The Effect of Children's Time in School on Mothers' Labor Supply: Evidence from Mexico's Full-Time Schools Program*

María Padilla-Romo
Francisco Cabrera-Hernández

March 2018

Abstract

This paper examines the effect of the time children spend in school on female labor supply. In particular, we investigate the degree to which extending the school day by three and a half hours, in elementary schools, affects labor force participation, the number of weekly hours worked, and the monthly earnings of females with elementary-school-age children. To do so, we exploit within-individual variation in access to full-time schools and a rotating panel of households that contains individual-level data on labor outcomes and sociodemographic characteristics. Results from long-difference models show that extending the school day increases mothers' labor supply at the extensive and intensive margins, increasing mothers' labor force participation by 5 percentage points and the number of weekly hours worked by 1.8. Moreover, these increases are accompanied by an increase in monthly earnings.

Keywords: Female labor; Education; Childcare; Childrearing

JEL classification: I25, J13, J22.

*Padilla-Romo is an Assistant Professor at The University of Tennessee, Department of Economics; and Cabrera-Hernández is a Research Director at Centro de Cooperación Regional para la Educación de Adultos en América Latina y el Caribe (CREFAL). Contact at: mpadill3@utk.edu, francisco.cabrera@crefal.org. We would like to thank Mark Hoekstra, Lars Lefgren, Jason Lindo, Jonathan Meer, Analisa Packham, Steven Puller, Zoe Sherman, Manuelita Ureta, Emily Zheng and participants at the 2016 Southern Economic Association Conference for useful feedback on work in progress. Padilla-Romo gratefully acknowledges support from the Private Enterprise Research Center at Texas A&M University.

1 Introduction

Despite the growth in female labor force participation (LFP) in recent decades, female participation rates have remained lower than their male counterpart. Moreover, this gap is especially large in the developing world, where traditional gender roles assign women the primary responsibility of childrearing. As a result, women's labor supply in developing countries heavily depends on their fertility decisions, and specifically, on how much they are time- and budget- constrained due to childrearing and the alternative costs of childcare institutions. Thus, the availability and affordability of childcare centers are important for women to increase their labor market participation while their children are still growing up.[1]

Studies of the US have proposed that the absence of family-friendly policies, including parental leave and part-time work entitlements, explains 28-29 percent of the decrease in female labor force participation in the US, relative to other OECD countries, over the period from 1990 to 2010 (Blau and Kahn, 2013). Different governments around the globe have responded to the low female participation rates in the labor market with a variety of policies such as tax reliefs, child benefits, paid leaves and childcare subsidies. As different countries continue to consider these types of policies, it remains important to understand their costs and benefits. To this end, this paper studies the effect of an implicitly large childcare subsidy, through longer school-days in primary education, on mothers' labor supply at the extensive and intensive margins.

When the public provision of regulated childcare institutions is low or absent, mothers'

[1]For a discussion of such influences on female labor participation in the context of the countries in the Organization for Economic Cooperation and Development (OECD), see Jaumotte (2003).

chances to participate in the labor market may decrease depending on the supply and quality of the available alternatives for childcare. The option to take care of their children may range from a costly private institution with an uncertain quality to non-professional options, such as family members, close friends, and untrained babysitters (Bernal and Keane, 2011; Schady et al., 2015). In such contexts, Full-Time School (FTS) programs work as a childcare alternative provided by trained caregivers (i.e. teachers) in a controlled environment. Consequently, FTS programs have the potential to positively affect children's outcomes along with mothers' labor force participation (LFP).[2]

To provide evidence on the effects of extending the school-day in primary education on mothers' labor supply, we take advantage of a natural experiment in Mexico where the government implemented a FTS program that extended the school-day from four and a half to eight hours in elementary schools (1st-6th grades) all over the country between 2007 and 2015. Our empirical strategy exploits within-individual variation in exposure to full-time schools—defined as the predicted share of FTS seats in a municipality—to estimate the effects on female labor supply at the extensive and intensive margins.

We use eleven years of data collected in the National Employment and Occupation Survey in Mexico (ENOE, for its abbreviation in Spanish). ENOE is a rotating panel of households that contains information on mothers' labor force participation, number of weekly hours worked, earnings, and sociodemographic characteristics that allow us to identify the cumula-

[2]However, despite the evidence showing that FTS programs can improve children's academic performance (Bellei, 2009; Cabrera-Hernandez, 2015; Padilla-Romo, 2015), reduce high school dropout rates (Pires and Urzua, 2010), and reduce the probability of teenage pregnancy (Kruger and Berthelon, 2009), it is an open question whether other outcomes are affected favorable or unfavorable. Perhaps, longer days at school are detrimental to children's behavior, emotional attachment to family or other psychological factors not observed in the data (see Kottelenberg and Lehrer, 2017, for a discussion).

tive effects of longer school days on mothers' labor supply, to identify heterogeneous effects by education level, by poverty level of the locality of residence, and by child's gender, and to provide evidence that the effects are not driven by changes in the propensity to participate in the labor force in municipalities with full-time schools.

The existing literature has focused on evaluating the impact of childcare institutions for preschool-age children (3 to 5 years old) in developed countries, showing some positive effects on mothers' labor supply.[3] However, the differences between richer and poorer countries in labor institutions and trends in female labor supply reduce the scope of such evidence to guide policies in developing countries where, additionally, mothers' low LFP is commonly attributed to cultural factors besides economic conditions.

Evidence for developing countries is scarce but shows a higher likelihood of mothers' employment after increases in childcare supply. Berlinski and Galiani (2007) estimate the effects of an 18 percent increase in preschool availability between 1994 and 2000 in Argentina and find that the likelihood of maternal employment increased between 6 and 16 percentage points depending on the model specification. Similarly, in the case of Mexico, Ángeles et al. (2011) use a time discontinuity in children's eligibility to "Estancias Infantiles," a public childcare program for 265,415 preschool-age children (0-4 years old) all over the country and find an increase of 18 percent in mothers' probability of employment and an average effect of six more hours worked per week.

[3]General results of free preschools on female LFP in the US and Canada show no impact for single mothers with younger children and positive effects on married mothers, both at the intensive and extensive margins (Gelbach, 2002; Baker et al., 2008). Similarly, smaller but significant effects were found for childcare subsidies on mothers' labor supply in countries such as Belgium, France and the Netherlands, while no effects were found for Norway (Dujardin et al., 2015; Givord and Marbot, 2015; Bettendorf et al., 2015; Havnes and Mogstad, 2011).

Few studies have focused on children aged 6 years and older who are still in need of parents' care. Even less so in developing countries.[4] This is an important omission because many children in developing countries are in school for only a few hours a day (4-5 hours), which means they spend more time at home, potentially reducing mothers' availability for paid work. In this regard, Contreras et al. (2010) offer evidence of the effects of a FTS Program that lengthened the school day by 1.5 hours in Chilean schools. The authors estimate an average gain on single mothers' labor force participation of 5 percentage points (equivalent to 6 percent of the baseline) and they find no effect for married mothers. Furthermore, Berthelon et al. (2015) offer evidence of a more permanent effect on female participation, as the probability of staying more than six months in the Chilean labor market increases by 19 percentage points when FTS availability increases 45 percentage points. To the best of our knowledge, evidence on the Chilean FTS Program is the only analysis of the relation between "childcare" for older children and female LFP in a developing country.

By focusing on the Mexican context, we are able to contribute to the existing knowledge on the relationship between longer school days and mothers' labor supply in developing countries. Our work complements Berthelon et al. (2015) who analyze the effects of a 1.5-hour increase in the length of the school day on mothers' labor supply using a panel of 3,350 women from 2004 to 2009.[5] However, our study analyzes the effect of a larger increase (3.5

[4]For example, Nemitz (2015) studies the effects of a sharp increase of more than 30 percentage points in full-time schools in Germany and finds effects close to zero. Similarly Felfe et al. (2013) find a positive effect on mothers' full-time employment, but a negative effect on fathers' employment at the intensive margin in Switzerland.

[5] In related work, Contreras et al. (2010) use repeated cross-sections from the Chilean socioeconomic household survey and administrative data from the Ministry of Education from 1990 to 2006, which does not allow them to control for time-invariant unobserved individual characteristics.

hours) in the time spent in school and we use a dynamic panel of more than 166,000 mothers from 2005 to 2015. This is important because, with a larger increase in the time spent at school, there is more scope for mothers to opt into the labor market. As such, the effects of the intervention we investigate may be quite different. Moreover, our pre-intervention data allow us to provide evidence in favor of the common-trends assumption needed for the difference-in-differences estimates to identify the causal effects of the intervention.

In addition, we offer evidence on the heterogeneous effects of the FTS program on women from different socioeconomic backgrounds, allowing us to consider the degree to which longer school days can reduce the income gap between the rich and the poor. Furthermore, evaluating the effects of a major policy change on female labor supply is important for a more comprehensive understanding of how welfare in a broader sense may be improved by these sorts of policies and how they should be targeted in the future.

Our main results indicate that longer school-days increase mothers' labor supply at the extensive and intensive margins, increasing mothers' labor force participation by 5 percentage points and the number of worked hours per week by 1.8. Moreover, these increases in labor supply are accompanied by a 36 percent average increase in earnings across the population of mothers as a whole, and a 46 percent increase in earnings in high poverty areas. The greater gains in high poverty communities would seem to reduce the income gap between the rich and the poor.

Overall, these results suggest that previous to the introduction of the FTS program, female LFP was certainly constrained by the absence of family friendly policies, particu-

larly childcare institutions. Moreover, FTS policies have the potential not only to improve children's welfare and school outcomes, but also mothers' LFP and the available income at home, improving overall welfare, especially for the most vulnerable sectors of the population.

The rest of the paper proceeds as follows. Section 2 offers information on Mexico's childcare policies, female labor force participation and the Full-Time Schools Program. Section 3 presents the details of the data used for the main analysis as well as some descriptive statistics. Section 4 explains the main methodology to identify the effects of longer school days on mothers' labor supply. Section 5 presents the main results. Section 6 concludes.

2 Background

2.1 Female Labor Force Participation and Childcare in Mexico

In recent decades, female participation rates in Mexico have substantially increased. Diverse factors have pushed women into the labor force, including demographic and cultural shifts, the opening of the Mexican economy, a rise in the levels of formal education, the implementation of structural reforms and a series of economic crises (Orraca et al., 2016).

According to information from Mexico's population censuses, the percentage of women between 18 and 65 years of age participating in the labor force grew from 19.4% in 1970, to 24.2% in 1990 and to 42.3% in 2010. However, Mexican female LFP remains as one of the lowest among Latin-American countries with similar per-capita income. In 2015, only 44% of Mexican women participated in the labor market; this is comparable to a similar proportion in Chile but it is lower than the 53% registered in Argentina and Uruguay and the 59%

observed in Brazil. Furthermore, considering the female to male LFP ratio, Mexico stands next to the lowest in the whole continent with women's labor force participation standing at only 55% that of men, above only Honduras (49%) and below the Latin American average of 66% (Martínez Gómez et al., 2013).

This low women's participation in the labor market potentially relates to the absence of family oriented programs (Staab and Gerhard, 2010). Although some childcare policies have been applied in Mexico before, such as the Federal Daycare Program for Working Mothers which subsidizes community- and home-based daycare to facilitate employment of low-income mothers,[6] the country's spending on family benefits including childcare has not changed dramatically in the last decade and it is barely above 1% of the GDP. This is the worst average of the 33 countries in the OECD, including mid-income countries such as Israel (2.4%) and Chile (1.4%).[7]

Finally, Mexico's enrollment rates in preschool (children 3 to 5 years old) are relatively high (91%) and above the OECD average of 81%. Elementary school (for ages 6 to 12) is practically universal. However, all preschools and elementary schools, before FTS implementation, were part-time, having daily schedules of four to five hours. This plausibly discouraged mothers' full-time participation in the labor market, especially for the 88% of mothers who have no access to full-time childcare services at any given age. The FTS program therefore offers an important potential for the analysis of changes in labor supply in a context of low public investment and low female participation.

[6]For a thorough review of this program see (Staab and Gerhard, 2010).

[7]Data on family policies and school participation and childcare presented in this section are extracted from the OECD Family database downloaded in February 2016.

2.2 The Full-Time Schools Program

The FTS program started in 2007. Its aim was to improve learning opportunities in primary education by extending the school day from four-and-a-half to eight hours. Notably, from its inception, the FTS program identified two secondary objectives of the program: to help single mothers to participate in the labor market and to support mono-parental families (SEP, 2010, p.3). In total, the FTS program represented a public spending of approximately US$460 millions from 2007 to 2013.[8]

Schools selected into the program generally have certain characteristics. The most relevant to this study are: (i) schools have minimum infrastructure requirements (e.g. space for the construction of a kitchen and computer classrooms, sports infrastructure, and basic services such as water and electricity), (ii) schools are working in one shift either in the morning or afternoon but not both (in Mexico, approximately 40% of primary schools offer two shifts), and (iii) preferentially, schools should have been located in vulnerable areas. Nonetheless, these guidelines were only a suggestion provided by the Ministry of Education, not binding requirements, and, in the end, the states were the ones in charge of choosing the schools to be treated. We will discuss in Section 4 how this fact might bias our estimates.

The FTS program started in 500 schools in 15 states and by the 2014-2015 academic year it had reached 23,182 schools all over Mexico, representing about 25 percent of all primary schools. Figure 1 shows the geographic distribution of municipalities' predicted share of FTS seats from the 2007-2008 to the 2014-2015 academic years. Note that by the 2014-2015 academic year, full-time schools were present in all 31 states and in Mexico City and in

[8]For further details of the FTS program see (Cabrera-Hernandez, 2015) and (Padilla-Romo, 2015).

more than 68 percent of the municipalities in Mexico (1,670 out of 2,456). Furthermore, there were 85 municipalities in which all primary schools had entered the program. We take advantage of this staggered implementation of the program, across and within states, in our identification strategy.

3 Data

Our analysis uses survey and administrative data from the National Institute of Statistics and Geography (*Instituto Nacional de Estadística y Geografía*, INEGI), the Ministry of Education, and the National Population Council (*Consejo Nacional de Población*, CONAPO) that together brings a quarterly individual-level dataset covering the period from the first quarter of 2005 (2005:Q1) to the third quarter of 2016 (2016:Q3). Our primary outcome variables are labor force participation, number of weekly hours worked, and monthly earnings of females with elementary school-age children, while our treatment variable is the share of predicted FTS seats in a municipality at a given quarter.[9]

The labor outcomes used in our analysis are based on the National Survey of Occupation and Employment (*Encuesta Nacional de Ocupación y Empleo*, ENOE) from INEGI. ENOE is a rotating panel of households, in which each household remains in the survey for five consecutive quarters. That is, we observe whether household members change labor force participation status, number of weekly hours worked, or monthly earnings over five consecu-

[9]To avoid concerns about endogeneity, we define the predicted number of seats in full-time schools as the average school enrollment before the FTS program began (2001-2006). Ideally, if we were able to observe schools' capacity, our treatment variable would be the share of FTS seats at a given year. However, we only observe school enrollment which, particularly in full-time schools, may be correlated with mothers' propensity to participate in the labor market.

tive periods.[10] In addition, ENOE contains information on sociodemographic characteristics of the individuals, as well as the location of the household. These allow us to control for time-varying individual characteristics, and to match each individual with the share of FTS seats in the municipality every quarter. We also use the location information to match each mother to the poverty index of her locality of residence.[11] This allows us to consider heterogeneous effects of the extension of the school day on mothers' labor supply that reside in high- and low- poverty areas. The poverty index is estimated by CONAPO as a measure of social exclusion in the locality using information from the Census of Population and Housing on education, housing characteristics, population, and income.[12] To avoid concerns about endogeneity, we use the poverty index of the localities in 2005, which is two years prior to the extension of the school day.

The treatment variable is constructed using annual school-level census data on enrollment and participation in the FTS program from the Ministry of Education. Information on enrollment is based on *Estadísticas 911* from the Ministry of Education. To transform this information from academic years to quarters, we take the last and the first three quarters of the year. For example, the fraction of seats in full-time schools during the 2007-2008 academic year affects labor outcomes on 2007:Q4, 2008:Q1, 2008:Q2, and 2008:Q3.[13]

[10] In ENOE, labor force participation is defined as people over 15 years old that had a job or were looking for one during the week the survey was conducted, the number of weekly hours worked is defined as the average number of hours worked by an individual in the week of the survey, and the monthly earnings is defined as the income that the employed population received for the job they held in the week of the survey.

[11] The term locality in Mexico refers to the smallest of the three levels of division (locality, municipality, and state) of the national geostatistical framework. It is a generic territorial division for a population center with its own identity. It can be small in size and population (country, or village) or large and highly populated (city). INEGI keeps control of the list of localities in Mexico.

[12] Mothers living in high- and low- poverty areas are defined as those living in a locality with poverty index above and below the sample median.

[13] In Mexico, an academic year begins the third Monday of August and ends in July after 200 days of

Our main analysis focuses on mothers who are the household's head and on wives over 15 years old whose children are studying elementary education, because for this group we can unambiguously match mothers to their children. Moreover, it is plausible to think that mothers are the group of females who are more affected by the policy.[14]

4 Identification Strategy

We estimate the effects of extending the school day on female labor outcomes using a difference-in-differences research design that uses within-individual variation in access to full-time schools, which is defined as the share of predicted FTS seats in a municipality. The logic behind this approach is that mothers living in municipalities with a high share of predicted FTS seats are in a position to benefit from the extended school day, increasing their labor supply, while females in municipalities with a low share are not. Therefore, we compare changes in labor outcomes of females with school-age children in municipalities with full-time schools to the change observed in municipalities not affected by the policy extending the school day.

The predicted share of FTS seats in a municipality m at time t is defined as,

$$FTS_{mt} = \frac{\sum_{s \in m} \bar{e}_s FT_{st}}{\sum_{s \in m} \bar{e}_s} \tag{1}$$

instruction. We start treatment during the fourth quarter because the third quarter contains all summer vacation. So that mothers in our sample are exposed to the program at most 1.25 academic years.

[14]Note that, by using this approach we cannot identify the effect for females with elementary-school-age children that live in extended households.

where $\bar{e}_s$ denotes the average enrollment of school s in the period from 2001 to 2006 and FT_{st} is an indicator of whether school s is in the FTS program at time t.

Because the fraction of predicted FTS seats changes only once within the range of the data for each individual, we use only the variation from the first and fifth periods with a long-difference regression model.[15] This specification allows us to estimate the longer-run effects of extending the school day. Our main results are based on the following model,

$$\Delta_4 Y_{imt} = \Delta_4 FTS_{mt}\delta + \gamma_t + \Delta_4 X_{imt}\beta + \Delta_4 u_{imt} \tag{2}$$

where Y_{imt} denotes either an indicator variable reflecting whether individual i in municipality m participated in the labor force at quarter t, the number of weekly hours worked, or the log of monthly earnings of individual i in municipality m at quarter t; FTS_{mt} is the fraction of predicted FTS seats in municipality m at quarter t; X_{imt} include time-varying individual controls including years of schooling, age, and age of the youngest child; γ_t are year-by-quarter fixed effects; u_{imt} is an error term; and Δ_4 denotes the 4-period difference operator (e.g., $\Delta_4 FTS_{mt} = FTS_{mt} - FTS_{mt-4}$). This long-difference regression equation allows us to control for individual specific observed and unobserved characteristics that are constant over time, as well as, nationwide time-varying shocks to mothers' labor outcomes common to all municipalities. The coefficient of interest (δ) can be interpreted as the cumulative effect of the FTS program on the change in labor outcomes over the 5-quarter period that each individual is observed, instead of the average effect, as in fixed effects models.

Additionally, in some specifications we control for state-by-year-by-quarter fixed effects

[15] Note that the number of full time seats varies only once a year, as the share of FTS students in each municipality can only change at the beginning of each academic year, when new schools fully incorporate the program, conversely, non-FTS schools remain as such during the whole academic year.

where we identify δ by comparing changes in labor outcomes in municipalities with a high fraction of predicted FTS seats to the change observed in the remaining municipalities in the same state. Robust standard errors are clustered at the municipality-level to account for potential error correlations within municipalities.

The identifying assumption underlying our research design is that in the absence of the extension of the school day, changes in mothers' labor supply in municipalities with a high fraction of predicted FTS seats would have been similar to those in municipalities with a lower fraction (in the same state). Even though we cannot prove that this assumption holds, we can argue that it is plausible in our setting. First, we are able to provide graphical evidence that mothers' labor outcomes in treatment and control municipalities do not diverge *prior* to the adoption of the FTS program. Second, we formally test for divergence by including lead terms of the change in fraction of predicted FTS seats a year and two years prior to treatment to Equation 2. In addition, we provide evidence showing that the time-varying factors that affect female labor outcomes are orthogonal to the within-municipality variation in the fraction of predicted FTS seats. Finally, we show that the extension of the school day does not affect labor supply for subgroups of the population that should not be (directly) affected by the intervention. In this case δ would provide the causal effects of extending the school day on female labor supply.

Another concern about the validity of the estimated effects is that females with school-age children could select into or out of the municipality in quarters that increased the fraction of predicted FTS seats. For example if females with school-age children that are more likely

to participate in the labor force move to municipalities with full-time schools, we would overestimate the effects of extending the school day. We address this potential selection bias problem by estimating the degree to which the change in the fraction of predicted FTS seats affects the probability of mothers staying in their municipality of residence during the first and fifth survey quarters.

It is important to note that our treatment variable is a measure of access to full-time schools, not an indicator of having a child enrolled in a full-time school. As such, we identify the effects of making full-time schools more available in a municipality instead of the effects of having a child enrolled in a full-time school. That is, our approach identifies *intent-to-treat* effects rather than *treatment-on-the-treated*. These intent-to-treat estimates can be thought of as lower bounds of the actual effects of the extension of the school day.

5 Results

We begin our analysis by providing graphical evidence on the effects of extending the school day and on the identifying assumption underlying our research design. Figure 2 panels (a) to (c) respectively show the state-by-year-by-quarter adjusted average mothers' LFP, number of weekly hours worked, and monthly earnings over time for municipalities with a fraction of predicted FTS seats that is in the top quartile (high-intensity of treatment) relative to those in the bottom quartile (low-intensity of treatment). While it is not easy to appreciate the size of the effects, the three panels show an increase on LFP, number of weekly hours worked, and monthly earnings for females with elementary-school-age-children in municipalities with

a high-intensity of treatment (relative to municipalities with low-intensity of treatment in the same state). Furthermore, mothers' LFP, number of weekly hours worked and monthly earnings for municipalities with a high and low intensity of treatment have similar trends *prior* to the introduction of the FTS program, providing support in favor of the identifying assumption needed for the difference-in-differences estimates to be valid.

Table 1 shows the estimated effects of extending the school day on female labor outcomes based on the long-difference model represented by Equation 2. Panel A shows the estimated effects on mothers' LFP, Panel B the number of weekly hours worked, and Panel C the monthly earnings. Particularly, estimates in Column 1 show the baseline model represented by Equation 2. In Column 2, we additionally control for state-by-year-by-quarter fixed effects. In Column 3, we include time-varying individual controls. Finally, in columns 4 and 5, we test for divergence prior to treatment by including the 4-period difference in fraction of predicted FTS seats one year and two years *prior* to treatment.

The long-difference estimates show the cumulative effects of going from none to all schools being full-time, which results in increases on mothers' LFP of 5 percentage points, number of weekly hours worked of 1.8, and monthly earnings of 36 percent. Alternatively, we consider the effects of a 25 percentage point increase in the predicted share of FTS seats—equivalent to increasing the intensity of treatment in a municipality from low to high. A 25 percentage point increase causes mothers' LFP to increase by 1.25 percentage points, the number of weekly hours worked by 0.45 hours, and monthly earnings by 9 percent.[16] In addition, the

[16] That is, 0.25x0.05x100 for female LFP, 0.25x1.859 for weekly hours worked, and 0.25x.36x100 for monthly earnings.

coefficients for one year and two years prior to treatment are not significant and small in magnitude, providing support for our identification strategy.

It is important to note that mothers were linked to the fraction of predicted FTS seats based on their municipality of residence. Given this approach, non-random sample attrition could be a threat to identification if most of the mothers leaving the sample lived in municipalities that increase (decrease) the intensity of treatment.[17] In consideration of this potential differential attrition problem, we examine whether the change in the fraction of predicted FTS seats in a given quarter affects the likelihood that the mother will be in the sample during the first and last periods.

Table 2 shows the estimated effects of the share of predicted FTS seats on an indicator variable of whether or not the mother is in the sample during the first and fifth interviews. In Column 1, we present the baseline model represented by Equation 2; in Column 2, we additionally control for state-by-year-by-quarter fixed effects. The long-differences estimates indicate that changes in the share of predicted seats in full-time schools do not affect the probability of leaving the sample in the fifth interview. These results suggest that attrition is independent of changes in exposure to full-time schools.

5.1 Treatment Heterogeneity

We now explore the extent to which there are heterogeneous effects of extending the school day on mothers' labor supply. In particular, we consider heterogeneous effects by education,

[17] Cano-Urbina (2016) highlights the attrition problem in the ENOE for the period 2005–2012; he finds that 84.19 percent of the individuals who started the sample are still in it during the fifth interview.

by poverty level of the locality of residence, and by children's gender, using our preferred specification.

5.1.1 Education

Motivated by the fact that education strengthens the connection of mothers to the labor force by increasing their potential earnings, or by reducing the range for specialization within the household (Eckstein and Lifshitz, 2011), in columns 2 and 3 of Table 3, we report separate estimates for mothers with levels of education below (0-9 years) and above (10 or more years) the sample median.[18] The estimates in columns 2 and 3 indicate that the effects of extending the school day are concentrated among low educated mothers, who are less attached to the labor market.[19] Specifically, these results indicate that going from none to all schools being full-time increases mothers' LFP by 7.4 percentage points, the number of weekly hours worked by 2.4 hours, and the monthly earnings by 51 percent for low educated mothers. We find no evidence of significant effects on labor outcomes for higher educated mothers.

5.1.2 Poverty Level

Now we estimate the effects of extending the school day on labor supply separately for mothers with residence in localities with poverty levels below (low poverty) and above (high poverty) the sample median. This analysis is motivated by the fact that preference in FTS

[18]Nine years of schooling translates into completed junior high school, which is also the sample median and the compulsory level of education in Mexico.

[19]In our sample, LFP for mothers with education levels between zero and nine years is 38.4 percent, compared to 62.3 percent for mothers with ten or more years of schooling.

funding was given to schools located in vulnerable areas. Therefore, we expect our long-difference estimated effects to be mostly driven by mothers with residence in high poverty localities, as they are more likely to live closer to full-time schools.

Table 4 shows the estimated effects by poverty level of the locality of residence. The estimated coefficients indicate that increases in labor supply are mostly driven by mothers residing in high poverty communities, increasing LFP by 6.6 percentage points, weekly hours worked by 2.42, and monthly earnings by 46 percent in high poverty areas. We find no effects on mothers residing in low poverty localities. These results support the notion that mothers living in vulnerable areas are the most likely to be affected. Moreover, the greater gains in high poverty communities would seem to reduce the income gap between the rich and the poor.[20]

5.1.3 Child's Gender

We estimate the effects of longer school days on mothers' labor supply by child's gender. This analysis is motivated by the increasing literature documenting differential effects of sons and daughters on parental time allocation and labor supply (e.g., Lundberg and Rose, 2002; Lundberg, 2005; Pabilonia and Ward-Batts, 2007; Lundberg et al., 2007a,b; Barcellos et al., 2014). In particular, we are interested in analyzing how mothers' labor supply responds to the availability of full-time schools when they have school-age daughters or sons; they might

[20] Additionally, as informality in the labor market is a common phenomenon in the least developed countries, most of all in high poverty communities, we assess if the changes in female LFP are related to informality. We present such results in Table A.1, where each column follows the same specifications as in Table 1. Panel A shows the estimated effects on employment, Panel B on formal employment and Panel C on informal employment. Our estimates show that the estimated increase in employment (4.7 percentage points) strongly concentrates in the informal sector.

believe, especially in developing countries, that boys can take care of themselves but girls need adult supervision throughout the day.

Table 5 shows the long-difference estimated effects on labor outcomes separately for three groups of mothers: those whose school-age children are (i) daughters only, (ii) daughters and sons, and (iii) sons only. The estimated coefficients indicate that the increases on labor supply are mostly driven by mothers whose school-age children are daughters; the estimated effects are about twice as big as those from the overall sample. For mothers with both sons and daughters or with sons only, the point estimates are positive but much less precise. This evidence is consistent with the findings of Lundberg et al. (2007a) which suggest that single mothers with only one child spend more time with their daughters relative to their sons and that this mother-daughter time comes from reduced labor force participation. That is, if daughters are at school most part of the day, mothers have more freedom to opt into the labor market.

5.2 Robustness Checks

In an effort to show that the main results are not driven by a simultaneous increase in the propensity to participate in the labor force due to the labor market characteristics in those municipalities with a higher share of predicted FTS seats, we explore the degree to which extending the school day differently affects labor supply of women and men with and without school-age children. If we find effects on subgroups of the population that should

not be affected by the policy, our results might not be valid.[21] It is important to note that it is possible that labor outcomes for these groups might be affected by the extension of the school day; however, we argue that such effects must be second-order.

Table 6 shows the long-difference estimated effects on labor outcomes for women and men. In particular, in Column 2 we show the effects for women without school-age children; for this group of women, we find positive but smaller effects than for women with school-age children (Column 1) on LFP, suggesting a spillover effect possibly driven by other family members taking care of the children after school or increased labor demand in the education sector. However, for this same group we find no significant effects on number of weekly hours worked or on labor income. In columns 3 and 4, we show the estimated effects for men with and without school-age children. For both groups estimates for LFP, number of weekly hours worked, and monthly earnings are close to zero and statistically insignificant.

Figure 2 shows a sharp decrease in the labor outcomes of mothers with school-age children in low intensity of treatment municipalities. Thus, the effects we find might be driven by other changes in factors affecting the labor market that occurred simultaneously to school-day extensions.[22]

To address this concern, we restrict our sample to municipalities with a predicted share of FTS seats in the second, third, or fourth quartiles. That is, we drop all observations

[21] Trends on labor force participation for women without children and men, before and after policy implementation, are presented in Figures A.1, A.2 and A.3. For all groups labor outcomes' trends did not diverge prior to the intervention and for men the low and high penetration groups were trending similarly even after the intervention.

[22] One hypothesis explaining the aforementioned drop in outcomes for the low intensity of treatment municipalities, after observing males' trends in LFP and earnings as shown in Figures A.2 and A.3, is that men plausibly start to return to the labor market after the economic crisis of 2009, which possibly causes women who had entered the labor market, with no access to childcare, to return home for childrearing.

in low intensity of treatment municipalities. Table 7 shows the long-difference estimated effects for this restricted sample, following the same specifications as in Table 1. Even after using this alternative source of variation, for all labor outcomes, the estimated effects remain significant and are similar in magnitude, providing further support for our main results to be valid.[23]

Finally, the main results could be biased by mothers who are not affected by the FTS program, because they are attending school and are not fully committed to the labor market. To address this concern, Table 8 shows the results for a restricted sample of women of ages 25 onwards, who are less likely to be attending school. Note that the results remain robust and are not statistically different from the main results.

6 Conclusion

This paper examines whether the FTS program in Mexico, which substantially increased the length of the school day, increased mothers' labor supply. More broadly, it asked whether childrearing hinders women's participation in the labor market. We exploit the variation in the staggered implementation of the FTS program and the intensity of treatment across municipalities to measure the effects of the extension of the school day on mothers' labor supply at the intensive and extensive margins. Using survey and administrative data, we estimate long-difference models which exploit differences in mothers' exposures to the FTS

[23]Tables A.2, A.3, and A.4 respectively show the effects on female labor outcomes by education, by poverty level, and by child's gender for this restricted sample. The impacts on labor outcomes by education, by poverty level, and by child's gender are also robust to excluding the low intensity of treatment municipalities, lending support to our main results.

program. Our main results document positive and statistically significant effects on mothers' labor force participation, number or weekly hours worked, and monthly earnings. Mothers with fewer years of schooling, mothers living in high poverty localities, and mothers with daughters showed the strongest labor market response to the availability of full time schools for their children. This evidence suggests that longer school days can be an effective policy to increase mothers' labor market participation while their children are still growing up and that the greater gains for low income mothers would seem to reduce the income gap between the rich and the poor.

References

Ángeles, G., P. Gadsden, S. Galiani, P. Gertler, A. Herrera, P. Kariger, and E. Seira (2011): "Evaluación de impacto del programa estancias infantiles para apoyar a madres trabajadoras," *Informe final de la evaluación de impacto. CIEE e INSP.*

Baker, M., J. Gruber, and K. Milligan (2008): "Universal child care, maternal labor supply, and family well-being," *Journal of Political Economy*, 116, 709–745.

Barcellos, S. H., L. S. Carvalho, and A. Lleras-Muney (2014): "Child gender and parental investments in india: are boys and girls treated differently?" *American Economic Journal: Applied Economics*, 6, 157–189.

Bellei, C. (2009): "Does lengthening the school day increase students' academic achievement? Results from a natural experiment in Chile," *Economics of Education Review*, 28, 629–640.

Berlinski, S. and S. Galiani (2007): "The effect of a large expansion of pre-primary school facilities on preschool attendance and maternal employment," *Labour Economics*, 14, 665–680.

Bernal, R. and M. P. Keane (2011): "Child care choices and children's cognitive achievement: The case of single mothers," *Journal of Labor Economics*, 29, 459–512.

Berthelon, M., D. I. Kruger, and M. A. Oyarzun (2015): "The effects of longer school days on mothers' labor force participation," *Working Paper*.

Bettendorf, L. J., E. L. Jongen, and P. Muller (2015): "Childcare subsidies and labour supply—Evidence from a large Dutch reform," *Labour Economics*, 36, 112–123.

Blau, F. D. and L. M. Kahn (2013): "Female labor supply: Why is the United States falling behind?" *The American Economic Review*, 103, 251–256.

Cabrera-Hernandez, F. (2015): "Does lengthening the school day increase students academic achievement? Evidence from a natural experiment," *Working Paper*.

Cano-Urbina, J. (2016): "Informal labor markets and on-the-job training: Evidence from wage data," *Economic Inquiry*, 54, 25–43.

Contreras, D., P. Sepúlveda, and S. Cabrera (2010): "The effects of lengthening the school day on female labor supply: Evidence from a quasi-experiment in Chile," *Serie Documentos de Trabajo*, 323.

Dujardin, C., M. Fonder, and B. Lejeune (2015): "Does formal child care availability for 0-3 year olds boost mothers' employment rate? Panel data based evidence from Belgium," *Working Paper*.

Eckstein, Z. and O. Lifshitz (2011): "Dynamic female labor supply," *Econometrica*, 79, 1675–1726.

Felfe, C., M. Lechner, and P. Thiemann (2013): "After-school care and parents' labor supply," *Working Paper*.

Gelbach, J. B. (2002): "Public schooling for young children and maternal labor supply," *The American Economic Review*, 92, 307–322.

Givord, P. and C. Marbot (2015): "Does the cost of child care affect female labor market participation? An evaluation of a French reform of childcare subsidies," *Labour Economics*, 36, 99–111.

Havnes, T. and M. Mogstad (2011): "Money for nothing? Universal child care and maternal employment," *Journal of Public Economics*, 95, 1455–1465.

Jaumotte, F. (2003): "Female labour force participation: past trends and main determinants in OECD countries," *OECD Working Paper*.

Kottelenberg, M. J. and S. F. Lehrer (2017): "Targeted or universal coverage? assessing heterogeneity in the effects of universal childcare," *Journal of Labor Economics*, 3, 609–653.

Kruger, D. I. and M. Berthelon (2009): "Delaying the bell: the effects of longer school days on adolescent motherhood in chile," *Working Paper*.

Lundberg, S. (2005): "Sons, daughters, and parental behaviour," *Oxford Review of Economic Policy*, 21, 340–356.

Lundberg, S., S. McLanahan, and E. Rose (2007a): "Child gender and father involvement in fragile families," *Demography*, 44, 79–92.

Lundberg, S., S. W. Pabilonia, and J. Ward-Batts (2007b): "Time allocation of parents and investments in sons and daughters," *Unpublished paper*.

Lundberg, S. and E. Rose (2002): "The effects of sons and daughters on men's labor supply and wages," *The Review of Economics and Statistics*, 84, 251–268.

Martínez Gómez, C., T. Miller, and P. Saad (2013): "Participación laboral femenina y bono de género en América Latina," *CEPAL Working Paper*.

Nemitz, J. (2015): "The effect of all-day primary school programs on maternal labor supply," *Working Paper*.

Orraca, P., F.-J. Cabrera, and G. Iriarte (2016): "The gender wage gap and occupational segregation in the Mexican labour market," *EconoQuantum*, 13, 51–72.

Pabilonia, S. W. and J. Ward-Batts (2007): "The effect of child gender on parents' labor supply: An examination of natives, immigrants, and their children," *The American Economic Review*, 97, 402–406.

Padilla-Romo, M. (2015): "The short and long run effects of full-time schools on academic performance," *Working Paper*.

Pires, T. and S. Urzua (2010): "Longer school days, better outcomes?" *Working Paper*.

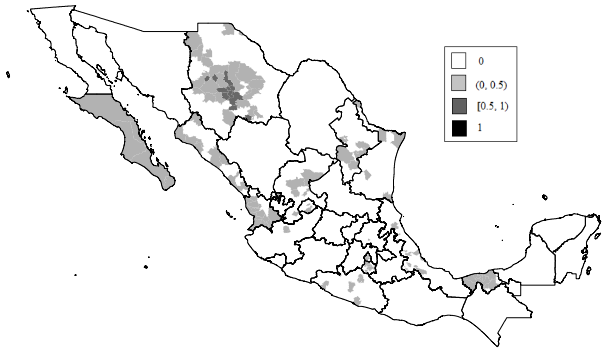
Schady, N., A. P. Expósito, F. L. Bóo, S. L. Kagan, A. Jalmovich, D. Hincapie, L. Flabbi, Y. Cruz-Aguayo, J. Cristia, and S. Berlinski (2015): "The early years: Child well-being and the role of public policy," *Inter-American Development Bank Publications (Books)*.

SEP (2010): "Orientaciones pedagógicas para la organización del trabajo en las escuelas de tiempo completo." Technical report, Dirección General de Desarrollo Curricular. Subsecretaría de Educación Básica.

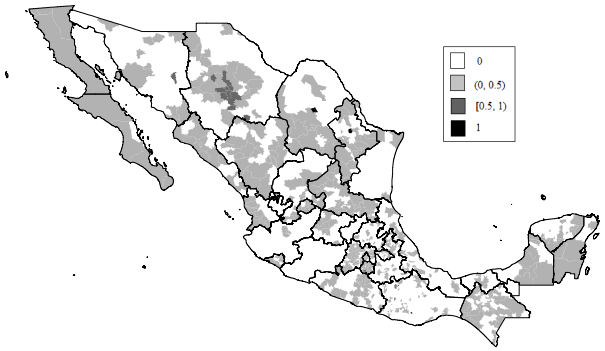
Staab, S. and R. Gerhard (2010): "Childcare service expansion in Chile and Mexico," *Working Paper*.

Figure 1: Predicted Share of FTS Seats by Academic Year

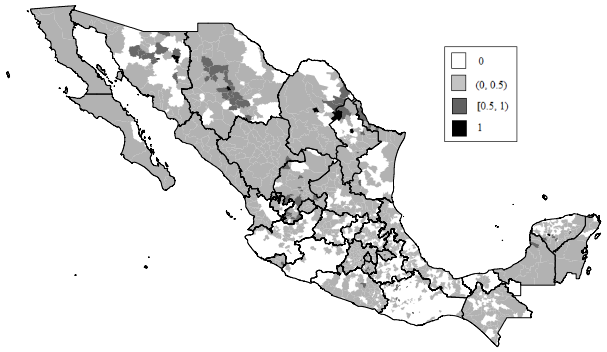
(a) 2007-2008



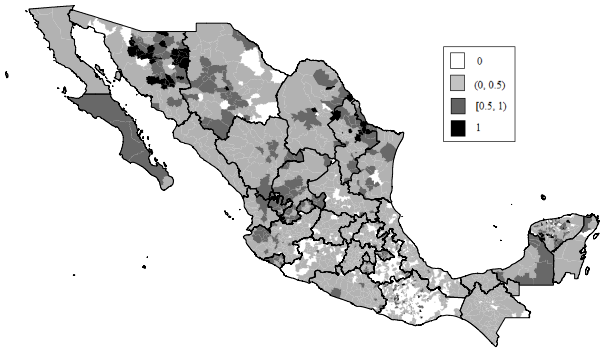
(b) 2009-2010



(c) 2012-2013



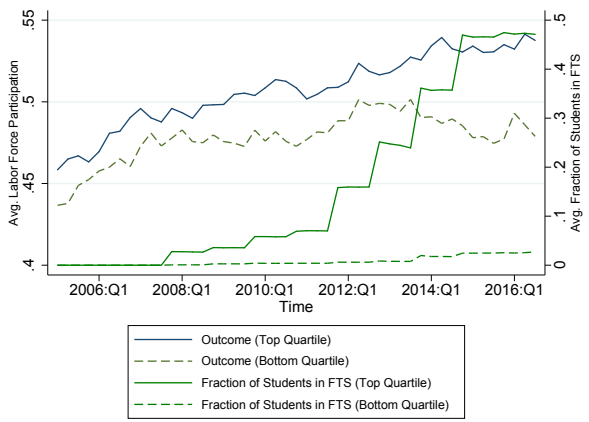
(d) 2014-2015



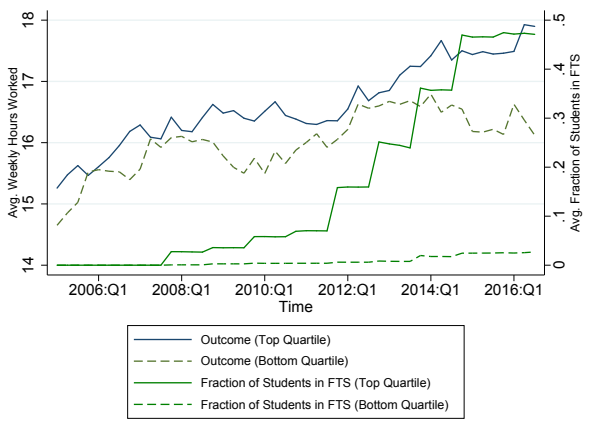
Notes: Each panel separately shows the geographic distribution of municipalities' predicted share of FTS seats in a given academic year. Predicted shares of FTS seats were constructed using annual school-level census data on enrollment and participation in the FTS program from the Ministry of Education.

Figure 2: Adjusted Female Labor Outcomes for Municipalities with High and Low Intensity of Treatment

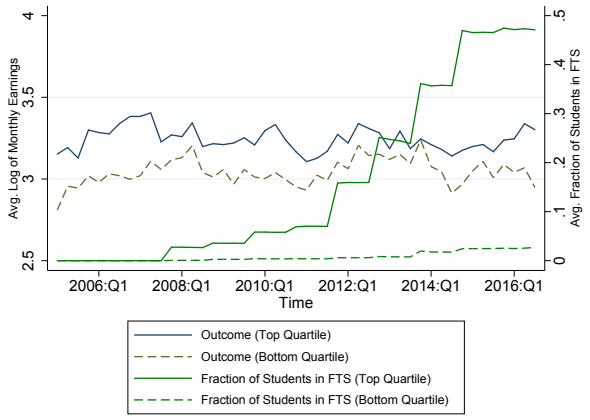
(a) Labor Force Participation



(b) Number of Weekly Hours Worked



(c) Monthly Earnings



Notes: Each panel separately shows female labor outcomes for municipalities with a high (top quartile) and low (bottom quartile) average fraction of predicted FTS seats. The left axis shows the state-by-year-by-quarter adjusted average of labor outcomes and the right axis the average fraction of predicted FTS seats. Female labor outcomes are calculated based on the National Survey of Occupation and Employment (ENOE) and the fraction of predicted seats in FTS is calculated based on census data from the Ministry of Education in Mexico. Monthly earnings are expressed in 2015 Mexican pesos.

Table 1: Long-Difference Estimated Effects of the Fraction of Seats in FTS on Female Labor Outcomes

	(1)	(2)	(3)	(4)	(5)
Panel A: Labor Force Participation					
Fraction of seats in FTS	0.040**	0.051**	0.052**	0.051**	0.051**
	(0.018)	(0.022)	(0.022)	(0.022)	(0.023)
1 Year prior				-0.018	-0.018
				(0.017)	(0.017)
2 Years prior					0.002
					(0.016)
N	218443	218443	218118	218118	218118
Panel B: Number of Weekly Hours Worked					
Fraction of seats in FTS	0.326	1.793**	1.859**	1.797**	1.767**
	(0.736)	(0.806)	(0.807)	(0.808)	(0.830)
1 Year prior				-0.678	-0.685
				(0.601)	(0.604)
2 Years prior					-0.096
					(0.590)
N	218443	218443	218118	218118	218118
Panel C: Monthly Earnings					
Fraction of seats in FTS	0.292*	0.353**	0.360**	0.364**	0.338**
	(0.151)	(0.168)	(0.167)	(0.168)	(0.172)
1 Year prior				0.042	0.036
				(0.128)	(0.129)
2 Years prior					-0.082
					(0.126)
N	218443	218443	218118	218118	218118
State-by-time fixed effects	no	yes	yes	yes	yes
Time-variant individual controls	no	no	yes	yes	yes

Notes: Each column in each panel represents a different regression. Observations are at the individual level, spanning from 2005:Q1 to 2016:Q3. All specifications include year-by-quarter fixed effects. Estimated robust standard errors in parentheses are clustered at the municipality level. Individual controls include a quadratic function of age, a quadratic function of the age of the youngest child, and a quadratic function of the number of children. Monthly earnings are expressed in 2015 Mexican pesos.

*, **, *** Significant at the 10%, 5%, and 1% levels, respectively.

Table 2: Long-Difference Estimated Effects of the Fraction of Seats in FTS on Attrition

	(1)	(2)
Fraction of seats in FTS	0.001	-0.009
	(0.047)	(0.033)
N	375283	375283
Time fixed effects	yes	yes
State-by-time fixed effects	no	yes

Notes: Each column in each panel represents a different regression. Observations are at the individual level, spanning from 2005:Q1 to 2016:Q3. Estimated robust standard errors in parentheses are clustered at the municipality level.
*, **, *** Significant at the 10%, 5%, and 1% levels, respectively.

Table 3: Long-Difference Estimated Effects of the Fraction of Seats in FTS on Female Labor Outcomes by Education

Years of schooling:	Overall	0–9	10+
	(1)	(2)	(3)
Panel A: Labor Force Participation			
Fraction of seats in FTS	0.052**	0.074***	-0.027
	(0.022)	(0.027)	(0.038)
N	218118	141972	76146
Baseline	0.461	0.384	0.623
Panel B: Number of Weekly Hours Worked			
Fraction of seats in FTS	1.859**	2.405**	-0.150
	(0.807)	(0.940)	(1.773)
N	218118	141972	76146
Baseline	15.366	12.845	20.622
Panel C: Log of Monthly Earnings			
Fraction of seats in FTS	0.360**	0.511***	-0.143
	(0.167)	(0.189)	(0.402)
N	218118	141972	76146
Beseline	2141.971	1097.225	4317.702

Notes: Each column in each panel represents a different regression. Observations are at the individual level, spanning from 2005:Q1 to 2016:Q3. All specifications include year-by-quarter fixed effects, state-by-year-by-quarter fixed effects, and individual controls. Estimated robust standard errors in parentheses are clustered at the municipality level. Individual controls include a quadratic function of age, a quadratic function of the age of the youngest child, and a quadratic function of the number of children. Nine years of schooling translates into completed junior high school, which is the median education level and was the compulsory level of education in Mexico. Monthly earnings are expressed in 2015 Mexican pesos.
*, **, *** Significant at the 10%, 5%, and 1% levels, respectively.

Table 4: Long-Difference Estimated Effects of the Fraction of Seats in FTS on Female Labor Outcomes by Poverty Level of the Locality of Residence

Poverty level:	Overall (1)	Low Poverty (2)	High Poverty (3)
Panel A: Labor Force Participation			
Fraction of seats in FTS	0.052**	-0.031	0.066**
	(0.022)	(0.048)	(0.027)
N	218118	110304	106077
Baseline	0.461	0.515	0.403
Panel B: Number of Weekly Hours Worked			
Fraction of seats in FTS	1.859**	0.887	2.428**
	(0.807)	(1.737)	(0.974)
N	218118	110304	106077
Baseline	15.366	17.235	13.315
Panel C: Log of Monthly Earnings			
Fraction of seats in FTS	0.360**	-0.329	0.462**
	(0.167)	(0.425)	(0.194)
N	218118	110304	106077
Baseline	2141.971	2808.147	1399.300

Notes: Each column in each panel represents a different regression. Observations are at the individual level, spanning from 2005:Q1 to 2016:Q3. All specifications include year-by-quarter fixed effects, state-by-year-by-quarter fixed effects, and individual controls. Estimated robust standard errors in parentheses are clustered at the municipality level. Individual controls include a quadratic function of age, a quadratic function of the age of the youngest child, and a quadratic function of the number of children. Low and high poverty localities are defined as those below and above the median poverty index, respectively. Monthly earnings are expressed in 2015 Mexican pesos.
*, **, *** Significant at the 10%, 5%, and 1% levels, respectively.

Table 5: Long-Difference Estimated Effects of the Fraction of Seats in FTS on Female Labor Outcomes by Child's Gender

Child's gender:	Overall (1)	Girls Only (2)	Girls and Boys (3)	Boys Only (4)
Panel A: Labor Force Participation				
Fraction of seats in FTS	0.052**	0.106**	0.060**	-0.000
	(0.022)	(0.043)	(0.029)	(0.043)
N	218118	54706	104101	59311
Baseline	0.461	0.506	0.424	.491
Panel B: Number of Weekly Hours Worked				
Fraction of seats in FTS	1.859**	4.738***	1.673	0.328
	(0.807)	(1.695)	(1.090)	(1.601)
N	218118	54706	104101	59311
Baseline	15.366	17.137	13.783	16.790
Panel C: Log of Monthly Earnings				
Fraction of seats in FTS	0.353**	0.722*	0.460**	-0.022
	(0.166)	(0.368)	(0.218)	(0.319)
N	218118	54706	104101	59311
Baseline	2141.971	2494.772	1802.473	2472.653

Notes: Each column in each panel represents a different regression. Observations are at the individual level, spanning from 2005:Q1 to 2016:Q3. All specifications include year-by-quarter fixed effects, state-by-year-by-quarter fixed effects, and individual controls. Estimated robust standard errors in parentheses are clustered at the municipality level. Individual controls include a quadratic function of age, a quadratic function of the age of the youngest child, and a quadratic function of the number of children. Monthly earnings are expressed in 2015 Mexican pesos.
*, **, *** Significant at the 10%, 5%, and 1% levels, respectively.

Table 6: Heterogeneous Treatment Effects on Labor Outcomes

	Women		Men	
	w/ school-age children (1)	w/o school-age children (2)	w/ school-age children (3)	w/o school-age children (4)
Fraction of seats in FTS	0.052**	0.034***	-0.019	0.010
	(0.022)	(0.013)	(0.012)	(0.013)
N	218118	421927	187227	343639
Baseline	0.461	0.395	0.973	.788
Panel A: Labor Force Participation				
Fraction of seats in FTS	1.859**	0.925	0.267	0.100
	(0.807)	(0.598)	(1.224)	(0.985)
N	218118	421927	187227	343639
Baseline	15.366	13.580	44.428	34.157
Panel C: Monthly Earnings				
Fraction of seats in FTS	0.360**	0.119	0.037	0.093
	(0.167)	(0.110)	(0.226)	(0.178)
N	218118	421927	187227	343639
Baseline	2141.971	1880.62	6914.385	5215.298

Notes: Each column in each panel represents a different regression. Observations are at the individual level, spanning from 2005:Q1 to 2016:Q3. All specifications include year-by-quarter fixed effects, state-by-year-by-quarter fixed effects, and individual controls. Estimated robust standard errors in parentheses are clustered at the municipality level. Individual controls (only for mothers' with children) include a quadratic function of age, a quadratic function of the age of the youngest child, and a quadratic function of the number of children. Monthly earnings are expressed in 2015 Mexican pesos.

*, **, *** Significant at the 10%, 5%, and 1% levels, respectively.

Table 7: Long-Difference Estimated Effects of the Fraction of Seats in FTS on Female Labor Outcomes
Restricted Sample: Municipalities with predicted share of FTS seats in the 2nd-4th quartiles

	(1)	(2)	(3)	(4)	(5)
Panel A: Labor Force Participation					
Fraction of seats in FTS	0.042**	0.049**	0.050**	0.049**	0.049**
	(0.020)	(0.023)	(0.023)	(0.023)	(0.024)
1 Year prior				-0.014	-0.014
				(0.019)	(0.018)
2 Years prior					0.002
					(0.018)
N	163214	163214	162938	162938	162938
Panel B: Number of Weekly Hours Worked					
Fraction of seats in FTS	0.737	1.657**	1.720**	1.654**	1.580*
	(0.789)	(0.821)	(0.822)	(0.825)	(0.845)
1 Year prior				-0.596	-0.620
				(0.661)	(0.665)
2 Years prior					-0.245
					(0.647)
N	163214	163214	162938	162938	162938
Panel C: Monthly Earnings					
Fraction of seats in FTS	0.257	0.275	0.280	0.282	0.241
	(0.159)	(0.174)	(0.173)	(0.175)	(0.179)
1 Year prior				0.020	0.006
				(0.136)	(0.138)
2 Years prior					-0.139
					(0.138)
N	163214	163214	162938	162938	162938
State-by-time fixed effects	no	yes	yes	yes	yes
Time-variant individual controls	no	no	yes	yes	yes

Notes: Each column in each panel represents a different regression. Observations are at the individual level, spanning from 2005:Q1 to 2016:Q3. All specifications include year-by-quarter fixed effects. Estimated robust standard errors in parentheses are clustered at the municipality level. Individual controls include a quadratic function of age, a quadratic function of the age of the youngest child, and a quadratic function of the number of children. Monthly earnings are expressed in 2015 Mexican pesos.
*, **, *** Significant at the 10%, 5%, and 1% levels, respectively.

Table 8: Long-Difference Estimated Effects of the Fraction of Seats in FTS on Female Labor Outcomes
Restricted Sample: Mothers aged 25 and older

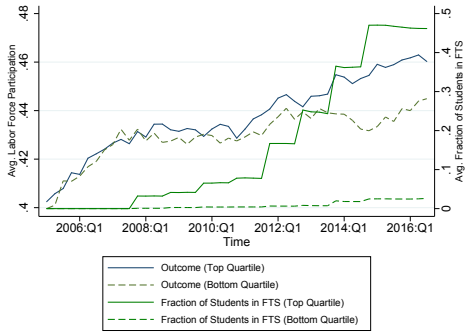
	(1)	(2)	(3)	(4)	(5)
Panel A: Labor Force Participation					
Fraction of seats in FTS	0.042**	0.053**	0.054**	0.052**	0.053**
	(0.018)	(0.023)	(0.023)	(0.023)	(0.023)
1 Year prior				-0.018	-0.018
				(0.017)	(0.017)
2 Years prior					0.002
					(0.016)
N	213970	213970	213650	213650	213650
Panel B: Number of Weekly Hours Worked					
Fraction of seats in FTS	0.464	1.948**	2.013**	1.957**	1.931**
	(0.732)	(0.806)	(0.809)	(0.810)	(0.832)
1 Year prior				-0.629	-0.636
				(0.604)	(0.609)
2 Years prior					-0.083
					(0.598)
N	213970	213970	213650	213650	213650
Panel C: Log of Monthly Earnings					
Fraction of seats in FTS	0.300*	0.352**	0.359**	0.361**	0.339*
	(0.153)	(0.173)	(0.173)	(0.174)	(0.177)
1 Year prior				0.026	0.021
				(0.132)	(0.134)
2 Years prior					-0.070
					(0.126)
N	213970	213970	213650	213650	213650
State-by-time fixed effects	no	yes	yes	yes	yes
Time-variant individual controls	no	no	yes	yes	yes

Notes: Each column in each panel represents a different regression. Observations are at the individual level, spanning from 2005:Q1 to 2016:Q3. All specifications include year-by-quarter fixed effects. Estimated robust standard errors in parentheses are clustered at the municipality level. Individual controls include a quadratic function of age, a quadratic function of the age of the youngest child, and a quadratic function of the number of children. Monthly earnings are expressed in 2015 Mexican pesos.
*, **, *** Significant at the 10%, 5%, and 1% levels, respectively.

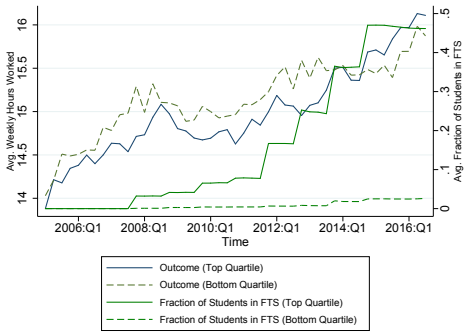
Appendix A Robustness Checks

Figure A.1: Adjusted Female without School-Age-Children Labor Outcomes for Municipalities with High and Low Intensity of Treatment

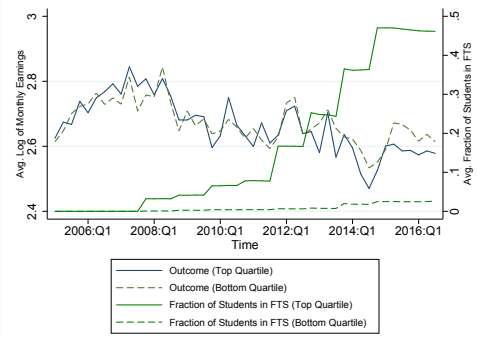
(a) Labor Force Participation



(b) Number of Weekly Hours Worked



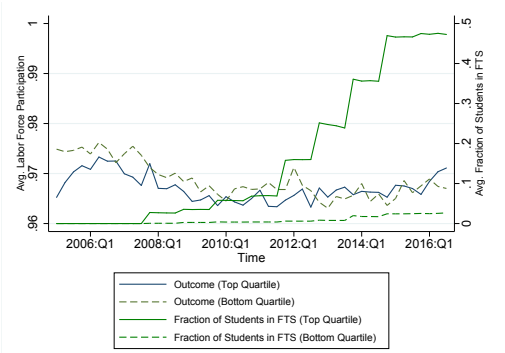
(c) Monthly Earnings



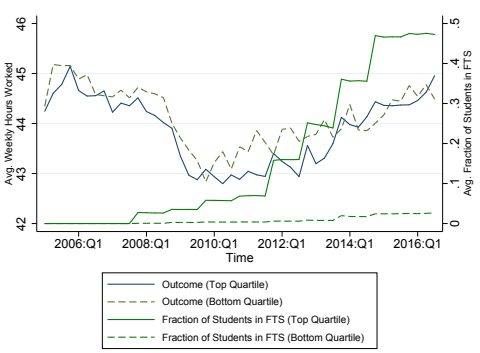
Notes: Each panel separately shows female labor outcomes for municipalities with a high (top quartile) and a low (bottom quartile) average fraction of predicted FTS seats. The left axis shows the state-by-year-by-quarter adjusted average of labor outcomes and the right axis the average fraction of predicted FTS seats. Female labor outcomes are calculated based on the National Survey of Occupation and Employment (ENOE) and the fraction of predicted seats in FTS is calculated based on census data from the Ministry of Education in Mexico. Monthly earnings are expressed in 2015 Mexican pesos.

Figure A.2: Adjusted Male with School-Age-Children Labor Outcomes for Municipalities with High and Low Intensity of Treatment

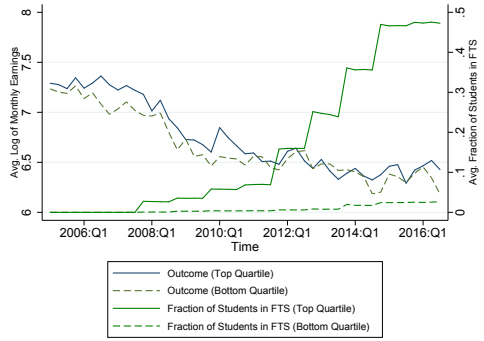
(a) Labor Force Participation



(b) Number of Weekly Hours Worked



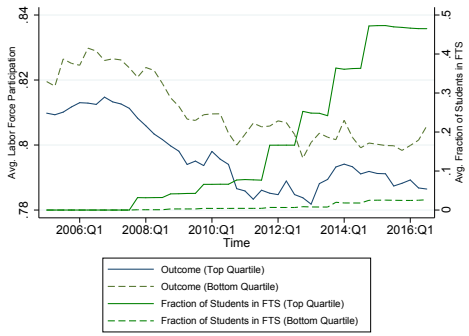
(c) Monthly Earnings



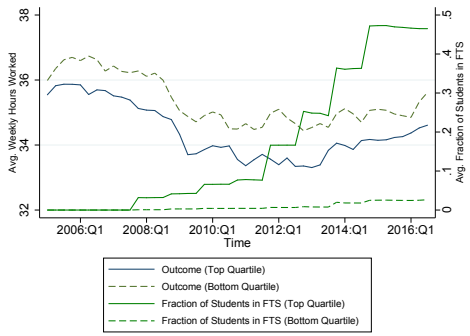
Notes: Each panel separately shows male labor outcomes for municipalities with a high (top quartile) and a low (bottom quartile) average fraction of predicted FTS seats. The left axis shows the state-by-year-by-quarter adjusted average of labor outcomes and the right axis the average fraction of predicted FTS seats. Male labor outcomes are calculated based on the National Survey of Occupation and Employment (ENOE) and the fraction of predicted seats in FTS is calculated based on census data from the Ministry of Education in Mexico. Monthly earnings are expressed in 2015 Mexican pesos.

Figure A.3: Adjusted Male without School-Age-Children Labor Outcomes for Municipalities with High and Low Intensity of Treatment

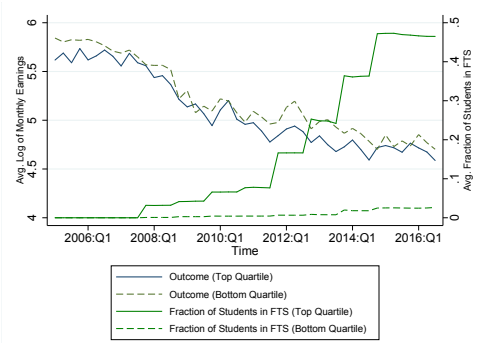
(a) Labor Force Participation



(b) Number of Weekly Hours Worked



(c) Monthly Earnings



Notes: Each panel separately shows male labor outcomes for municipalities with a high (top quartile) and a low (bottom quartile) average fraction of predicted FTS seats. The left axis shows the state-by-year-by-quarter adjusted average of labor outcomes and the right axis the average fraction of predicted FTS seats. Male labor outcomes are calculated based on the National Survey of Occupation and Employment (ENOE) and the fraction of predicted seats in FTS is calculated based on census data from the Ministry of Education in Mexico. Monthly earnings are expressed in 2015 Mexican pesos.

Table A.1: Long-Difference Estimated Effects of the Fraction of Seats in FTS on Employment

	(1)	(2)	(3)	(4)	(5)
Panel A: Employment					
Fraction of seats in FTS	0.034*	0.046**	0.047**	0.046**	0.046**
	(0.019)	(0.023)	(0.022)	(0.022)	(0.023)
1 Year prior				-0.017	-0.017
				(0.017)	(0.017)
2 Years prior					-0.000
					(0.016)
N	218443	218443	218118	218118	218118
Panel B: Formal Employment					
Fraction of seats in FTS	0.000	-0.002	-0.002	-0.002	-0.004
	(0.010)	(0.011)	(0.011)	(0.011)	(0.010)
1 Year prior				0.005	0.005
				(0.007)	(0.007)
2 Years prior					-0.006
					(0.008)
N	218443	218443	218118	218118	218118
Panel C: Informal Employment					
Fraction of seats in FTS	0.033*	0.049**	0.050**	0.048**	0.050**
	(0.019)	(0.022)	(0.022)	(0.022)	(0.023)
1 Year prior				-0.024	-0.024
				(0.017)	(0.017)
2 Years prior					0.005
					(0.016)
N	218443	218443	218118	218118	218118
State-by-time fixed effects	no	yes	yes	yes	yes
Time-variant individual controls	no	no	yes	yes	yes

Notes: Each column in each panel represents a different regression. Observations are at the individual level, spanning from 2005:Q1 to 2016:Q3. All specifications include year-by-quarter fixed effects. Estimated robust standard errors in parentheses are clustered at the municipality level. Individual controls include a quadratic function of age, a quadratic function of the age of the youngest child, and a quadratic function of the number of children. Monthly earnings are expressed in 2015 Mexican pesos.

*, **, *** Significant at the 10%, 5%, and 1% levels, respectively.

Table A.2: Long-Difference Estimated Effects of the Fraction of Seats in FTS on Female Labor Outcomes by Education

Restricted Sample: Municipalities with a predicted share of FTS seats in the 2nd-4th quartiles

Years of schooling:	Overall (1)	0–9 (2)	10+ (3)
Panel A: Labor Force Participation			
Fraction of seats in FTS	0.050**	0.073***	-0.023
	(0.023)	(0.028)	(0.040)
N	162938	103760	59170
Baseline	0.465	0.380	0.629
Panel B: Number of Weekly Hours Worked			
Fraction of seats in FTS	1.720**	2.186**	0.229
	(0.822)	(0.953)	(1.813)
N	162938	103760	59170
Baseline	15.487	12.702	20.822
Panel C: Monthly Earnings			
Fraction of seats in FTS	0.280	0.456**	-0.191
	(0.173)	(0.198)	(0.406)
N	162938	103760	59170
Baseline	2243.722	1101.452	4427.054

Notes: Each column in each panel represents a different regression. Observations are at the individual level, spanning from 2005:Q1 to 2015:Q3. All specifications include year-by-quarter fixed effects, state-by-year-by-quarter fixed effects, and individual controls. Estimated robust standard errors in parentheses are clustered at the municipality level. Individual controls include a quadratic function of age, a quadratic function of the age of the youngest child, and a quadratic function of the number of children. Nine years of schooling translates into completed junior high school, which is the median education level and the compulsory level of education in Mexico. Monthly earnings are expressed in 2015 Mexican pesos.

*, **, *** Significant at the 10%, 5%, and 1% levels, respectively.

Table A.3: Long-Difference Estimated Effects of the Fraction of Seats in FTS on Female Labor Outcomes by Poverty Level of the Locality of Residence

Restricted Sample: Municipalities with a predicted share of FTS seats in the 2nd-4th quartiles

Poverty level:	Overall (1)	Low Poverty (2)	High Poverty (3)
Panel A: Labor Force Participation			
Fraction of seats in FTS	0.050**	-0.065	0.066**
	(0.023)	(0.053)	(0.028)
N	162938	80026	81686
Baseline	0.465	0.522	0.405
Panel B: Number of Weekly Hours Worked			
Fraction of seats in FTS	1.720**	0.121	2.270**
	(0.822)	(1.849)	(0.970)
N	162938	80026	81686
Baseline	15.487	17.476	13.362
Panel C: Log of Monthly Earnings			
Fraction of seats in FTS	0.280	-0.482	0.401**
	(0.173)	(0.494)	(0.198)
N	162938	80026	81686
Baseline	2243.722	2975.425	1447.580

Notes: Each column in each panel represents a different regression. Observations are at the individual level, spanning from 2005:Q1 to 2015:Q3. All specifications include year-by-quarter fixed effects, state-by-year-by-quarter fixed effects, and individual controls. Estimated robust standard errors in parentheses are clustered at the municipality level. Individual controls include a quadratic function of age, a quadratic function of the age of the youngest child, and a quadratic function of the number of children. Low and high poverty localities are defined as those below and above the median poverty index, respectively. Monthly earnings are expressed in 2015 Mexican pesos.
*, **, *** Significant at the 10%, 5%, and 1% levels, respectively.