade levels (or in any specific order). It only required that, if a school implemented FDS at a specific grade-level, all students in that grade-level had to be included. In this context, we defined a school as full-day if all primary-school grade-levels at the school functioned as FDS (some schools did not offer all eight grade-levels).[21] We then aggregated this information at the municipal level to construct the share of FDS in a municipality in a given year.

Although full-day schedules are not mandatory for 1st and 2nd grade, we included them in our measure of access to FDS on the premise that parents chose a school they expected their child to attend for several years. Furthermore, because most primary school enrollments were in grades

[19] Hourly wages are expressed in Chilean pesos (in 2015 prices) per hour worked. We include only mothers that work. We also drop from the wage regressions observations for women that work but that do not report salary or compensations (10 observations in our baseline estimates).

[20] We obtained these data through the Open Data platform of the Ministry of Education website: http://datosabiertos.mineduc.cl.

[21] We also constructed FDS indicators with different thresholds (i) at least one grade, (ii) 50% of all grade-levels, (iii) 75% of all grades, and a variable defined as a fraction of enrollment under FDS. We found that for the 75% FDS variable, results remained unchanged and even full-time employment was positively affected by the policy. For the 50% and any grade in FDS variables, we found similar point estimates but not statistically significant. These results point out the importance of the intensity in the policy implementation, with mothers being affected only when they have access to schools with large coverage of FDS grades. Results are available upon request to the authors.

3 through 8, access to FDS in 1st through 8th grades was strongly correlated with FDS access in 3rd through 8th grades (simple correlation = 0.99).[22]

Descriptive Statistics

Table 2 reports summary statistics for all variables in our sample, for each year, and for the period's average. We observe that over the 2002-2015 period, the hourly wage rate constantly increased, from 947 to 2.054 Chilean Pesos in 2015 prices. In addition, of all employed mothers, 87 percent had full-time employment, although full-time employment decreased over time from 89 percent in 2002 to 81 percent in 2015. Also, 70 percent had a formal contractual arrangement, 81 percent had a permanent job (either with or without a contract), and 19 percent were self-employed or owned their business during the period.

Some of the differences between 2002 and later years were the result of the sample framework of the ELPI in 2002. That year, the survey was designed to represent the population contributing to the country's pension system. Later rounds of the survey were designed to represent the entire adult population. This change explains the large differences between 2002 and 2004.[23]

Regarding our policy variable of interest, women in our sample lived in municipalities where, on average, 55 percent of primary schools were defined as FDS schools. Coverage increased during the 2002-2015 period: average access to FDS increased from 39 percent to 76 percent Also, women's average age was almost 37 years in our sample, the average education attainment was 10.6 years, and the average poverty rate in their municipalities of residence was 17 percent.

[22] We would have liked to estimate regressions that tested whether mothers anticipated future levels of FDS coverage. However, in the first year of our data, the reform had already been in place for several years (average coverage was 42 percent), so that approach was not feasible. Contreras & Sepulveda (2016) were able to analyze this question given the nature of their data, and they found that women's employment decisions did not anticipate the reform.

[23] Our results remain unchanged if we exclude 2002 from the estimations.

Table 2. Summary statistics: mean and standard deviations (2002-2015)

	2002 n= 1407		2004 n=1365		2006 n=1463		2009 n=1343		2015 n=454		Average 2002-2015 n=6491	
Variable	**Mean**	**Sd.**	**Mean**	**Sd.**	**Mean**	**Sd.**	**Mean**	**Sd.**	**Mean**	**Sd.**	**Mean**	**Sd.**
Labor Market Outcomes												
Wage (Chilean Pesos/hour)	966	1404	984	811	1253	2420	1524	1470	2039	1647	1245	1676
Full-Time Job	0.90	0.30	0.89	0.31	0.86	0.34	0.86	0.35	0.81	0.40	0.87	0.33
Contractual status	0.76	0.43	0.69	0.46	0.67	0.47	0.73	0.44	0.67	0.47	0.71	0.45
Job is Permanent	0.85	0.36	0.79	0.41	0.77	0.42	0.86	0.34	0.85	0.36	0.82	0.38
Self-employed/Employer	0.16	0.36	0.14	0.34	0.20	0.40	0.24	0.43	0.22	0.42	0.19	0.39
Full-Day Schooling												
Share of FDS schools in municipality	0.19	0.17	0.22	0.18	0.23	0.18	0.26	0.18	0.36	0.16	0.23	0.18
Individual and household variables												
Years of schooling	10.47	4.23	11.27	3.28	11.29	3.35	11.20	3.24	11.69	3.42	11.10	3.56
Age	35.73	7.13	37.56	7.54	39.36	7.62	40.80	7.37	43.76	6.05	38.76	7.68
No. Children aged 0-5 in household	0.46	0.60	0.33	0.53	0.21	0.44	0.19	0.43	0.11	0.35	0.28	0.51
No. Children aged 6-13 in household	1.00	0.73	0.86	0.72	0.78	0.72	0.72	0.70	0.62	0.68	0.82	0.73
No. Children aged 14-18 in household	0.33	0.59	0.54	0.71	0.63	0.71	0.69	0.66	0.79	0.62	0.57	0.68
No. Children aged 18+ in household	0.21	0.54	0.33	0.66	0.48	0.79	0.61	0.91	0.50	0.70	0.41	0.75
Married (or partner)	0.62	0.49	0.59	0.49	0.58	0.49	0.57	0.50	0.48	0.50	0.58	0.49
Number of household members	4.78	1.72	5.19	1.90	5.57	2.08	5.93	2.30	5.44	1.95	5.37	2.04
Municipal variables												
Average school attainment	9.96	1.20	10.02	1.18	10.02	1.14	10.15	1.10	10.92	0.92	10.10	1.16
Poverty rate	0.19	0.07	0.17	0.07	0.14	0.06	0.16	0.07	0.12	0.06	0.16	0.07
Women's employment rate	0.88	0.04	0.88	0.03	0.90	0.04	0.87	0.04	0.91	0.03	0.88	0.04
Men's employment rate	0.91	0.03	0.93	0.02	0.94	0.02	0.91	0.03	0.93	0.03	0.92	0.03
Women's LFP rate	0.41	0.07	0.42	0.07	0.43	0.07	0.42	0.06	0.47	0.06	0.42	0.07
Men's LFP rate	0.74	0.04	0.73	0.04	0.73	0.04	0.70	0.05	0.71	0.05	0.72	0.05

Source: Authors' estimates based on EPS panel (2002-2015), CASEN surveys, and administrative data from the Ministry of Education.

Notes: N.A.: information not available in survey. The sample included working women who had primary school-aged children when they were surveyed, in at least one round of the survey. The share of FDS Schools at the municipality level is the fraction of schools with 100% of their grade levels under the FDS regime. Hourly wages are expressed in Chilean pesos (in 2015 prices) per hour. Average exchange rate during the period: 597 CLP/US$1.

5. Results

We estimated Equation 1 for each of our job quality variables. Table 3 presents baseline results of the ITT effects of FDS access. [24] We found that greater access to FDS significantly affects two of our quality indicators: it increases mother's likelihood of having a formal job (i.e., a job with a contract) and reduces that of working as a self-employed/employer. Although not statistically significant, we also observed positive point estimates for wages and full-time employment. To put our point estimates in a relevant context, instead of considering a movement from zero to full implementation, we considered an increase of about twenty-five percentage points in our FDS variable, which was equivalent to reaching full implementation at the national level from the 2015 level. Such an increase in access to full-day schools would lead to a predicted increase in the probability of having a formal contract of 2 percentage points or a 3.1 percent increase.[25] The same increase in FDS coverage–by 25 percentage points—would have decreased the likelihood of self-employment by 2 percentage points, which corresponds to a decrease of 10 percent.[26]

Table 3. Effect of full-day schedules on quality of mothers' employment (2002-2015)

	Employment Quality				
VARIABLES	Wage (1)	Full-Time (2)	Contract (3)	Permanent (4)	Self-Emp./ Employer (5)
Child in Primary School x Fraction FDS schools in municipality	0.0644	0.0790	0.0860**	-0.0015	-0.0735*
	(0.0920)	(0.0513)	(0.0416)	(0.0594)	(0.0421)
Observations	5,774	6,032	6,032	6,032	6,032
R-squared	0.314	0.031	0.046	0.055	0.045
Number of women in panel	1,918	1,928	1,928	1,928	1,928
Mean of Dependent Variable	6.874	0.867	0.697	0.809	0.190
Other control variables	Yes	Yes	Yes	Yes	Yes
Individual fixed effects	Yes	Yes	Yes	Yes	Yes

Source: Authors' estimates based on the EPS surveys for 2002, 2004, 2006, 2009, and 2015.
Notes: The sample included working women who had primary school-aged children when they were surveyed, in at least one round of the survey. The share of FDS was the fraction of schools with 100% of their grade levels under the FDS regime. Robust standard errors, clustered at the municipal level, in parentheses. *** , ** , * reflect statistical significance at 1%, 5% and 10% levels, respectively. Control variables not shown: youngest child in primary school, fraction of FDS schools in municipality, mother's years of education, mother's age and age squared, presence of children aged 0-5, 6-13, 14-18 and 18+ in household, mother is married/has a partner, number of people living in household, municipal average school attainment, municipal rates of poverty, female and male employment, female and male labor force participation, region-year fixed-effects, interactions between a categorical variable for municipal female labor force participation rate in 2000 and year fixed-effects, and individual fixed-effects.

[24] For simplicity, we reported results for our variable of interest. Tables with all control variables are available upon request.
[25] The marginal effect reported for women with children in primary school was estimated relative to the average likelihood of having a contract for working women, and it was obtained by multiplying the point estimate (0.086) by 0.25 and dividing it by the average of the dependent variable (0.697).
[26] Similar results are observed when the sample is expanded to include women that do not work. See Online Appendix.

Our main results suggest that the greater access to childcare provided by the FDS policy in primary schools improved mothers' likelihood of entering better-quality jobs. Mothers with children in primary schools and with greater access to FDS schools were more likely to hold jobs with a higher degree of formality (contract) and to rely less on self-employment.[27] One potential explanation, consistent with our results, is that if children spend more hours in school under adult care, mothers can participate more intensively in the formal labor market (which typically is more centered around full-time jobs) and, thus, rely less on (typically) informal self-employment.

Because the labor market is very rigid in Chile and part-time employment is uncommon (Rau, 2010), the availability of full-day schools reduced the need for childcare arrangements outside schools and extended the feasible set of jobs that mothers could access (formal jobs, which are typically full-time jobs). Therefore, our results point toward a mechanism through which the policy lowered the cost of childcare and facilitated an increase in formal jobs (which were associated with higher wages and full-time employment) and a decrease in self-employment.

5.1 Mechanisms

Did FDS reduce the opportunity cost of working for mothers?

To explore whether the policy affected mothers' employment outcomes through an implicit subsidy to the cost of childcare, we estimated Equation 1 for groups that would respond differently to access to childcare: women and men without children of primary-school age (i.e., either mothers or fathers of older children or those who were not parents), and fathers.

The availability of full-day primary schools should not have affected women without children because they did not benefit from longer school schedules. Also, in general, we did not expect large effects for men because women are the primary care-takers of children in Chile and men have a stronger attachment to the labor force than women. However, it is possible that fathers' labor-market outcomes would change in response to the policy because mothers' employment in better jobs could also facilitate more leisure among men or because women's employment may have increased the need for fathers to dedicate time to household work and childrearing.

Results for these three groups—women, men without children, and fathers—are found in Panels A, B and C of Table 4. We find that, with the exception of permanent employment for men without children, the FDS policy did not affect the employment quality of these three groups.

We also estimated whether the effects differed for mothers with and without older children and adults other than their partners (such as grandparents) in the household. If FDS provides childcare, then mothers living in households where other family members provide childcare for younger children should be less affected by the policy. Results are reported in Table 5. As expected, we found that mothers who lived with other adults were less sensitive to the FDS policy (Panel A of Table 5). In turn, mothers who did not live in a household with other adults (Panel B) are affected by the policy, as they are less likely to be self-employed.

[27] We also estimated our baseline regressions excluding municipalities in the Santiago, Valparaiso, and Concepcion metropolitan areas. We find that the FDS policy has a positive and statistically significant effect on full-time employment, while it has a positive but no longer statistically significant impact on having a contract and being self-employed.

Table 4. Effect of Full-Day Schedules on Quality of Mothers' Employment: Women and Men Without Children, and Fathers (2002-2015)

	Employment Quality				
VARIABLES	Wage (1)	Full-Time (2)	Contract (3)	Permanent (4)	Self-Emp. - Employer (5)
A. Women without children					
Fraction FDS schools in municipality	-0.199	0.0455	-0.0079	-0.001	0.103
	(0.276)	(0.128)	(0.142)	(0.184)	(0.167)
Observations	1,809	1,921	1,921	1,921	1,921
R-squared	0.379	0.093	0.079	0.097	0.090
Number of women in panel	680	700	700	700	700
Mean of Dependent Variable	6.998	0.884	0.741	0.857	0.167
B. Men without children					
Fraction FDS schools in municipality	-0.0651	0.0944	0.141	0.271**	0.0712
	(0.207)	(0.0969)	(0.144)	(0.128)	(0.121)
Observations	3,918	4,103	4,103	4,103	4,103
R-squared	0.334	0.039	0.051	0.079	0.033
Number of women in panel	1,404	1,430	1,430	1,430	1,430
Mean of Dependent Variable	6.902	0.927	0.647	0.766	0.304
C. Fathers with children of primary school age					
Child in Primary School x Fraction FDS schools in municipality	-0.0134	0.0178	0.0023	0.0043	-0.0240
	(0.0896)	(0.0259)	(0.0440)	(0.0385)	(0.0479)
Observations	8,176	8,452	8,452	8,452	8,452
R-squared	0.301	0.027	0.046	0.055	0.033
Number of men in panel	2,571	2,590	2,590	2,590	2,590
Mean of Dependent Variable	7.067	0.968	0.717	0.832	0.305

Source: Authors' estimates based on the EPS survey, years 2002, 2004, 2006, 2009 and 2015.

Notes: Panels A and B include women or men who did not have primary school-aged children when they were surveyed; panel C includes fathers of children that were in primary school at least one year during the panel. The fraction of FDS schools is the share of schools with 100% of their grade levels under the FDS regime. Robust standard errors, clustered at the municipal level, in parentheses. *** , ** , * reflect statistical significance at 1%, 5% and 10% levels, respectively. Control variables not shown: mother's years of education, mother's age and age squared, presence of children aged 0-5, 6-13, 14-18 and 18+ in household, mother is married/has a partner, number of people living in household, municipal average school attainment, municipal rates of poverty, female and male employment, female and male labor force participation, region-year fixed-effects, interactions between a categorical variable for municipal female labor force participation rate in 2000 and year fixed-effects, and individual fixed-effects.

Table 5. Effect of Full-Day Schedules on Quality of Mothers' Employment: With and without Other Adults in Household (2002-2015)

	Employment Quality				
	Wage	Full-Time	Contract	Permanent	Self-Emp. - Employer
VARIABLES	(1)	(2)	(3)	(4)	(5)
A. Mothers with other adults in household					
Child in Primary School x Fraction FDS schools in municipality	0.1000	0.0994	0.129	0.0009	0.004
	(0.138)	(0.0805)	(0.0879)	(0.114)	(0.0875)
Observations	2,783	2,898	2,898	2,898	2,898
R-squared	0.286	0.091	0.085	0.091	0.090
Number of women in panel	1,263	1,288	1,288	1,288	1,288
Mean of Dependent Variable	6.896	0.860	0.676	0.801	0.214
B. Mothers without other adults in household					
Child in Primary School x Fraction FDS schools in municipality	-0.0455	0.0724	0.0825	0.0307	-0.157*
	(0.134)	(0.0755)	(0.0835)	(0.0920)	(0.0884)
Observations	2,957	3,099	3,099	3,099	3,099
R-squared	0.352	0.046	0.077	0.069	0.088
Number of women in panel	1,273	1,305	1,305	1,305	1,305
Mean of Dependent Variable	6.852	0.873	0.718	0.816	0.167

Source: Authors' estimates based on data from the EPS surveys for 2002, 2004, 2006, 2009, and 2015.
Notes: Panels A and B include mothers that live in households with and without other adults (children aged 19 or older or grandparents), respectively (in addition to spouse/partner, if any). The fraction of FDS Schools is the share of schools with 100% of their grade levels under the FDS regime. Robust standard errors, clustered at the municipal level, in parentheses. ***, **, * reflect statistical significance at 1%, 5% and 10% levels, respectively. Variables not shown: youngest child in primary school, fraction of FDS Schools in municipality, mother's years of education, mother's age and age squared, presence of children aged 0-5, 6-13, 14-18 and 18+ in household, municipal average school attainment, municipal rates of poverty, rural population, women's and men's employment, women's and men's labor force participation, region-year fixed-effects, interactions between a categorical variable for municipal women's labor force participation rate in 2000 and year fixed-effects, and individual fixed-effects.

FDS Reform and Mother's Investments in Education

The FDS reform may also affect job quality through an indirect channel: mothers' investments in education. By subsidizing the cost of childcare, the FDS reform could affect mothers' decisions regarding educational investments because the policy lowered the cost of investing in education for mothers of children affected by the policy. Mothers may have deferred entering the job market and enrolling in educational institutions because their children were under (subsidized) formal childcare for most of the day. In turn, greater investments in education could facilitate access to jobs of better quality once mothers entered the labor market.

Our data allowed us to analyze the effect of the FDS policy on two measures of formal education: an indicator variable that captured whether the mother currently (at the time of the survey) attended an education establishment (primary, secondary, or tertiary) and years of

education completed. The results are reported in Table 6. We found that the FDS policy did not affect maternal decisions regarding formal education for both measures.

Table 6. Effect of Full-Day Schedules on Mothers' Educational Decisions (2002-2015)

	Dependent variable:	
	Years of Education Completed	Attends Education Establishment
VARIABLES	(1)	(2)
Child in Primary School x Fraction of FDS Schools in municipality	-0.365	-0.0191
	(0.284)	(0.0228)
Observations	11,344	11,413
R-squared	0.044	0.019
Number of women in panel	2,906	2,906

Source: Authors' estimates based on data from the EPS surveys for 2002, 2004, 2006, 2009, and 2015.
Notes: The sample included women who had primary school-aged children when they were surveyed, in at least one round of the survey. The fraction of FDS Schools is the share of schools with 100% of their grade levels under the FDS regime. Robust standard errors, clustered at the municipal level, in parentheses. ***, **, * reflect statistical significance at 1%, 5% and 10% levels, respectively. Variables not shown: youngest child in primary school, fraction of FDS Schools in municipality, mother's years of education, mother's age and age squared, presence of children aged 0-5, 6-13, 14-18 and 18+ in household, municipal average school attainment, municipal rates of poverty, rural population, women's and men's employment, women's and men's labor force participation, region-year fixed-effects, interactions between a categorical variable for municipal women's labor force participation rate in 2000 and year fixed-effects, and individual fixed-effects.

5.2 Possible Confounding Effects

We identified three possible threats to identification: endogeneity in location and school choices, non-randomness in FDS fund allocation across municipalities, and preschool childcare expansion. We addressed the first concern by building on past evidence reported in the literature. For the second, in all our estimations we controlled for pre-existing trends in women's municipal labor participation as well as for various municipality characteristics. Below we explain how we addressed the third challenge.

FDS Policy and Preschool Childcare Expansion in Chile

The Chilean government began expanding public access to childcare in 2006, a program that has continued to increase access to publicly funded daycare for lower-income children aged 3 months through 4 years. One potential concern of this expansion was that its effect on mothers' employment outcomes may confound the effects of the FDS policy. To control for this possibility, we estimated model 1 by including a categorical variable equal to one if the woman had a child of preschool age after 2005. This variable was intended to control for the potential effect that the expansion of childcare facilities had on labor-market outcomes for women with children in that age group. The results reported in Table 7 show that the overall effect of the FDS policy on mothers

with children of primary-school age was basically unchanged, indicating that our results for the FDS policy were not driven by increasing access to preschool programs.[28]

Table 7. Effect of Full-Day Schedules on Quality of Mothers' Employment and Daycare Policies (2002-2015). Controlling for National Daycare Policy

	Employment Quality				
VARIABLES	Wage (1)	Full-Time (2)	Contract (3)	Permanent (4)	Self-Emp. - Employer (5)
Child in Primary School x Fraction FDS schools in municipality	0.0674	0.0805	0.0837**	-0.0022	-0.0744*
	(0.0921)	(0.0513)	(0.0415)	(0.0593)	(0.0424)
Daycare policy	0.0442	0.0167	-0.0255	-0.00706	-0.00999
	(0.0371)	(0.0237)	(0.0272)	(0.0273)	(0.0240)
Observations	5,774	6,032	6,032	6,032	6,032
R-squared	0.314	0.031	0.046	0.055	0.045
Number of women in panel	1,918	1,928	1,928	1,928	1,928
Mean of Dependent Variable	6.874	0.867	0.697	0.809	0.190

Source: Authors' estimates based on data from the EPS surveys for 2002, 2004, 2006, 2009, and 2015.
Notes: The sample included working women who had primary school-aged children when they were surveyed, in at least one round of the survey. The fraction of FDS Schools is the share of schools with 100% of their grade levels under the FDS regime. Daycare policy was a categorical variable equal to one if the woman had a child of preschool age after 2005. Robust standard errors, clustered at the municipal level, in parentheses. ***, **, * reflect statistical significance at 1%, 5% and 10% levels, respectively. Variables not shown: youngest child in primary school, fraction of FDS Schools in municipality, mother's years of education, mother's age and age squared, presence of children aged 0-5, 6-13, 14-18 and 18+ in household, municipal average school attainment, municipal rates of poverty, rural population, women's and men's employment, women's and men's labor force participation, region-year fixed-effects, interactions between a categorical variable for municipal women's labor force participation rate in 2000 and year fixed-effects, and individual fixed-effects.

5.3 Heterogeneous effects by income level

We studied whether the policy's effects varied with a mother's income. We proxied a woman's permanent income with her education level in the first year she was interviewed, defining two groups: low-education mothers were those who had completed twelve or fewer years of schooling (equivalent to a high school diploma or less), and high education mothers were those who had completed thirteen years of schooling or more (equivalent to having ever completed at least one year of a university or college education). We present results for low- vs. high-education mothers in Panels A and B of Table 8, respectively.

We found that the effects of the policy differed depending on the mother's educational level. For low-education women, greater access to FDS increased the likelihood of having a full-time job and a contract, and decreased the likelihood of being self-employed. Reaching full implementation of the policy, i.e., an increase of twenty-five percentage points in access to FDS schools, would

[28] We also estimated the regressions in Table 7, excluding mothers when they were affected by the national childcare policy; point estimates and significance did not change. Results are available upon request.

increase the likelihood of full-time jobs by 4.0 percent, of having a contract by 5.5 percent, and decrease the probability of being self-employed by 11.1 percent. For the high-education group, we find an increase of 1.0 percent in wages and of 3.7 percent in open-ended contracts.

Table 8. Effect of Full-Day Schedules on Quality of Mothers' Employment: Women by Education Level (2002-2015)

	Employment Quality				
VARIABLES	Wage (1)	Full-Time (2)	Contract (3)	Permanent (4)	Self-Emp. - Employer (5)
	A. Low-education mothers				
Child in Primary School x Fraction FDS schools in municipality	-0.0306	0.134**	0.142**	-0.0080	-0.0922*
	(0.119)	(0.0659)	(0.0584)	(0.0821)	(0.0538)
Observations	4,211	4,400	4,400	4,400	4,400
R-squared	0.303	0.044	0.060	0.074	0.051
Number of women in panel	1,630	1,653	1,653	1,653	1,653
Mean of Dependent Variable	6.691	0.848	0.649	0.768	0.208
	B. High-education mothers				
Child in Primary School x Fraction FDS schools in municipality	0.306*	-0.0358	0.0186	0.137**	-0.0084
	(0.175)	(0.0601)	(0.0964)	(0.0619)	(0.0930)
Observations	1,563	1,632	1,632	1,632	1,632
R-squared	0.397	0.073	0.101	0.093	0.119
Number of women in panel	685	697	697	697	697
Mean of Dependent Variable	7.388	0.919	0.831	0.924	0.140

Source: Authors' estimates based on data from the EPS surveys for 2002, 2004, 2006, 2009, and 2015.
Notes: The sample included working women who had primary school-aged children when they were surveyed, in at least one round of the survey. The fraction of FDS Schools is the share of schools with 100% of their grade levels under the FDS regime. Robust standard errors, clustered at the municipal level, in parentheses. ***, **, * reflect statistical significance at 1%, 5% and 10% levels, respectively. Variables not shown: youngest child in primary school, fraction of FDS Schools in municipality, mother's years of education, mother's age and age squared, presence of children aged 0-5, 6-13, 14-18 and 18+ in household, municipal average school attainment, municipal rates of poverty, rural population, women's and men's employment, women's and men's labor force participation, region-year fixed-effects, interactions between a categorical variable for municipal women's labor force participation rate in 2000 and year fixed-effects, and individual fixed-effects.

Intra-household Gender Gaps

The effect of childcare policies on intra-household gender gaps in labor outcomes has received less attention in the literature, most likely due to the lack of suitable data. Taking advantage of the structure and richness of our data, we also estimated the effects of the FDS policy on employment outcomes of mothers relative to their husbands/partners (either legally married or cohabitating).

The EPS survey collected detailed labor market information from the household member designated as the *interviewee* in the survey sample design, as well as some (limited) employment and income variables from other household members, including spouses or partners (when present). We used this data to construct variables on: hours worked, employment status, and whether the job had a formal contract, for both members of the couple. We estimated whether the FDS policy affected men and women's employment in the couple differently, thereby reducing gender gaps in employment and job quality.[29] Although employment and working hours can be considered measures of labor supply and not strictly of job quality, we include them in our analysis because they provide complementary evidence on the role of the FDS policy in reducing intra-household gender gaps.

Formally, we estimated a fully interacted version of model (1), where we interacted the policy variable of interest (FDS) and all control variables with a categorical variable for women. The model we estimated can be written as follows:

$$Q_{ijmrt} = \varphi_1 \text{FDS}_{mrt} + \varphi_2 PSAge_{jmrt} + \varphi_3 W_i + \varphi_4(\text{FDS}_{mrt} \times PSAge_{jmrt}) + \varphi_5(\text{FDS}_{mrt} \times W_i) + \varphi_6(PSAge_{jmrt} \times W_i) + \varphi_7(\text{FDS}_{mrt} \times PSAge_{jmrt} \times W_i) + (X_{imrt}\beta^M + M_{mt}\mu^M + \tau_{rt}^M + \delta_t^M D_{mr})(1 - W_i) + (X_{imrt}\beta^W + M_{mt}\mu^W + \tau_{rt}^W + \delta_t^W D_{mr})W_i + \alpha_j + \epsilon_{imrt} \quad (2)$$

Where Q_{ijmrt} represents a labor market outcome for individual i in couple j, living in municipality m and region r in year t, and $PSAge_{jmrt}$ is a dummy variable that equals 1 if the couple has a child of primary school age (6-13 years) in year t, and 0 otherwise. To control for structural gender differences, W_i –a binary indicator that takes the value of 1 if i is a woman and 0 if a man– was interacted with all control variables.

In this model, the effect for men affected by the policy (those with children of primary school age) is $\varphi_1 + \varphi_4$; for women not fully affected by the policy (those without children of primary school age) is $\varphi_1 + \varphi_5$; and for women that are affected by the policy (with children of primary school age) the effect of the policy is $\varphi_1 + \varphi_4 + \varphi_5 + \varphi_7$. We report estimates of model (2) in Table 10, including tests for the joint significance of these three groups' estimated effects.

We find that an increase in FDS access when parents benefit from the policy reduces the intrahousehold gender gap in terms of the likelihood of having a job with a contract. At the bottom part of the table, we report the p-values of the tests of joint significance of the relevant coefficients. These tests show that the overall effect of the policy is small but significant for mothers with children in primary school (i.e., $\varphi_1, \varphi_4, \varphi_5, \varphi_7$ are jointly different from zero). An increase of 25 percentage points in FDS access increases mothers' likelihood of a formal contract by 3.6 percent for all couples (column 3) and of 1.3 percent for couples in which both partners work (column 4), relative to their husbands/partners. These findings suggest that access to FDS schooling not only helps women improve the quality of their jobs but also helps reduce intra-household gender inequalities.

[29] We use the EPS rounds from 2002, 2004, 2006 and 2009 because those rounds include information for the spouse/partner and allow us to construct labor market outcomes that can be compared with those individuals interviewed. For the contract variable, we estimate a regression with all couples, and another that includes couples in which both of them are working.

Table 9. Effect of longer school schedules on intra-household gender gaps in employment quality

	Labor Supply		Employment Quality	
VARIABLES	Employment (1)	Hours (2)	Contract (All couples) (3)	Contract (Working couples) (4)
A. FDS Access	0.0406	4.341	-0.0327	-0.122
	(0.0819)	(4.787)	(0.0877)	(0.0861)
B. FDS Access x Child in Primary School	-0.0238	-0.437	-0.0272	0.0254
	(0.0731)	(4.191)	(0.106)	(0.119)
C. FDS Access x Woman	0.0170	0.656	-0.0301	-0.0391
	(0.0331)	(2.104)	(0.0556)	(0.0492)
D. FDS Access x Woman x Child in Primary School	0.0490	2.460	0.130*	0.171*
	(0.0454)	(2.551)	(0.0705)	(0.0932)
Observations	28,212	28,298	28,270	18,502
R-squared	0.359	0.337	0.192	0.030
Number of households	4,703	4,703	4,703	4,636
P-value of test of joint significance:				
A and B coefficients	0.726	0.545	0.747	0.184
A and C coefficients	0.880	0.611	0.767	0.342
A, B, C and D coefficients	0.464	0.308	0.0375	0.0876
Mean of Dependent Variable for:				
Men	0.899	41.84	0.608	0.676
Women	0.420	17.32	0.281	0.668

Source: Authors' estimates based on data from the EPS surveys for 2004, 2006, and 2009.
Notes: Estimations from an unbalanced panel of households with both spouses present. Includes couples that are married or cohabitating. Column 4 includes couples in which both spouses are working. Other controls: individual schooling, age, and whether individuals were the main interviewed household member or the spouse; household demographic composition; municipal-level variables includes: poverty rates, average income, average schooling, and average male and female labor force participation rates; region-year effects; trend for low initial female LFP, municipality trend. In all regressions, we included a household fixed effects and control variables were interacted with a dummy variable for female (fully-interacted model).

6. Conclusions

We analyzed the effect of access to childcare on mothers' quality of employment. A national school reform in Chile extended the primary school day from half- to full-day schedules. We exploited its implementation to study the impact on mothers most affected by the policy: those with a primary school-age child in at least one of the years she was interviewed. Conditional on time-invariant individual fixed effects and pre-existing trends in women's employment, our identification strategy relied on exogenous changes in the availability of full-day primary schools across time and municipalities and on whether any of the mother's children were of primary school age in a given year.

Our estimates indicated that mothers responded to greater access to FDS by improving their job's quality. An increased FDS access of twenty-five percentage points would lead to an increase in mothers' likelihood of having a formal contract of 3.1 percent, while it would decrease the probability of being self-employed (a more precarious and insecure job status) by 10 percent. Employment-quality benefits differ by mothers' education level: low-educated mothers exposed to the policy saw an increase in the likelihood of full-time employment, contract and a decrease in self-employment, while high-education mothers saw an increase in wages and open-ended contracts.

Our results contribute to the literature by finding that policies that expand childcare for school-aged children positively affect the quality of jobs that mothers can access due to the implicit childcare subsidy provided by longer school schedules. Mothers plausibly have more time to engage in more successful job searches, and the employment options available to them expand, particularly in the case of full-time jobs that are associated with other dimensions of employment quality in Chile, such as jobs with contracts and social protection. We were also able to explain the likely mechanisms driving the result, finding that the implicit childcare subsidy provided by the FDS policy reduced mothers' opportunity cost of work, facilitated their entry into the labor force, and lengthened their work hours, all of which allowed them access to better jobs.

These findings are novel and complement our understanding of how childcare affects mothers' job quality. They suggest that longer school schedules not only benefit children themselves, but that they also affect other family members. Additionally, we provide evidence that the policy might help reduce intra-household gender gaps in labor supply and job quality (jobs with contracts). Therefore, by increasing mothers' employment quality, access to childcare plays an important role in reducing within-household gender inequality (through more labor market engagement and higher maternal incomes), and income inequality in general due to the policy's greater benefits among lower-educated (poorer) women. Finally, access to schools with longer schedules, by improving household incomes, increases overall family welfare.

The lessons learned in this paper are especially relevant amid the COVID-19 pandemic, since school closures and remote learning at home have negatively impacted women's employment in all countries across the globe. This has brought to the forefront both the childcare role of schools, and the sensitivity of female work decisions to childcare shocks. Maintaining the gains in women's employment—including the quality of their jobs—will remain a relevant policy concern in the coming years. Our paper provides evidence that childcare has an important role in post-pandemic recovery.

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