With a Little Help from Nurseries

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Childcare services and mothers' employment in Italy

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Abstract

This study evaluates the impact of an Italian government initiative launched in 2007, which allocated €1 billion to regional governments to enhance early childhood care services for children aged 0-2, targeting both public and private childcare options. Exploiting variations in the timing of implementation across regions, we assess the program's effectiveness in increasing the public provision of early childcare services and maternal labor market participation. Results show a significant increase in both public childcare slots and labor market participation among mothers. However, the initiative had limited effects on less-educated women, likely due to the service's relatively high costs, which may hinder broader accessibility.

Keywords: early childcare services; mothers' labor supply; staggered difference-in-difference; dynamic estimates

JEL: C21; C22; H52; H75; J13; J22

1   Introduction

In Italy, the gender gap in labour market participation is mainly driven by mothers. Difficulties in balancing employment and children's care needs are often advocated by working mothers as the major cause for resignation cases and consensual terminations of the employment relationship (Italian Labour Inspectorate, 2020). Childbirth nearly doubles the probability of quitting employment (De Philippis and Lo Bello, 2023). Among mothers who remain employed, around 20% return to work immediately after completing mandatory maternity leave, while the majority take advantage of optional parental leave, extending their time away from the labor market (Martino, 2018). Additionally, mothers who stay in the workforce often experience a decline in earnings after childbirth, primarily due to reduced working hours (Martino, 2017), an effect that can persist for several years (Casarico and Lattanzio, 2023).

Among the various political initiatives to promote mother's labour force participation, the provision of public subsidised childcare has drawn political and social attention. Many countries show a strong and positive correlation between the availability of childcare services and women's participation in the labour market(OECD, 2012). These policies aim to promote maternal employment by reducing the opportunity cost of working. To comply with the EU targets on early childcare services and female labour force participation (CEU, 2002),[1] in 2007 the Italian government implemented a three-year special plan for subsidizing public childcare services for very young children ("Piano Straordinario per lo Sviluppo dei Servizi per la Prima Infanzia" - PSSSPI).[2] The total funding reached 1 billion euros, with 621 million euros contributed by the central government to support regional territories.

In this study, we examine the impact of the PSSSPI program on the development of early childcare services and mother's participation in the labor market. To causally estimate the effects, we exploit the phased implementation of the PSSSPI program across different regions. Indeed, the program implementation varied across regions and over time as regions were required to revise their legislation concerning early childcare services and set up protocols for authorizing grant transfers before qualifying for federal

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[1] In 2006, only 11.6% of children under 3 years old were attending childcare services, falling far short of the 33% target set by the Barcelona European Council. Furthermore, female employment in 2007 was around 45%, significantly below the 50% target set by the European Commission for 2010.

[2] The plan was then further extended in 2010, 2012 and 2014.

funding. Examining the impacts of the PSSSPI program on both the expansion of childcare services and the rise in maternal employment is crucial to show that the program successfully increased maternal employment as intended, to the extent that the transfers were used to expand childcare availability.

From an empirical point of view, extensive research has examined the effectiveness of state-supported childcare programs in increasing maternal labor force participation, yielding results that differ not only across countries but also within the same country. The heterogeneity of these findings can be attributed to factors such as the age range of the target children, the maternal employment levels prior to the policy implementation, and the availability of formal childcare alternatives (Carta et al., 2023; Morrissey, 2017).

Most of the existing studies point to a large impact of public childcare expansionary reforms for children below 3 years with few exceptions. The introduction of highly subsidised childcare for very young children did prove successful in boosting female labour supply in Canada (Baker et al., 2008; Lefebvre and Merrigan, 2008), Germany (Bauernschuster and Schlotter, 2015; Müller and Wrohlich, 2020), Norway (Kunze and Liu, 2019), Spain (Nollenberger and Rodríguez-Planas, 2015) and in the Netherlands (Bettendorf et al., 2015). On the contrary, other studies in Germany and Sweden find very modest or negligible effects for children aged 1 to 3 (Busse and Gathmann, 2018; Lundin et al., 2008). In France, the effect of a childcare subsidy for children aged 2-3 is very small (Givord and Marbot, 2015) but it becomes sizeable for single mothers of 2-year-old children (Goux and Maurin, 2010).

Empirical research has also shown that state support for childcare increases maternal employment in settings with initially low levels of participation, like in Spain and Quebec (Haeck et al., 2015; Nollenberger and Rodríguez-Planas, 2015). In contrast, in contexts where maternal employment rates are already high, government support for childcare appears to have modest or negligible effects on mothers' labor market participation, like in Georgia and Oklahoma where 70% of eligible mothers were already employed (Fitzpatrick, 2010), or in Illinois where over 90% of the control group was employed (Michalopoulos et al., 2010).

Finally, the empirical evidence suggests that state support for childcare is more effective in increasing maternal employment when access barriers are low. In Norway, a large expansion of heavily subsidized public child care in 1975 had no effect on em-

ployment despite the fact that maternal employment rate was only 50% at the time of the expansion, due to the fact that the supply of child care was insufficient to meet demand both before and after the reform (Havnes and Mogstad, 2011). Conversely, a German reform in 1996 that made universal childcare available for children aged 3 to 6 significantly boosted maternal employment, especially in West Germany where public childcare was previously constrained (Bauernschuster and Schlotter, 2015).

Our results show a positive impact of the PSSSPI program on childcare coverage by about 0.3-0.5 additional slots every 100 children, on children's attendance rate by about 0.4-0.7 more children per 100 children aged 0-2, and on the percentage of municipalities providing childcare services within a province by 0.7-1.25 additional percentage points depending on the estimator used. Furthermore, our paper indicate a boost on mothers' labor force participation and employment, by respectively 2.4-3.2 and 2 percentage points, depending on the model specification, but a decrease in weekly working hours of about 6%. Notably, the gains in the labour market participation are concentrated among relatively wealthier mothers whose children were older than 24 months.

Two works are closely related to our study. Similarly to us, Giorgetti and Picchio (2021) estimate the effect of the same program (PSSSPI) on childcare supply. Evaluating the effects of the policy up to 2013, they find that childcare supply increased by 17.2% three years after the start of the program and that such impact was driven by regions located in the Center-North of Italy.

With respect to Giorgetti and Picchio (2021), we introduce several novelties. First, we extend the period analysed up to 2015, the last year that could be included, to capture the medium-term impact of the reform.[3] Second, we include two additional childcare outcome variables (take-up rate and child-to-staff ratio). Third, we utilize a recently developed heterogeneity-robust DID estimator, designed to provide unbiased estimates of treatment effects in the presence of varying treatment impacts, not only across time but also over treatment cohorts, thereby accounting for the potential variability of different groups in responses to the treatment. Finally, to validate our findings, we analyze the effects of the PSPPPI program at a more granular geographic level, specifically the 'pole'. While our childcare outcome measures are calculated at the provincial level, provinces can encompass highly heterogeneous regions. Childcare

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[3]After 2015, the municipalities' balance sheets accounting system changed and the specific information about childcare is no longer available (see Legislative Decree no. 118 of 2011).

is a highly localized market where families' demand for care must be satisfied by nearby facilities. As such, the 'pole' serving as hubs for essential services within a province may represent an alternative unit of analysis for our investigation.

This study also relates to the work of Carta and Rizzica (2018), who investigated the impact of the "Moratti" reform that introduced early access to subsidized childcare for 2-year-old children in Italy in the mid-2000s, on maternal labor force participation. Their analysis focuses on preschool services, which cater to children aged 3-6, are highly affordable and accessible, and have near-universal enrollment rates (OECD, 2017), in contrast to the current paper's context. According to the authors, the policy resulted in a 6 percentage point increase in the rate of maternal labor market participation and a 5 percentage point increase in the probability of being employed.

The paper contributes to the vast literature mentioned above on the effects of subsidized childcare provision in several ways. First, this paper focuses on mothers with children under the age of 3, a particularly relevant demographic group given the significant social and cultural pressures on Italian mothers to assume primary care-giving responsibilities. Even in a context of limited availability, as is the case in Italy, increasing the number of nursery seats may not lead to a proportional rise in toddler enrollment rates due to the strong preference for family-based care settings especially for very young children, with high heterogeneity across regions.[4] To analyze the effectiveness of the policy across the age distribution of the children, we study the heterogeneity of the results based on the age of the toddlers, distinguishing between those younger than 2 years and those between 2 and 3 years old. Second, this study examines the impact of public policies aimed at improving childcare services in a context overlooked by previous literature, except for the case of Spain (Nollenberger and Rodríguez-Planas, 2015) and Germany (Bauernschuster and Schlotter, 2015), characterized by a low female employment rate, difficulties in reconciling work and family duties, and a familistic welfare model that allocates domestic production to women.[5] This setting presents an interesting policy challenge, as efforts to encourage higher female employment through work-family reconciliation tools may be hindered by family preferences, household di-

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[4]In Italy, only 4% of infants under one year old are enrolled in educational facilities, compared to 21.9% of those over one year old and 45.8% of those 2-3 years old (Istat, 2020) In cases where both parents are employed, the grandparents take care of their grandchildren in 60.4% of cases when the youngest child is up to 2 years old (Sabbadini, 2020).

[5]According to Eurostat (2014), Italy ranks high in terms of gender disparities, with a substantial gender earnings gap. Also, exit rates of new mothers from the labour market are still very high compared to those reported in other countries (Pronzato, 2009). At the same time, women who remain employed face substantial wage penalties (Martino, 2018).

vision of chores and conformity to gender roles. Third, to fully evaluate the impact of the reform, we analyze a wide range of outcomes. Regarding child care expansion, the coverage rate captures the intensive margin of early childcare supply, the attending rate reflects the reform's impact on take-up, the percentage of municipalities providing early educational services in a province gives us the extensive margin evaluation, and the child-to-staff ratio is a key indicator of service quality. Concerning female labor supply, participation proxies for individual propensity to work, employment evaluates the equilibrium outcome, which also depends on labor demand conditions, number of hours worked and part-time work capture the changes on the intensive margin. Distinguishing across these dimensions is appropriate when analyzing welfare reforms in countries like Italy, as finding an effect on childcare service expansion does not necessarily imply an effect on mothers' labor supply.

The rest of the paper is organised as follows. Section 2 describes the Italian early childcare system and the PSSSPI Program. Section 3 presents the datasets and the sample selection. Section 4 describes the identification strategy. Section 5 shows the main results and section 6 provides evidence of the validity of the identification assumptions in our setup. Section 7 discusses the mechanisms and section 8 assess the robustness of our results. Section 9 concludes.

2   Institutional background

In Italy, mothers are entitled to five months of compulsory maternity leave (usually 2 months before and 3 after childbirth). Parents can additionally take up to 10 months of optional parental leave, with 6 months per parent, until the child is 12 years old.[6] After compulsory or optional leaves end, parents can decide to rely on informal or formal childcare. Formal childcare is divided into two separate services: daycare for children from 3 months up to 3 years of age, and preschool/kindergarten for children between 3 and 6 years. While enrollment in preschool service is almost universal (95% of 3 to 5-year-old children attend kindergarten, OECD (2017)) and provided free of charge (except for a 130 euros fee per month in case of full-time attendance (Carta and Rizzica, 2018)), less than 25% of children 0-2 attend daycare with a high heterogeneity

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[6]Only 20% of private-sector mothers return to work immediately after compulsory maternity leave, spending an average of 11 months away from the labor market using optional parental leave (Martino, 2018).

in childcare coverage and use across Italian provinces.

Policies targeting children under 3 years of age involve three different levels of governments: the national, the regional and the municipal level (Antonelli and Grembi, 2009, 2013). The national government establishes the general targets at the central level and distributes funds to regions. Regional governments establish general management criteria and specific welfare policies, while municipalities often deliver childcare services and manage direct service provision. This includes making decisions on various aspects of childcare such as determining the number of available slots, setting eligibility requirements for accessing the service, and establishing corresponding fees paid by users. Selection on applicants can cause highly rationed service (Del Boca and Vuri, 2007). In 2009, the share of applicant children who were not given a slot varied from 12% in Lombardy to more than 40% in Sicily.

Childcare fees are typically based on adjusted income levels and average around 300 euros per month for a family with an annual ISEE of about 20,000 euros.[7] This represents approximately 10% of the monthly budget for a representative family. Regional variations in daycare costs are significant, ranging from approximately 150 euros in Calabria to over 400 euros in Trentino, with higher costs typically observed in Northern regions (Cittadinanzattiva, 2011).

2.1   The PSSSPI Program

In 2002 the Barcelona European Council (Conclusions, 2002) established that, in EU member states, early childcare coverage rate should reach at least 33% of children under three years of age by 2010, with the main purpose of removing disincentives to female labor force participation. The Italian government responded with a three-year special public plan to allocate extra funds to early childcare, called "Piano Straordinario per lo Sviluppo dei Servizi per la Prima Infanzia (PSSSPI)", financed through the 2007 Budget Law (Law 296/2006). The main goals were to boost the development of both public and private early childcare services and to reduce the North/South divide in terms of early childcare availability.

Funds were allocated from central to regional governments based on a range of criteria,

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[7]The means-tested income (ISEE) is a figure that combines income and wealth values and takes into account the family composition.

like the gap between regional and national childcare service indexes, as well as regional indicators correlated to the demand of childcare services, such as the number of children under three years of age and the female employment/unemployment rate (see Table 1 for details). Additionally, regional authorities were required to co-finance the PSSSPI plan, particularly those in the South. The total regional contribution amounted to nearly 300 million euros from 2007 to 2009. The higher co-financing rate requested from Southern regions aimed to encourage a greater allocation of resources for early childhood services, drawing support from both central and regional governments, especially in areas with limited access to such services. In total, an allocation of 1 billion euros was made over the period 2007-2014, with 621 million provided by central governments, as detailed in Panel a) of Table 2. Regions were required to update their legislation on various early childcare services and establish procedures for approving grant transfers to the final service providers before they could receive national funds (Istituto degli Innocenti, 2009). Funds were allocated giving priority to regional governments that promptly approved administrative acts (Stefani et al., 2013). As a result, program implementation varied by region and time, independent of regional childcare availability and female labor supply. Table 3 and Figure 1 (left-side) display the different implementation timing across regions, making it possible to identify four "cohorts" of regions according to the year of first implementation. As shown in Figure 1, the order of adoption does not correspond to rankings in daycare availability or female employment rates (central and right maps of Figure 1), suggesting that the PSSSPI timing was exogenous.

3   Data and sample

For the empirical analysis, we use three main sources of data: the restricted-use version of the Italian Labour Force Survey (LFS), the administrative data on municipality balance sheets from the Italian Ministry of the Interior,[8] and official data from ISTAT on provincial characteristics.

The Italian Labour Force Survey (LFS) is a quarterly cross-sectional survey that gathers information on household and individual socio-demographic characteristics (such as age, education level, marital status, and municipality of residence), employment, and

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[8]https://finanzalocale.interno.gov.it/apps/floc.php/in/cod/4.

fertility (births, number of children living in the household, and their precise birth date) for both partners in the household.[9] Survey data spans the first quarter of 2004 to the last quarter of 2015, to match data on childcare availability (see later). We focus on four outcomes related to mothers' labor market status: participation in the labor market, employment, number of hours worked, and working part-time. In the Labor Force Survey data, workers are typically considered unemployed if they are absent from work for less than three months or receive at least 50% of their salary. Parental voluntary leave is usually compensated at 30% of the salary during the first six months. Less than 50% of working mothers return to employment when their infants are 6 months old, while around 75% do so by the time their babies turn 9 months of age (Survey on Births and Mothers, ISTAT 2012). This practice may introduce a measurement error issue, as mothers who opt for voluntary parental leave may not be classified as employed in the Labor Force Survey data. To mitigate the risk of misclassification, we restrict our sample to mothers aged between 20 and 45 years old, with the youngest child aged at least 9 months and not eligible for kindergarten. Such eligibility changed several times across the period analyzed.[10] In particular, in 2009, the so-called "Moratti" reform allowed toddlers aged 28 months to access public kindergarten, a service usually offered to children above 32 months old only, partially overlapping with the beneficiaries of the PSSSPI program. However, by using the birth date data for each child contained within the restricted version of the LFS, we can accurately determine their eligibility for nursery and kindergarten programs over time. The final sample counts about 97,000 observations.

The second data source consists of a panel dataset on local public finance over the years 2004 - 2015, collected by the Department of Territorial and Internal Affairs at the Italian Ministry of the Interior. It contains information on public or private (but financed by public grants) early childcare services, such as the number of available slots, the attending children, the staff members and the educators. Following closely Giorgetti and Picchio (2021), we aggregate the municipal-level data to the provincial level for two reasons.[11] First, many Italian municipalities are very small and do not offer any

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[9]The Italian LFS is a rotating panel of households: each sampled household remains in the sample for two quarters, than exits for two quarters and enters again for two final ones before leaving the sample. Of course, it can be used as a simple cross-section. The restricted-use LFS dataset includes the individual birth dates of all household members, including children.

[10]See Carta and Rizzica (2018) for a discussion on how the eligibility changed over time.

[11]As in Giorgetti and Picchio (2021), we delete 7 municipalities from the sample as they switched regions from Marche

childcare services, resulting in a reported zero coverage rate. Second, smaller munici-palities often rely on nearby larger ones to meet their childcare needs due to the lack of available services. As a result, the PSSSPI may have a big effect in larger municipalities that can expand their childcare services to all families nearby but a negligible effect in smaller ones unable to meet the critical size required for implementation. We focus on four outcome variables related to childcare services: the coverage rate in the province, defined as the ratio between the supply of slots of early childcare services and the popu-lation aged 0-2;[12] the attending rate (or take-up rate), defined as the ratio between the number of children attending daycare and the population aged 0-2 in the corresponding province;[13] the percentage of municipalities providing the services in the province; the child-to-staff ratio, calculated only for those municipalities having a positive coverage rate. The final dataset consists of 1320 province-year observations.

The third source of data consists of time-varying provincial characteristics collected by ISTAT: the gross domestic product at the provincial level, its growth rate and the population density. Panel A of Table 4 reports summary statistics for the sample of mothers from LFS data. About 58% of women participate in the labor market and 52% are employed, working for around 27 hours per week on average. Among those employed, about 40% of mothers work part-time. Most women are married, and mothers have slightly higher education levels than fathers on average. Panel B reports the descriptive statistics of the childcare variables at the provincial level and provincial characteristics. Over the period analysed, Italian provinces offer, on average, 5.1 available spots in public early childcare per every 100 toddlers aged 0-2. The attendance rate is close, with an average of 4.6 toddlers per 100 children aged 0-2 enrolled in early care facilities. Furthermore, only about one-fourth (24%) of municipalities per province offer at least one childcare service. Lastly, the children-to-staff ratio is approximately seven children per educator.[14]

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to Emilia-Romagna as a consequence of a referendum held in 2006.

[12]Data on the population aged 0-2 is obtained from the Atlante Statistico dei Comuni for the period 2002-2012 and are downloaded from the online archive *Popolazione e Famiglie* after 2012.

[13]We should be cautious when using the attendance rate in daycare centers due to children potentially being counted multiple times (Antonelli and Grembi, 2009). In some cases, local governments miscalculate attendees by counting daycare attendance based on school year, which begins in September and ends in June, spanning across two different years, leading to some children being counted twice (i.e. from September to December and from January to June). Also, if two children alternate using the service within the same year, with the first one staying for 3 months and then being replaced by the second child, they are both included in the count. However, according to Antonelli and Grembi (2009), only 328 out of 8111 municipalities for the year 2005 suffer from these problems.

[14]The children-to-staff ratio is the average per province; those municipalities without at least one facility are excluded from the computation.

4   Empirical Strategy

Assessing the causal impact of public funding on both childcare services and women's participation in the labor market is challenging. Many socioeconomic factors can indeed affect both dimensions. For instance, preferences for family-related policies within society may lead to increased interest from politicians in financing such services, resulting in higher coverage or attendance rates at early childcare facilities and an increase in female employment. Additionally, wealthier regions are more likely to have better social welfare systems as well as to offer more job opportunities for women. Conversely, areas with higher female participation in the workforce may create a greater demand for childcare services, suggesting a reverse causal relationship. Therefore, directly comparing pre- and post-program implementation outcomes or carrying out a cross-sectional analysis across regions that have already implemented the program and those that have not, does not allow disentangling the program's effects from other contributing variables.

To overcome this issue, we leverage on the variation in central government funding allocation to regions based on their administrative capacities (as explained in Section 2.1). The phased implementation of the PSSSPI program across regions allows us to employ a staggered difference-in-differences design to assess the causal effect of the program on early childcare services expansion and mothers' participation in the labor market (Athey and Imbens, 2022; Callaway and Sant'Anna, 2021; Stevenson and Wolfers, 2006). The identifying assumption is that in the absence of the PSSSPI program, the childcare supply and the mothers' labor supply would have changed similarly in regions experiencing a faster transfer of funds relative to regions receiving funds later (see section 6 for possible violations of this assumption).

Specifically, to analyze the public supply of childcare services in province p in year t, we estimate the following regression using a two-way fixed-effects (TWFE) estimator:

$$y_{pt} = \alpha_0 + \alpha_1 reform_{rt} + \alpha_2 Z'_{pt} + \eta_t + \omega_r + \epsilon_{pt} \tag{1}$$

where y_{pt} is the outcome of interest, namely the daycare coverage rate or the daycare attending rate or the percentage of municipalities providing the service or the child-to-staff ratio. $reform_{rt}$ is an indicator variable equal to 1 if the program is implemented

in region r at time t, and remains 1 for all subsequent years following the first implementation. Z'_{pt} is a vector of provincial time-varying controls: the real GDP and the real GDP growth capture the economic conditions within province, while the population density accounts for differences in the pool of users' size and sparsely populated area. η_t are year-fixed effects, that control for time-variant unobserved characteristics that remain constant across all regions within a particular year. ω_r are regional fixed effects that control for time-invariant unobserved determinants of childcare outcomes. The key coefficient of interest is α_1 which estimates the effect of the PSSSPI program on the alternative childcare-related outcome variables while controlling for provincial characteristics.[15]

When analyzing the reform effect on mothers' labor supply, we take advantage of the quarterly schedule of the LFS and consider the quarter in which the reform is implemented, as reported in Table 3. We estimate the following model for mother i, living in province p, in quarter t using a TWFE estimator:

$$y_{ipt} = \beta_0 + \beta_1 reform_{rt} + \beta_2 X'_{it} + \beta_3 Z'_{pt} + \eta_t + \omega_r + \epsilon_{ipt} \tag{2}$$

where y_{ipt} is the outcome of interest, namely an indicator for whether the mother is employed in quarter t, or she is in the labor force (either employed or looking for a job in the previous 4 weeks), or she is working part-time in quarter t (vs not working). Additionally, the variable y_{ipt} may also indicate the weekly hours worked for employed mothers. $reform_{rt}$ is equal to 1 if the program was implemented in quarter t in region r. X'_{it} is a vector of individual and household time-varying characteristics which includes the mother's age and educational level, marital status, number of children, and father's education level (if present). Z'_{pt} is defined as in equation 1. η_t are quarter×year fixed effects that control for any macroeconomic shocks and ω_r are regional fixed effects that control for time-invariant unobserved determinants of labor market outcomes for mothers living in the same region. The key coefficient of interest β_1 estimates the effect of the implementation of the PSSSPI program on mothers' labor market outcomes while controlling for individual and provincial characteristics. These estimates can be

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[15]Because fixed effects are at the regional level, one may think to other provincial-level variables to include. Fundamentally, here we follow the same specification as in Giorgetti and Picchio (2021); nonetheless, we prove that our results are robust to the inclusion of other provincial-level demographic characteristics, such as the fraction of women in the fertile age range which could be considered ad a proxy for childcare service demand (results are available on request).

interpreted as the reduced-form effects of the reform on mothers' labor market outcomes.

However, when the effects of treatment are heterogeneous to treatment groups and time periods, which is likely when a reform takes time to fully take effect, the TWFE estimator may yield biased estimates of the average treatment effect on the treated (ATT). Therefore, we additionally estimate equations 1 and 2 using the Callaway and Sant'Anna (2021) estimator, which produces estimates robust to heterogeneity across groups and/or periods.[16]

The baseline model in equations (1) and (2) implies that the PSSSPI program had an immediate impact on childcare services and mothers' labor market outcomes, with these effects being constant over time. However, as highlighted in Giorgetti and Picchio (2021), the program might require some time to achieve its full potential. Indeed, the funds allocated by the central government were utilized to enhance existing services and build new facilities, with the construction of new facilities taking longer than improving existing services. To examine the different timing aspects of the reform, we estimate the event-study version of the TWFE model with indicators for the time before and after the PSSSPI program implementation year (or quarter). This allows us to account for potential delays in responses by municipalities or mothers to policy changes, and to assess whether the program had a lasting or only a transient effect on childcare outcomes and maternal labor market participation.

To account for the dynamic impact of the program, equation (1) is modified as follows:

$$y_{pt} = \beta_0 + \sum_{\tau=-5}^{4} \beta_\tau reform_{r,t-\tau} + \beta_2 Z'_{pt} + \eta_t + \omega_r + \epsilon_{pt} \qquad (3)$$

where the binary treatment is replaced by a set of indicator variables, $reform_{r,t-\tau}$, that is the number of periods relative to the PSSSPI program's first implementation that span from -5 up to 4.[17] The lag coefficients capture the dynamic effects of the PSSSPI program while the lead coefficients help assess the identifying assumption of

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[16]The Callaway and Sant'Anna (2021) estimator computes the average treatment effect on each treatment-timing group treated, in each period in which the group is treated, obtaining a group timing-specific estimate. Such estimates are obtained through a simple 2x2 DD estimator which compares changes in the outcome for the treated group (early implementing regions) in a reference period relative to the same change in a control group of units not yet treated (late implementing regions), excluding "bad" treatment-control pairs. Then, all the estimates are averaged to obtain the overall causal effect of the treatment. The last cohort of treated in 2010 does not have a timing-specific estimate and cannot contribute to the average ATTs, because there is no not-yet treated group left to be used as a control.

[17]The exact number of periods that is possible to estimate depends on the estimator used; the TWFE can exploit the entire period available, i.e. from 2004 to 2015, while the Callaway and Sant'Anna (2021) uses only those post-reform periods that include only no-yet treated units as controls for the newly treated.

no differential pre-trends; if treated and control groups were indeed following parallel trends in the absence of the policy, we should expect the reform to have a non-significant effect before its implementation.

Equation (2) is modified as follows:

$$y_{ipt} = \beta_0 + \sum_{\tau=-23}^{20} \beta_\tau reform_{r,t-\tau} + \beta_2 X'_{it} + \beta_3 Z'_{pt} + \eta_t + \omega_r + \epsilon_{ipt} \qquad (4)$$

where $reform_{r,t-\tau}$ are indicator variables equal to 1 if the program was implemented in the region r at time $t - \tau$, where τ is the number of quarters relative to the event.[18] As before, we also estimate equations (3) and (4) using the dynamic ATT's proposed by Callaway and Sant'Anna (2021), where the ATT's are estimated for each quarter (year) relative to the period first treated, across all cohorts, to account for heterogeneity across groups and/or periods.

Finally, in such difference-in-differences settings, the error terms are likely to be serially correlated within regions, which may invalidate classical inferential procedures. To control for within-cluster error correlation, standards errors are clustered at the regional level - the policy variation level - in all regression models.[19] Moreover, clustering at the region level also accounts for the multiple observations of the same province, which are fully nested within regions, thus resulting in more conservative standard error (Cameron et al., 2012). Yet, if the number of clusters is small (the rule of thumb defines small a number as little as less than 50) a cluster-robust variance estimator can still be biased as the inference framework relies on asymptotic distribution theory with many groups. To alleviate such a problem, we apply a multiplicative WildBootstrap procedure with 999 repetitions using mammen approach (Cameron et al., 2008).

5 Results

Table 5 displays estimation results of the reform effect on childcare outcomes, assuming a time-constant impact of the policy, as in equation (1). Panel A shows the results based on the TWFE estimator, Panel B those based on the Callaway and Sant'Anna (2021)

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[18]Again, the exact number of periods that can be estimated depends on the estimator used. See previous footnote.

[19]Clustering is not performed at the region-year level because, under the reasonable assumption that the within-year clustering is driven by shocks that affect all observations in a given year similarly (Cameron and Miller, 2015), year fixed effects absorb within-year clustering.

estimator. Both the coverage and attendance rates increase after the implementation of the PSSSPI program. Specifically, the average number of daycare places increases by a range of 0.3-0.5 slots per 100 children aged 0-2 depending on the estimator used, corresponding to a rise of about 7-12% compared to the pre-policy mean. The PSSSPI program boosts children's attendance rate by about 0.4-0.7 per 100 children aged 0-2. Such an increase corresponds to a rise of about 10-17% compared to the pre-policy mean. Additionally, the percentage of municipalities offering early childcare services increased by 0.7-1.25 percentage points, or about 3-5.3% compared to the pre-policy mean. No significant change is observed in the child-to-staff ratio.

Figure 2 shows the dynamic effects of the policy (see Tables A1 and A2 for the complete set of estimates obtained by employing the dynamic version of the TWFE and the dynamic ATT's proposed by Callaway and Sant'Anna (2021), respectively). Except for the child-to-staff ratio, the other childcare-related outcomes exhibit an almost immediate increase following the implementation of the PSSSPI intervention, and these positive effects persist or even strengthen over the subsequent two-year period. This indicates that the beneficial impact of the policy reform on childcare coverage outcomes extended beyond the immediate short-run. If we compare the two sets of estimates, the TWFE estimates are larger and more imprecise than the Callaway and Sant'Anna (2021) estimates. Looking at the coverage rate, Panel A of Figure 2 shows an increase of about 0.4 additional slots for every 100 toddlers in the year of implementation of the reform. After two years, this number more than doubles to over 0.8-1.5 additional places, according to the estimator used. The attendance rate (Panel B) follows a relatively comparable path, despite the estimates are less precise. The year the PSSSPI policy is introduced, the number of toddler enrolled in childcare facilities increases by 0.2 to 0.7 per 100 children, with a continuing upward trend in the subsequent years. This finding is important because the increased availability of childcare services for children under three does not necessarily lead to proportional enrollment, as parents may opt for family-based care arrangements. As expected, the PSSSPI program exhibits growing efficacy in its goal of expanding childcare services (Panel C). The initial rise in the proportion of municipalities providing childcare is modest, less than 1.0 percentage points. However, the impact increases significantly in the first year after the implementation of the PSSSPI, reaching 1.7 to 2.3 percentage points, depending on

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the estimation method. This expansion continues in the second year, with a further increase of 2.2 to 4 percentage points. Our findings regarding childcare coverage and the fraction of municipalities offering childcare services align with previous research by Picchio et al. (2021). Conversely, no significant effects are found for the child-to-staff ratio (Panel D). This proves that the expansion of childcare capacity did not come at the cost of reducing the staff-to-children ratio, which could make the service less attractive to families.

Table 6 shows the effects of the PSSSPI program on mothers' labour market outcomes under the assumption of a constant impact of the policy. Maternal labor market participation increases by 2.4-3.2 percentage points according to the estimator used, which corresponds approximately to a 4.3-5.8% rise compared to the pre-policy mean; additionally, employment rises by around 2 percentage points which corresponds to a growth of about 4% compared to the pre-policy mean. However, the reform reduces weekly working hours by 2-6%, but the effect is significant only in Panel B. Overall, the PSSSPI program seems to increase mothers' labor force participation, but it also leads employed women to decrease their hours of work. A possible explanation for these results is that affordable public childcare can be seen as a subsidy that reduces the costs for mothers, potentially encouraging non-working mothers to join the labor force. However, the subsidy may also incentivize full-time working mothers to decrease their work hours or shift to part-time employment, as the hours of public childcare do not align well with full-time schedules in Italy (Del Boca and Vuri, 2007). To investigate if the data support this interpretation, we estimate equation (2) using as an outcome a variable equal to 1 if the mother is working part-time, and zero if not working. The estimates presented in column (4) of Table 6 support our hypothesis, as the implementation of the PSSSPI program is associated with a nearly 3 percentage point increase in part-time employment (although significant only for the TWFE estimator), i.e. an increase of about 8% with respect to pre-policy mean.

We estimate equation 4 to assess whether the effects of the PSSSPI program are short-lived or long-lasting. The results reported in Figure 3 show that labor force participation, employment and part-time levels only begin to rise consistently across the two estimator after 9 quarters following the implementation of the reform (see Tables A3 and A4 for the complete set of estimates obtained using the dynamic version of the

TWFE and the dynamic ATT's proposed by Callaway and Sant'Anna (2021), respectively).[20] The analysis also indicates that the impact on weekly working hours becomes statistically significant approximately between 6 and 10 months after the policy intervention and continues to persist, with a reduction ranging from 4% to 17%, depending on the estimation approach utilized, throughout the subsequent period.

Overall, the findings indicate that the PSSSPI program leads to a reduction in working hours among employed women and encourages them to remain in the labor force following childbirth. However, the impact on labor force participation, employment, and part-time work are observable only after nearly two years.

6   Potential threats to identification

The validity of the DID approach relies on three assumptions: i) parallel trend assumption; ii) exogeneity of the timing of program implementation; iii) no anticipation. The first assumption assumes that in the absence of the program, the supply of public early childcare services and the mothers' labor outcomes would have been the same trend between provinces in regions that had already implemented the program (treated) and provinces in regions that did not yet (controls). The second assumption assumes that the implementation timing is exogenous with respect to the supply and the demand of public early childcare services and to mothers' labor supply. The third assumption assumes that the regions did not anticipate the start of the program investing more or postponing some investments on childcare services. Similarly, households should not have been able to somehow forecast the PSSSPI implementation before it occurred and to change their behaviour accordingly.

To test the first assumption, we closely follow the approach in Giorgetti and Picchio (2021) by examining the lead indicators for the program implementation shown in Figure 2 to control whether the treated and control provinces exhibit similar trends for the four childcare outcomes prior to the program implementation (Autor, 2003). The results show that almost all the coefficients before the PSSSPI implementation are close to zero and not statistically significant, suggesting the absence of any pre-existing

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[20]The TWFE estimator exhibits a relatively flat trend compared to the Callaway and Sant'Anna (2021). This can be due to the fact that the TWFE approach uses previously treated units as controls for newly treated ones, which results in a downward bias in a context of dynamically increasing treatment effects.

trends. Almost all the coefficients (the fifth lag for the coverage rate and for the children-to-staff ratio and the second lag for the attending rate) that are significant are situated far from the initial implementation of the reform and they are not consistently significant across estimators, suggesting that the first issue is not a concern in our context. When we test the same assumption on mothers' labor market outcomes, Figure 3 shows that the only significant coefficients before the PSSSPI implementation are very far away in time, or are significant only according to the TWFE estimator (the sixth lag for estimates of the part-time work and the fifth and fourth lag for the estimates of the hours worked).

Concerning the second assumption, we rely on the results reported in Giorgetti and Picchio (2021), who run three different tests to support the claim that the variation in the timing of the program implementation across regions can be largely attributed to the effectiveness of regional governments. First, they show that government quality had a significant impact on reducing implementation timing (see Table 6 in Giorgetti and Picchio (2021)). Second, they observe that none of the characteristics of politicians (such as the proportion of female or educated politicians) are significantly associated with the timing of program implementation (see Table 7 in Giorgetti and Picchio (2021)). Lastly, they show that the differences in regional program implementation are not influenced by regional heterogeneity in the demand or supply of early childcare services (see Table 8 in Giorgetti and Picchio (2021)).

Concerning the third assumption, we run a placebo test to rule out anticipation effects. Specifically, we exclude all observations after the PSSSPI program implementation and assume that the PSSSPI reform takes place two years earlier than it actually does. The results in Table 7 show that the effects for all the outcomes are very small and no longer statistically significant, thus reassuring on the validity of our findings.

Another source of potential concern may be the presence of other time-varying sources of variation correlated with the staggered implementation of the policy. Other childcare-related policies were in place between 2004-2015, as summarised in Table 8, but they should not represent a threat in our case for several reasons. The tax credit for childcare users established in 2005 was issued to all potential beneficiaries at the national level in the same year. As a consequence, it should not interfere with the estimation of the reform effect that exploits the staggered implementation across regions as iden-

tification strategy. Additionally, from 2013, the Cohesion Action Plan (PAC) allocated resources to address territorial imbalances by enhancing childcare services in four European Convergence Objective regions. Municipalities, as final beneficiaries, had to meet organizational and planning requirements to access these resources. Due to differences in municipal administrative capacities, the resources were likely not distributed simultaneously within region. If municipalities were clustered according to their administrative capacities in a way that aligned with regional patterns, then our results may be confounded by the PAC. To rule out this possibility, we restrict the analysis to the 2004-2012 period (before the PAC introduction), and show that results remain largely unchanged (see Table 9). Finally, the "Moratti" reform, which granted universal preschool access for children age 2 and above starting in 2009, may impact our findings if our sample includes mothers with more than one child, the youngest in daycare and the other(s) in preschool, making it difficult to disentangle the impacts of the two policy changes. To address this issue, we exclude from the sample mothers with more children, of which at least one eligible for kindergarten. The results reported in Table 10 show that the effects are larger in magnitude than those reported in Table 6, except for the outcome related to working hours, showing that our findings are not confounded by the presence of another reform.

Finally, the identification of the reform effects may be threatened if the PSSSPI program incentivized families to migrate towards the regions with faster PSSSPI implementation, in order to benefit from the childcare expansion. This could generate a compositional change in the treated and comparison groups. Also, the PSSSPI program might have impacted fertility, which in turn influences female labour market outcomes. To address these concerns, we estimate equation 2 using as an outcome a variable equal to 1 if the mother changes the region of residence in the year before the interview and 0 otherwise, and or the number of children per mother. Neither of the two outcomes are affected by the reform (results available on request).

7 Mechanisms

Our findings concerning the impact of the PSSSPI program on the expansion of childcare services align with the conclusions drawn in Giorgetti and Picchio (2021). However,

the results obtained for mothers' labor market outcomes are less pronounced than those reported in Carta and Rizzica (2018), which examined the effects of the Moratti reform on mothers with children over 28 months enrolled in kindergarten services.

There are two potential explanations for this discrepancy. The first is related to the rising financial burden of childcare borne by families. Specifically, the proportion of family budgets allocated to daycare services increased from 17.5% in 2003 to 20% by 2014, as documented in Ufficio Valutazione Impatto (2018). As mentioned in section 2, childcare expenses represent a significant portion of household budgets. The combination of increasing prices and the effects of the 2007 financial crisis on households' disposable income may have dampened the effectiveness of the PSSSPI program. Indeed, data from the European Union Statistics on Income and Living Conditions (EU-SILC, ISTAT 2020) show that early childcare attendance tends to be much lower for families characterized by low income, severe material deprivation, low educational qualifications, or parental unemployment. To investigate this issue we split the sample based on family socioeconomic status. Families are classified as having low socioeconomic status if the mother has a low level of education or the father holds a low-skilled occupation. Table 11 shows that for low-income families, the impact of the PSSSPI program is weaker and not significantly different from zero for any of the labor market outcomes considered. For wealthier families instead, the point estimates are larger in magnitude than those reported in Panel B of Table 6 and significantly different from zero, except for hours worked.

The second explanation relates to the effectiveness of the policy across the age distribution of the children. If families tend to use more childcare services for older children, the fact that the Moratti reform came into effect during the same period as the PSPPPI program might have reduced the number of potential beneficiaries of the PSSSPI program by granting access to toddlers aged 28 months (instead of 32) to public kindergarten, a service almost universal and cheaper than daycare, diminishing the overall PSPPPI effect. To verify this hypothesis, we distinguish between those younger than 24 months and those between 24 and 32 (or 28 after the "Moratti" reform) months old. Table 12 shows that effects are indeed substantially smaller and less significant for younger children. While this evidence cannot be conclusive on the potential displacement effect of the "Moratti" reform, it highlights that excluding older children from

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the reform makes the PSSSPI program much less effective in promoting mothers' labor supply.

8   Robustness

In this section, we test the robustness of our results to changes to the unit of analysis, the control variables used and to placebos test. First, we examine the robustness of childcare-related outcomes to different levels of data aggregation. Using provinces as the unit of analysis may hide territorial heterogeneity in childcare provision, as provinces often include areas with different supply. Nevertheless, distance is a crucial factor in shaping family decisions of childcare facilities (Del Boca and Vuri, 2007). This means that if the number of municipalities providing childcare in a province increases, but the service availability remains concentrated in one part of the province, the service will likely be inaccessible to some families. To address this issue, we use "poles" as units of aggregation instead of province. Poles are municipalities (or group of neighboring municipalities) that serve as hubs for essential services within a province, and offer at the same time at least one high school and one technical institute, at least one hospital (which offers, beyond first aid, general surgery, orthopedics and traumatology among other services), and a railway station. To perform the alternative data aggregation, we use data coming from two different sources: (1) data from the Italian National Governmental Agency For Territorial Cohesion that provides a classification of municipalities according to their distance in access from essential services, and (2) data from the Italian National Institute of Statistics (ISTAT) on the distances between Italian municipalities. In order to determine which municipalities are served by a single "pole", where the "pole" is able to provide a range of services to geographically proximate smaller municipalities, we match the Agency's classification with the matrices of the distances in travel times between all Italian municipalities provided by ISTAT.

The final sample includes 258 poles, observed over 11 years from 2004 to 2015. Regions include several provinces and poles which are in turn made up of a certain number of municipalities. Each province and each pole belongs to one and only one region.[21] With only two exceptions, each province is made of multiple poles. We estimate equation 1

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[21] For additional details of the classification of municipalities according to their distance in access from essential services, see http://old2018.agenziacoesione.gov.it/it/arint/index.html.

using data collapsed at the pole level. Since a pole can include municipalities belonging to different provinces, we use regional time-varying controls instead of provincial time-varying controls. The results are similar to the ones reported in Table 5 (available upon request), suggesting that our results do not depend on the level of data aggregation.

Second, we perform a placebo test to check if the PSSSPI program also affects fathers' labor market outcomes.[22] Indeed, the effects on mothers may be a combined response of mothers' and fathers' reactions to the reform. The results (available on request) show that fathers are not affected by the reform, confirming a gender division of roles in Italian families, where mothers mainly take primary responsibility for their children.

9 Conclusions

The paper investigates the effects of a three-year special public plan providing extra-funds (PSSSPI) for early formal childcare services on childcare expansion and maternal labor supply in Italy. The program's implementation varied across regions and over time as regions were required to revise childcare legislation and establish grant authorization protocols to qualify for federal funding. We leverage the staggered implementation of the PSSSPI program across different regions to estimate the causal impact of interest.

The results show that the allocated funds were effective in increasing available seats, attendance rate and the share of municipalities providing the service and that the mothers responded to the investment in daycare facilities by increasing their participation in the labor market but reducing the hours of work. Compared to existing studies, these results are in line with some of the previous European studies (Goux and Maurin, 2010; Nollenberger and Rodríguez-Planas, 2015). However, the impact of the reform could have been more pronounced had the service been more affordable or if the beneficiaries had not simultaneously been subject to another widely adopted reform. The analysis suggests that certain groups with traditionally lower labor force participation, such as less educated women, remain largely unaffected, likely due to the relatively high cost of the service.

To achieve a substantial turnaround, policymakers should likely need to complement supply-side reforms with supportive demand-side policies, for example granting more

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[22]We do not consider hours of work and part time because in Italy men usually have full time jobs.

income-based subsidies or modifying the criteria for access to child care, avoiding to penalize unemployed mothers.

Also, our findings emphasise the importance of distinguishing the impacts of daycare funding based on the child's age, as the demand for toddlers' care services may be more elastic than the demand for older children's care. Indeed, the rise in early care provision seems almost ineffective for mothers of very young toddlers, potentially suggesting that the preference for parental care is too strong for children under 2 years of age. As a consequence, supporting only the supply of childcare may be insufficient to increase childcare enrolment and mothers' labor supply towards the intended targets. Finally, public policies aimed at the same target population, like the Moratti reform and the PSSSPI program for children between 28 and 32 months, must be closely aligned to ensure the effective and efficient allocation of public resources and prevent any unintended displacement effects.

Figures

Figure 1: Geographic variation in treatment timing, daycare coverage rate and female employment rate
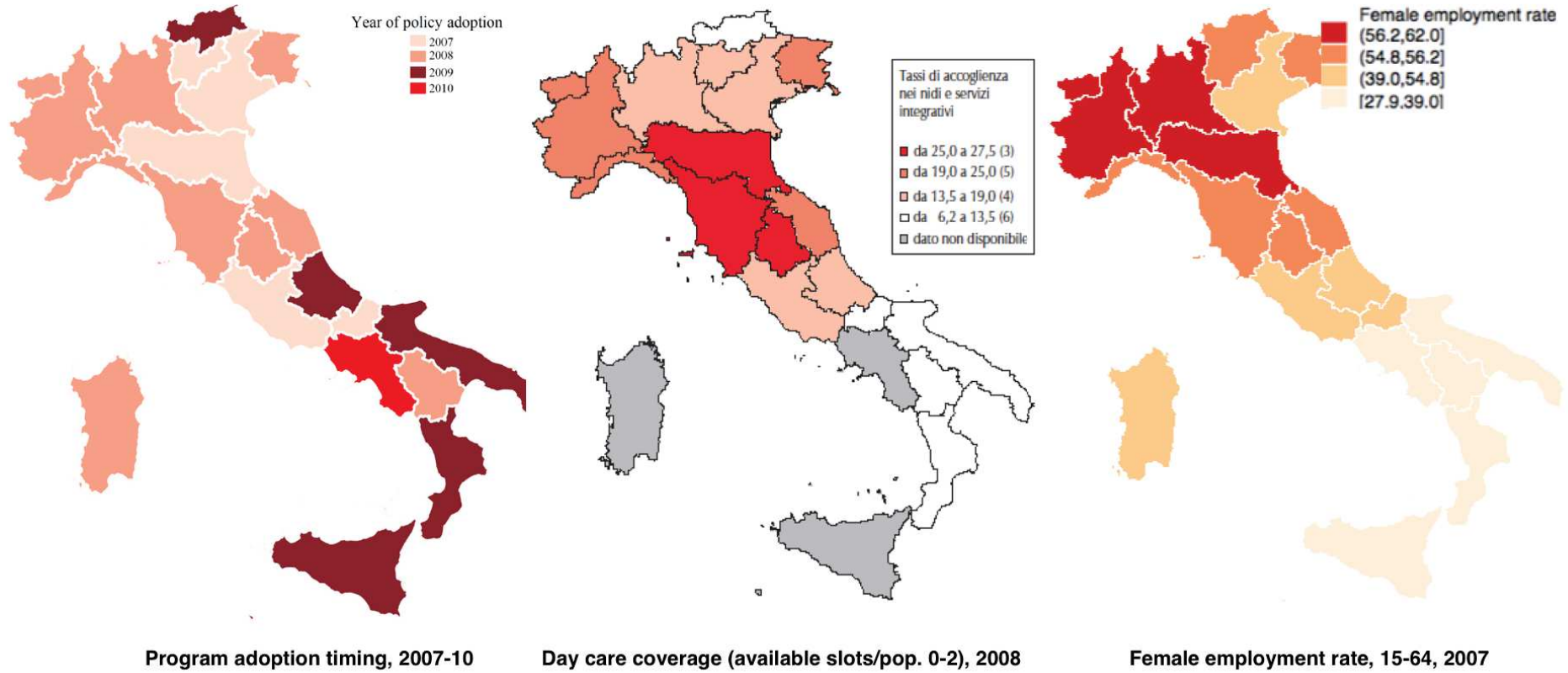
Source: Giorgetti and Picchio (2021), Istituto degli Innocenti (2008) and authors' elaboration on ISTAT data.

Figure 2: Dynamic effects of the PSSSPI program on childcare outcomes
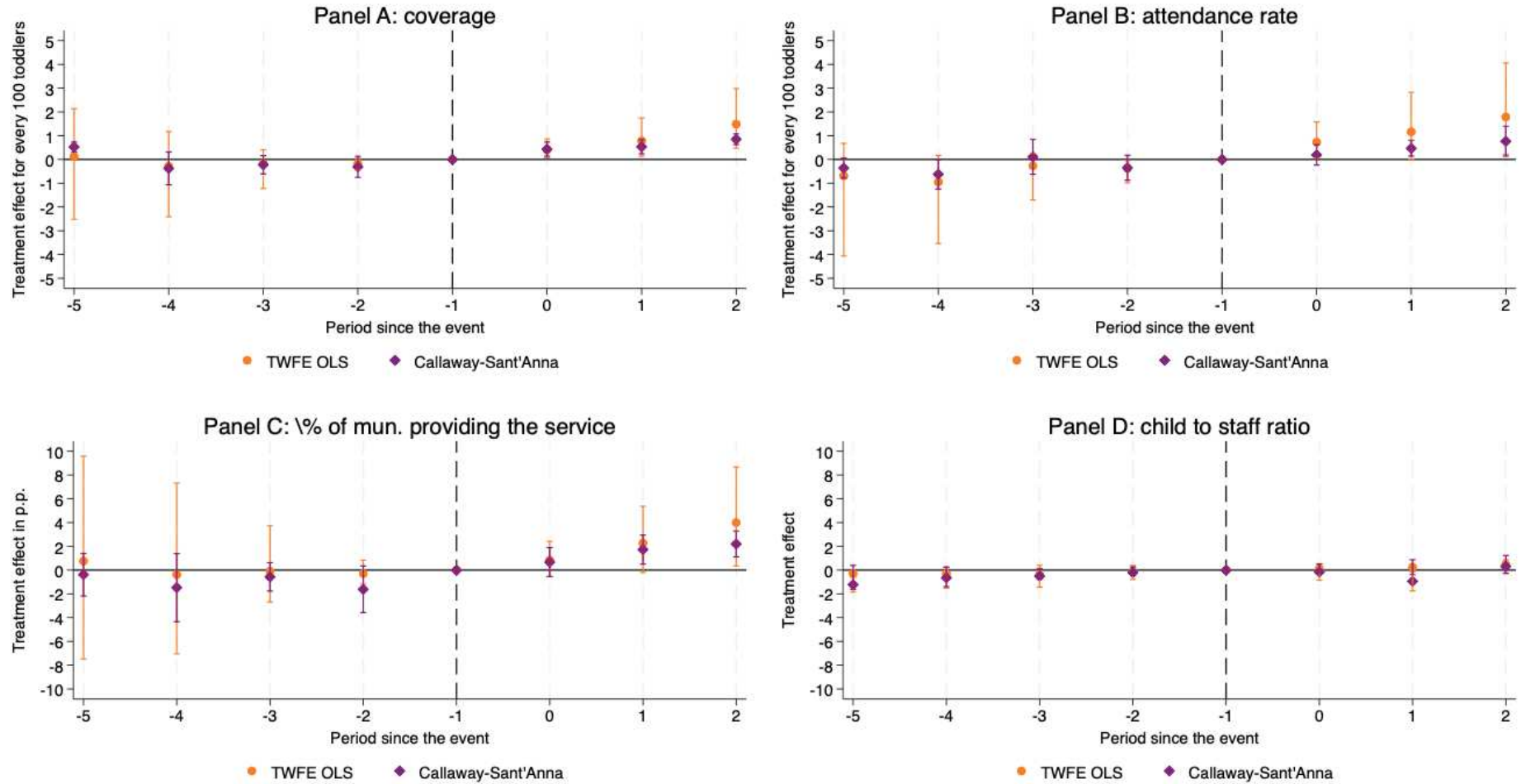
Note: Post-reform periods shown in the figures are limited to those that allow robust comparison, i.e. that include the only not-yet treated units as controls for the newly treated.

Figure 3: Dynamic effect of the PSSSPI program on mothers' labour market outcomes
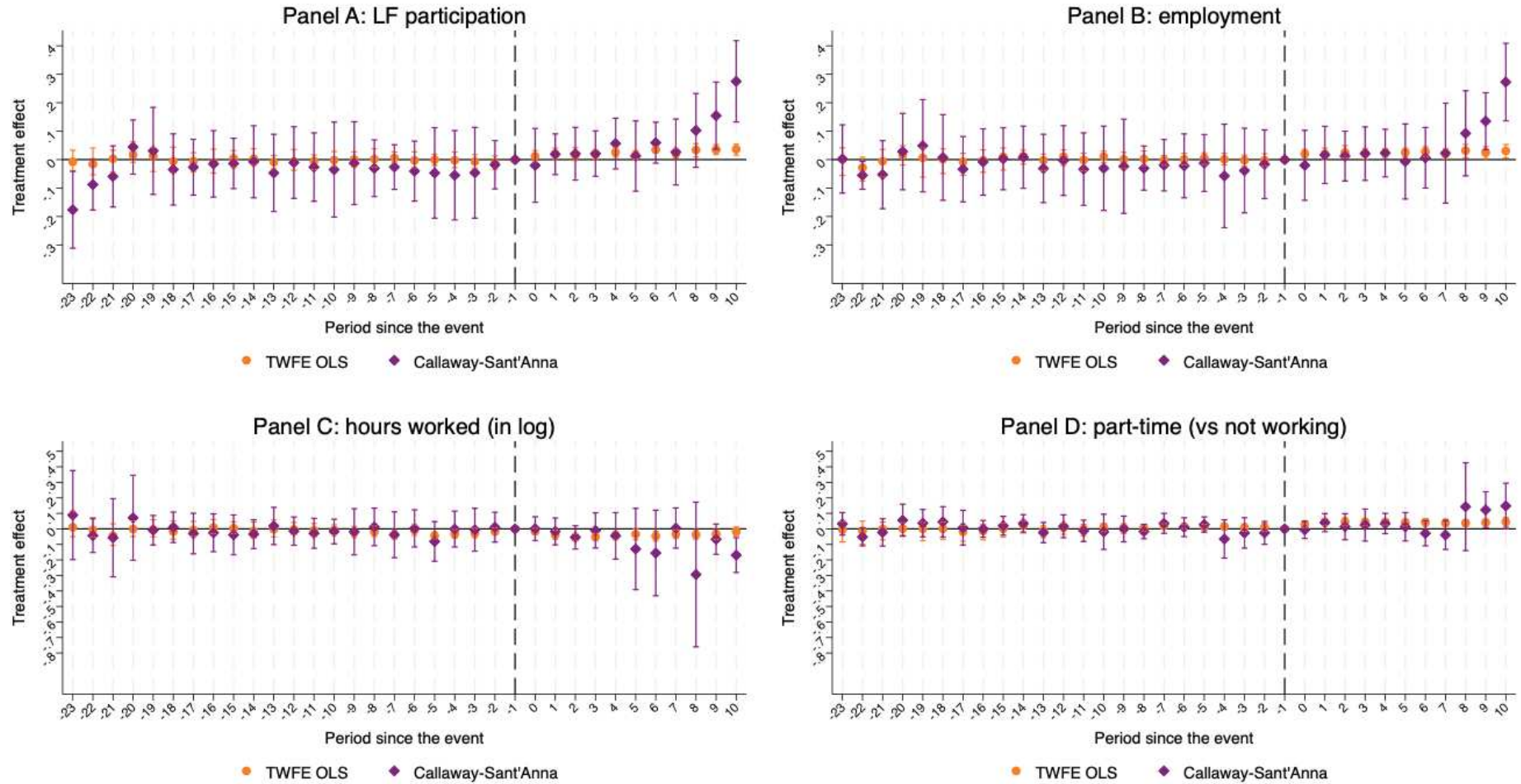
Note: Post-reform periods shown in the table are limited to those that allow robust comparison, i.e., those that include the only not-yet treated units as controls for the newly treated.

Tables

Table 1: Regional criteria to assign funds to municipalities

Regions	Demographic criteria	Criteria related to the use of the service (nr of children attending or enrolled)	Criteria related to structural and operational characteristics of childcare facilities	Residual criteria
Abruzzo			*	
Basilicata		*		
Calabria	*			*
Campania	*			
Emilia Romagna		*		
Friuli Venezia Giulia	*		*	*
Lazio		*	*	*
Liguria	*			
Lombardia				*
Marche		*	*	*
Molise		*		*
Piemonte				*
Provincia di Bolzano		*		
Provincia di Trento		*	*	
Puglia		*		*
Sardegna	*			*
Sicilia				*
Toscana	*	*		
Umbria		*	*	*
Valle d'Aosta			*	*
Veneto		*	*	*

Source: Antonelli and Grembi (2009)

Table 2: Special public budget plan for the development of early childcare services from 2007 until 2014 (thousand of euro)

| | a) National funds, 2007-2014 | | | | | | | b)National and regional funds, 2007-2009 | | | |
	2007	2008	2009	2010	2012	2014	2007 -14	National funds	Regional funds	Co-financing (%)	Total
Piemonte	7,211	10,634	5,151	7,181	5,026	359	35,562	22,996	6,899	30	29,895
Valle d Aosta	335	494	239	288	203	15	1,575	1,069	321	30	1,390
Lombardia	17,515	25,830	12,511	14,150	9,905	708	80,618	55,855	16,757	30	72,612
Alto Adige	926	1,366	661	824	574	41	4,392	2,995	898	30	3,893
Trentino	939	1,385	671	844	588	42	4,469	2,953	886	30	3,839
Veneto	9,239	13,626	6,599	7,277	5,096	364	42,201	29,464	8,839	30	38,303
Friuli-Venezia Giulia	2,322	3,424	1,658	2,193	1,533	110	11,241	7,405	2,221	30	9,626
Liguria	2,461	3,629	1,758	3,019	2,114	151	13,131	7,847	2,354	30	10,201
Emilia-Romagna	8,401	12,390	6,001	7,084	4,956	354	39,186	26,792	8,038	30	34,830
Toscana	6,885	10,153	4,918	6,555	4,592	328	33,431	21,956	6,587	30	28,543
Umbria	1,504	2,218	1,074	1,642	1,148	82	7,669	4,797	1,439	30	6,236
Marche	2,892	4,265	2,066	2,645	1,855	133	13,857	9,224	2,767	30	11,991
Lazio	12,127	17,883	8,662	8,600	6,020	430	53,722	38,672	11,602	30	50,274
Abruzzo	3,158	4,657	2,256	2,451	1,715	123	14,361	10,073	7,800	77.4	17,873
Molise	946	1,395	676	798	560	40	4,415	3,016	3,029	100.4	6,045
Campania	23,941	35,306	17,100	9,983	6,986	499	93,815	76,347	88,848	116.4	165,195
Puglia	12,516	18,457	8,940	6,977	4,886	349	52,125	39,913	37,678	94.4	77,591
Basilicata	1,681	2,478	1,200	1,230	861	62	7,512	5,359	4,916	91.7	10,275
Calabria	6,966	10,273	4,976	4,112	2,877	206	29,409	22,214	24,813	111.7	47,027
Sicilia	14,857	21,910	10,612	9,185	6,433	460	63,457	47,379	40,877	86.3	88,256
Sardegna	3,178	4,687	2,270	2,960	2,072	148	15,316	10,136	3,590	35.4	13,726
Total	140,000	206,462	100,000	100,000	70,000	5,000	621,462	446,462	281,158	63	727,620

Note: panel a) includes only funds from the central government over the period 2007-2014, panel b) details the split between national, regional and co-financed funds over the period 2007-2009. Source: Giorgetti and Picchio (2021)

Table 3: Year of first implementation of the PSSSPI Program

Regions	2007	2008	2009	2010	Quarter/Year
Piemonte		x			II quarter 2008
Valle d'Aosta		x			IV quarter 2008
Lombardia		x			IV quarter 2008
Provincia di Trento	x				II quarter 2007
Veneto	x				IV quarter 2007
Friuli Venezia Giulia		x			IV quarter 2008
Liguria		x			II quarter 2008
Emilia Romagna	x				IV quarter 2007
Provincia di Bolzano			x		I quarter 2009
Toscana		x			I quarter 2008
Umbria		x			III quarter 2008
Marche		x			III quarter 2008
Lazio	x				IV quarter 2007
Abruzzo			x		III quarter 2009
Molise	x				IV quarter 2007
Campania				x	I quarter 2010
Puglia			x		II quarter 2009
Basilicata		x			II quarter 2008
Calabria			x		IV quarter 2009
Sicilia			x		IV quarter 2009
Sardegna		x			IV quarter 2008

Source: authors' own elaboration on Istituto degli Innocenti (2009)

Table 4: Summary statistics

	mean	sd
Panel A		
participation	0.58	0.49
employed	0.52	0.50
hours worked per week	27.27	14.14
employed part-time	0.30	0.46
mother - age	33.74	5.075
mother -single mothers	0.06	0.23
mother -mothers in a couple	0.94	0.23
mother -married	0.84	0.37
mother - up to middle school education	0.34	0.47
mother - high school education	0.46	0.50
mother - tertiary degree	0.20	0.40
father - no education or missing	0.06	0.23
father - up to mid. school education	0.41	0.49
father - high school education	0.40	0.49
father - tertiary degree	0.13	0.40
nr child	1.69	0.70
Observations	96993	
Panel B		
coverage rate	0.051	0.05
attending rate	0.046	0.04
fraction of mun. providing the service (%)	24.40	19.31
children-to-staff ratio	7.22	2.03
real gdp per capita	27938.83	8452.92
real gdp per capita growth	-0.01	0.03
population density	368.29	569.20
Observations	1320	

Note: Panel A reports summary statistics of the sample of mothers from
LFS data. The variable *hours worked per week* is measured only for work-
ing mothers (50,804 observations). The variable *employed part-time (vs not
working)* is equal 1 if the mother is employed part-time (20,140 observa-
tions) and equal 0 if not working (46,189 observations). In the absence of
the father, related variables are set to zero. Panel B reports the descriptive
statistics of the sample of provinces from the Italian Department of Terri-
torial and Internal Affairs data and provincial characteristics from ISTAT
data. Population density is people per sq. km.

Table 5: Estimates of the effect of the PSSSPI program on childcare services

	Coverage rates	Attending rate	% of mun. providing the service	Child-to-staff ratio
	(1)	(2)	(3)	(4)
Panel A: Two-way fixed effects				
Reform	0.003**	0.007**	0.679	0.095
	(0.001)	(0.003)	(0.592)	(0.186)
N	1,320	1,320	1,320	1,275
Panel B: Callaway and Sant'Anna estimator				
Reform	0.005***	0.004**	1.254***	-0.409
	(0.001)	(0.001)	(0.372)	(0.260)
N	660[a]	660[a]	660[a]	638[a]
Baseline	0.042	0.040	22.4	6.970

Note: *Reform* is the average treatment effect on the treated for all groups across all periods. Wildbootstrap standard errors clustered at the regional level are reported in parentheses. Significance levels are indicated by $* < .1$, $** < .05$, $*** < .01$. Covariates include provincial controls (GDP, GDP growth rate and population density at the provincial level). [a] The sample is reduced because after 2009 no cohort is left untreated.

Table 6: Estimates of the effect of the PSSSPI program on mothers' labour market outcomes

	LF participation	Employment	Working hours (in log)	Part-time
	(1)	(2)	(3)	(4)
Panel A: Two-way fixed effects				
Reform	0.024***	0.022***	-0.019	0.030***
	(0.007)	(0.006)	(0.010)	(0.007)
N	96,993	96,993	45,039	66,329
Panel B: Callaway and Sant'Anna estimator				
Reform	0.032***	0.020*	-0.060***	0.023
	(0.010)	(0.011)	(0.020)	(0.017)
N	54,748[a]	54,748[a]	54,748[a]	37,246[a]
Baseline	0.553	0.500	3.350	0.275

Note: ATT is the average treatment effect on the treated for all groups across all periods. Wildbootstrap standard errors clustered at the regional level are reported in parentheses. Significance levels are indicated by $* < .1$, $** < .05$, $*** < .01$. Covariates include individual (age, age squared, marital status, education level), households (father education level, nr. of children) and provincial controls (GDP, GDP growth rate and population density at the provincial level). [a] The sample is reduced because after 2009 no cohort is left untreated.

Table 7: Test of the no anticipation effect

Panel A: childcare outcomes

	Coverage rate	Attending rate	%of mun. providing the service	Child to staff ratio
	(1)	(2)	(3)	(4)
Fake reform	-.003	-.002	-.007	-.102
	(0.001)	(0.002)	(0.005)	(0.230)
N	451	451	451	431

Panel B: mothers' labour market outcomes

	LF participation	Employment	Working hours (in log)	Part-time
Fake reform	-.003	.007	.014	-.015
	(0.006)	(0.007)	(0.011)	(0.013)
N	42,900	42,900	19,124	19,124

Note: Only pre- reform periods are selected and a fake reform year is assigned to each region, i.e. the program first implementation year is attributed two years before the true implementation period. Wild-bootstrap standard errors are reported in parentheses. Significance levels are indicated by $* < .1$, $** < .05$, $*** < .01$. Covariates include provincial controls (GDP, GDP growth rate and population density at the provincial level) for childcare-related outcomes, together with individual (age, age squared, marital status, education level) and households (father education level, nr. of children) controls for labour market-related outcomes.

Table 8: Other policies

LAW OF REFERENCE	INSTRUMENT	BENEFICIARIES	GOALS	TRANSFERS (millions of euros)
23/12/2005 n. 266	Tax credit	Childcare users	Reduction of services' cost burden by families	Tax credit of 19% with a maximum amount of 632 euros per child
Moratti reform - 2003, but only came into full effect in 2009	Early access to kindergarten for 2 years old children	Kindergarten schools	Consequence of the introduction of early access to primary school aimed to reduce the age of high school completion from 19 to 18 years old to align the Italian school system with the other European ones	No additional public resources
N.a.	From 2013, Cohesion Action Plan (PAC) included an early childcare financing to four Southern regions	Ministry of Interior directly transferred funds to municipalities without regions' intermediation	Addressing territorial imbalances and enhancing the provision of childcare services in the region covered by the European Convergence Objective: Calabria, Campania, Puglia, Sicily	About 339

Source: Antonelli and Grembi (2009)

Table 9: Estimates of the effect of the PSSSPI program restricting the time window to 2005-2012

Panel A: childcare outcomes

	Coverage rate	Attending rate	% of mun. providing the service	Child to staff ratio
	(1)	(2)	(3)	(4)
Reform	0.005***	0.004***	1.253***	-0.408
	(0.000)	(0.001)	(0.368)	(.259)
N	660	660	660	638

Panel B: mothers' labour market outcomes

	LF participation	Employment	Working hours (in log)	Part-time
Reform	0.032***	0.020*	-0.060***	0.023
	(0.010)	(0.011)	(0.020)	(0.017)
N	45,225	45,225	21,073	30,786

Note: Results are estimated using the Callaway and Sant'Anna (2021) estimator only. Wildbootstrap standard errors are reported in parentheses. Significance levels are indicated by $* < .1$, $** < .05$, $*** < .01$. Covariates include provincial controls (GDP, GDP growth rate and population density at the provincial level) for childcare-related outcomes, together with individual (age, age squared, marital status, education level) and households (father education level, nr. of children) controls for labor market-related outcomes.

Table 10: Estimates of the effect of the PSSSPI program excluding mothers with more children, and at least one eligible for the Moratti-reform

	LF participation	Employment	Working hours (in log)	Part-time
	(1)	(2)	(3)	(4)
Reform	0.07***	0.053***	-0.029	0.032
	(0.014)	(0.014)	(0.023)	(0.025)
N	41,970	41,970	19,935	27,931

Note: Results are estimated using the Callaway and Sant'Anna (2021) estimator only. The sample is restricted to mothers whose youngest child is eligible to attend childcare, but with no children eligible to enter kindergarten. Wildbootstrap standard errors are reported in parentheses. Significance levels are indicated by $* < .1$, $** < .05$, $*** < .01$. Covariates include provincial controls (GDP, GDP growth rate and population density at the provincial level) for childcare-related outcomes, together with individual (age, age squared, marital status, education level) and households (father education level, nr. of children) controls for labour market-related outcomes.

Table 11: Estimates of the effect of the PSSSPI program by mothers' socio-economic status

	LF participation	Employment	Working hours (in log)	Part-time
	(1)	(2)	(3)	(4)
Panel A: Mothers with low socio-eeconomic status				
Reform	0.002	-0.010	-0.096	-0.002
	(0.022)	(0.020)	(0.039)	(0.0029)
N	20,114	20,114	5,832	16,330
Panel B: Mothers with high socio-economic status				
Reform	0.056***	0.047***	-0.043	0.054**
	(0.015)	(0.018)	(0.027)	(0.025)
N	33,301	33,301	18,996	19,995

Note: Mothers with low socio-economic status are defined as those low educated or member of a household in which the father is employed in a low-skilled job. Vice versa for mothers with high socio-economic status. Wildbootstrap standard errors are reported in parentheses. Significance levels are indicated by $* < .1$, $** < .05$, $*** < .01$. Covariates include provincial controls (GDP, GDP growth rate and population density at the provincial level), individual (age, age squared, marital status, education level) and households (father education level, nr. of children) controls.

Table 12: Estimated effects of the PSSSPI reform by age of the youngest child

	LF participation	Employment	Working hours (in log)	Part-time
	(1)	(2)	(3)	(4)
Panel A: Mothers whose youngest child is under 24 months old				
Reform	0.015	0.002	-0.018	0.019
	(0.013)	(0.015)	(0.030)	(0.021)
N	40,134	40,134	18,616	27,304
Panel B: Mothers whose youngest child is above 24 months old				
Reform	0.064**	0.041	-0.179***	0.048
	(0.029)	(0.033)	(0.044)	(0.036)
N	14,596	14,596	6,806	9,886

Note: Wildbootstrap standard errors are reported in parentheses. Significance levels are indicated by $* < .1$, $** < .05$, $*** < .01$. Covariates include provincial controls (GDP, GDP growth rate and population density at the provincial level), individual (age, age squared, marital status, education level) and households (father education level, nr. of children) controls.

Table 13: Nr. of municipalities, poles and provinces per region

Regions	Municipalities	Poles	Provinces
Piemonte	1206	23	8
Valle d'Aosta	74	1	1
Lombardia	1531	33	12
Provincia autonoma di Trento	217	1	1
Veneto	579	23	7
Friuli Venezia Giulia	217	8	4
Liguria	235	8	4
Emilia Romagna	333	25	9
Toscana	280	27	10
Umbria	92	6	2
Marche	236	14	5
Lazio	378	10	5
Abruzzo	305	7	4
Molise	136	3	2
Campania	550	20	5
Puglia	258	17	6
Basilicata	131	2	2
Calabria	409	9	5
Sicilia	390	12	9
Sardegna	377	6	8
Provincia autonoma di Bolzano	116	3	1
Total	8050	258	110

Note: the table reports summary statistics of the sample created from the merge of: 1) data from the Italian National Governmental Agency For Territorial Cohesion that provides a classification of municipalities according to their distance in access from essential services, and (2) data from the Italian National Institute of Statistics (ISTAT) on the distances between Italian municipalities.

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Appendix

Table A1: Childcare outcomes: TWFE dynamic effects

	Coverage rate	Attendance rate	% of mun. providing the service	Child-to-staff ratio
Time to treatment: -5 years	0.001	-0.007	0.761	-0.290
	[-0.025 , 0.021]	[-0.041 , 0.007]	[-7.487 , 9.590]	[-1.626 , 0.399]
Time to treatment: -4 years	-0.003	-0.009	-0.380	-0.308
	[-0.024 , 0.012]	[-0.035 , 0.002]	[-7.045 , 7.320]	[-1.391 0.259]
Time to treatment: -3 years	-0.002	-0.003	-0.087	-0.365
	[-0.012 , 0.004]	[-0.017 , 0.003]	[-2.686 , 3.733]	[-0.745 0.137]
Time to treatment: -2 years	-0.002	-0.004**	-0.294	-0.097
	[-0.004 , 0.000]	[-0.010 , -0.001]	[-1.168 , 0.833]	[-0.470 0.278]
Time to treatment: -1 year	-	-	-	-
Time to treatment: 0 year	0.004**	0.007*	0.843	0.124
	[0.001 , 0.009]	[0.001 , 0.016]	[-0.542 , 2.414]	[-0.251 0.508]
Time to treatment: +1 year	0.008**	0.012*	2.273	0.249
	[0.001 , 0.017]	[0.000 , 0.028]	[-0.202 , 5.372]	[-0.377 0.871]
Time to treatment: +2 years	0.015 ***	0.018**	4.005*	0.475
	[0.005 , 0.030]	[0.002 , 0.041]	[0.351 , 8.673]	[-0.273 1.233]

Note: Significance levels are indicated by ∗ < .1, ∗∗ < .05, ∗∗∗ < .01. Wildbootstrap confidence intervals are reported in brackets. Post-reform periods shown in the table are limited to those that allow robust comparison, i.e. those that include the only not-yet treated units as controls for the newly treated.

Table A2: Childcare outcomes: Callaway and Sant'Anna (2021) dynamic effects

	Coverage rate	Attendance rate	% of mun. providing the service	Child-to-staff ratio
Time to treatment: -5 years	0.005***	-0.004	-0.382	-1.217***
	[0.003 , 0.007]	[-0.008 , 0.001]	[-2.176 , 1.411]	[-1.838 , -0.595]
Time to treatment: -4 years	-0.004	-0.006	-1.470	-0.645
	[-0.011 , 0.003]	[-0.012 , 0.000]	[-4.343 , 1.403]	[-1.519 , 0.229]
Time to treatment: -3 years	-0.002	0.001	-0.568	-0.508
	[-0.006 , 0.002]	[-0.006 , 0.008]	[-1.767 , 0.630]	[-1.415 , 0.399]
Time to treatment: -2 years	-0.003	-0.003	-1.615	-0.202
	[-0.008 , 0.001]	[-0.009 , 0.002]	[-3.575 , 0.344]	[-0.785 , 0.382]
Time to treatment: -1 years	-	-	-	-
Time to treatment: 0 year	0.004***	0.002	0.673	-0.162
	[0.001 , 0.007]	[-0.002 , 0.006]	[-0.541 , 1.888]	[-0.861 , 0.538]
Time to treatment: +1 year	0.005***	0.005***	1.733***	-0.940***
	[0.002 , 0.008]	[0.001 , 0.008]	[0.507 , 2.959]	[-1.744 , -0.136]
Time to treatment +2 years	0.009***	0.008***	2.198***	0.311
	[0.006 , 0.011]	[0.001 , 0.014]	[1.111 , 3.285]	[-0.238 , 0.859]

Note: Significance levels are indicated by ∗ < .1, ∗∗ < .05, ∗∗∗ < .01. Wildbootstrap confidence intervals are reported in brackets. Post-reform periods shown in the table are limited to those that allow robust comparison, i.e. those that include the only not-yet treated units as controls for the newly treated.

Table A3: Mothers' labour market outcomes: TWFE

	LF participation	Employment	Hours worked	Part-time (vs not working)
Time to treatment: -23 quarters	-0.008	0.001	0.010	-0.005
	[-0.039 , 0.033]	[-0.055 , 0.042]	[-0.050 , 0.116]	[-0.084 , 0.048]
Time to treatment: -22 quarters	-0.016	-0.028	-0.006	-0.011
	[-0.053 , 0.041]	[-0.075 , 0.009]	[-0.054 , 0.073]	[-0.100 , 0.050]
Time to treatment: -21 quarters	0.003	-0.005	-0.044	-0.001
	[-0.044 , 0.032]	[-0.061 , 0.036]	[-0.107 , 0.032]	[-0.071 , 0.043]
Time to treatment: -20 quarters	0.017	0.015	-0.000	0.001
	[-0.009 , 0.062]	[-0.019 , 0.049]	[-0.050 , 0.052]	[-0.042 , 0.040]
Time to treatment: -19 quarters	0.013	0.006	-0.004	0.001
	[-0.042 , 0.043]	[-0.062 , 0.041]	[-0.051 , 0.059]	[-0.077 , 0.041]
Time to treatment: -18 quarters	-0.006	0.002	-0.017	0.000
	[-0.047 , 0.044]	[-0.049 , 0.038]	[-0.067 , 0.050]	[-0.067 , 0.044]
Time to treatment: -17 quarters	-0.005	-0.007	-0.007	-0.019
	[-0.043 , 0.024]	[-0.055 , 0.022]	[-0.048 , 0.049]	[-0.080 , 0.021]
Time to treatment: -16 quarters	-0.010	-0.002	0.009	-0.013
	[-0.047 , 0.036]	[-0.044 , 0.034]	[-0.032 , 0.060]	[-0.070 , 0.030]
Time to treatment: -15 quarters	0.005	0.009	0.001	0.001
	[-0.029 , 0.031]	[-0.036 , 0.041]	[-0.029 , 0.047]	[-0.053 , 0.037]
Time to treatment: -14 quarters	0.003	0.012	-0.014	0.022
	[-0.020 , 0.039]	[-0.015 , 0.034]	[-0.059 , 0.044]	[-0.027 , 0.054]
Time to treatment: -13 quarters	-0.008	-0.002	-0.003	-0.011
	[-0.032 , 0.015]	[-0.038 , 0.019]	[-0.051 , 0.057]	[-0.056 , 0.020]
Time to treatment: -12 quarters	-0.006	0.011	-0.003	0.007
	[-0.038 , 0.036]	[-0.020 , 0.034]	[-0.038 , 0.041]	[-0.035 , 0.038]
Time to treatment: -11 quarters	-0.005	-0.001	-0.009	-0.001
	[-0.035 , 0.016]	[-0.040 , 0.023]	[-0.051 , 0.035]	[-0.044 , 0.029]
Time to treatment: -10 quarters	-0.002	0.010	-0.008	0.013
	[-0.024 , 0.029]	[-0.010 , 0.030]	[-0.039 , 0.026]	[-0.018 , 0.034]
Time to treatment -9 quarters	0.001	0.001	-0.022	0.007
	[-0.026 , 0.027]	[-0.032 , 0.025]	[-0.056 , 0.017]	[-0.029 , 0.033]
Time to treatment -8 quarters	0.002	0.003	-0.018	0.006
	[-0.026 , 0.038]	[-0.022 , 0.030]	[-0.048 , 0.019]	[-0.016 , 0.028]
Time to treatment -7 quarters	0.006	-0.002	-0.040	0.018
	[-0.011 , 0.027]	[-0.020 , 0.014]	[-0.065 , -0.007]	[0.000 , 0.034]
Time to treatment -6 quarters	-0.003	0.001	-0.008	0.014*
	[-0.028 , 0.027]	[-0.018 , 0.022]	[-0.042 , 0.027]	[0.001 , 0.027]
Time to treatment -5 quarters	-0.000	0.006	-0.044***	0.012
	[-0.020 , 0.019]	[-0.017 , 0.024]	[-0.064 , -0.021]	[-0.011 , 0.029]
Time to treatment -4 quarters	-0.002	0.001	-0.033*	0.015
	[-0.029 , 0.026]	[-0.018 , 0.022]	[-0.060 , -0.004]	[-0.007 , 0.034]
Time to treatment -3 quarters	-0.006	-0.002	-0.029	0.011
	[-0.030 , 0.017]	[-0.024 , 0.016]	[-0.057 , 0.003]	[-0.015 , 0.030]
Time to treatment -2 quarters	-0.013	-0.002	-0.017	0.011
	[-0.035 , 0.013]	[-0.024 , 0.021]	[-0.036 , 0.007]	[-0.014 , 0.035]
Time to treatment -1 quarter	-	-	-	-
Time to treatment 0	0.012	0.020**	-0.016	0.030**
	[-0.008 , 0.032]	[0.005 , 0.036]	[-0.036 , 0.004]	[0.009 , 0.048]
Time to treatment +1 quarter	0.020	0.020	-0.038**	0.045***
	[0.000 , 0.040]	[-0.002 , 0.040]	[-0.066 , -0.009]	[0.019 , 0.067]
Time to treatment +2 quarters	0.016	0.025**	-0.056***	0.045***
	[-0.003 , 0.042]	[0.007 , 0.049]	[-0.077 , -0.030]	[0.019 , 0.071]
Time to treatment +3 quarters	0.018	0.022*	-0.052***	0.045***
	[0.002 , 0.034]	[0.002 , 0.039]	[-0.076 , -0.029]	[0.019 , 0.067]
Time to treatment +4 quarters	0.026***	0.024**	-0.041**	0.045***
	[0.009 , 0.042]	[0.008 , 0.039]	[-0.070 , -0.014]	[0.024 , 0.062]
Time to treatment +5 quarters	0.016	0.025***	-0.034	0.042***
	[0.002 , 0.032]	[0.009 , 0.040]	[-0.070 , 0.001]	[0.019 , 0.061]
Time to treatment +6 quarters	0.035***	0.028**	-0.046***	0.043***
	[0.024 , 0.046]	[0.011 , 0.045]	[-0.079 , -0.016]	[0.018 , 0.066]
Time to treatment +7 quarters	0.021**	0.020*	-0.034**	0.038***
	[0.006 , 0.039]	[0.003 , 0.039]	[-0.061 , -0.006]	[0.012 , 0.062]
Time to treatment +8 quarters	0.034**	0.032**	-0.038*	0.038***
	[0.010 , 0.056]	[0.007 , 0.053]	[-0.066 , -0.006]	[0.015 , 0.058]
Time to treatment +9 quarters	0.035***	0.025**	-0.033**	0.041***
	[0.018 , 0.053]	[0.004 , 0.045]	[-0.068 , -0.005]	[0.018 , 0.062]
Time to treatment +10 quarters	0.037**	0.031*	-0.017	0.046**
	[0.015 , 0.054]	[0.006 , 0.053]	[-0.044 , 0.012]	[0.015 , 0.074]

Note: Significance levels are indicated by ∗ < .1, ∗∗ < .05, ∗∗∗ < .01. Wildbootstrap confidence intervals are reported in brackets. Post-reform periods shown in the table are limited to those that allow robust comparison, i.e. those that include the only not-yet treated units as controls for the newly treated.

Table A4: Mothers' labour market outcomes: Callaway and Sant'Anna (2021) dynamic effects

	LF participation	Employment	Hours worked	Part-time (vs not working)
Time to treatment -23 quarters	-0.177***	0.002	0.089	0.032
	[-0.311,-0.042]	[-0.118 , 0.122]	[-0.198 , 0.376]	[-0.040 , 0.105]
Time to treatment -22 quarters	-0.088	-0.055***	-0.043	-0.052
	[-0.177 , 0.002]	[-0.104 , -0.006]	[-0.152 , 0.066]	[-0.109 , 0.005]
Time to treatment -21 quarters	-0.059	-0.053	-0.057	-0.02273
	[-0.167 , 0.048]	[-0.172 , 0.067]	[-0.309 , 0.194]	[-0.111 , 0.065]
Time to treatment -20 quarters	0.044	0.0282	0.071	0.056
	[-0.051 , 0.139]	[-0.106 , 0.162]	[-0.203 , 0.345]	[-0.047 , 0.159]
Time to treatment -19 quarters	0.031	0.049	-0.009	0.037
	[-0.122 , 0.184]	[-0.113 , 0.211]	[-0.104 , 0.086]	[-0.051 , 0.125]
Time to treatment -18 quarters	-0.034	0.008	0.010	0.045
	[-0.160 , 0.091]	[-0.143 , 0.158]	[-0.088 , 0.108]	[-0.052 , 0.143]
Time to treatment -17 quarters	-0.027	-0.034	-0.030	0.008
	[-0.125 , 0.071]	[-0.148 , 0.081]	[-0.161 , 0.100]	[-0.105 , 0.120]
Time to treatment -16 quarters	-0.015	-0.008	-0.025	0.000
	[-0.132 , 0.102]	[-0.125 , 0.108]	[-0.147 , 0.097]	[-0.054 , 0.054]
Time to treatment -15 quarters	-0.013	0.003	-0.038	0.020
	[-0.102 , 0.075]	[-0.106 , 0.112]	[-0.166 , 0.090]	[-0.040 , 0.080]
Time to treatment -14 quarters	-0.008	0.008	-0.034	0.035
	[-0.134 , 0.119]	[-0.101 , 0.118]	[-0.127 , 0.059]	[-0.021 , 0.091]
Time to treatment -13 quarters	-0.047	-0.031	0.019	-0.024
	[-0.182 , 0.089]	[-0.151 , 0.089]	[-0.101 , 0.139]	[-0.089 , 0.041]
Time to treatment -12 quarters	-0.010	-0.003	-0.014	0.017
	[-0.136 , 0.116]	[-0.126 , 0.119]	[-0.106 , 0.077]	[-0.057 , 0.090]
Time to treatment -11 quarters	-0.026	-0.034	-0.029	-0.012
	[-0.146 , 0.094]	[-0.161 , 0.094]	[-0.125 , 0.068]	[-0.081 , 0.056]
Time to treatment -10 quarters	-0.035	-0.031	-0.017	-0.019
	[-0.202 , 0.132]	[-0.179 , 0.118]	[-0.096 , 0.062]	[-0.132 , 0.094]
Time to treatment -9 quarters	-0.012	-0.023	-0.019	-0.001
	[-0.158 , 0.133]	[-0.189 , 0.142]	[-0.167 , 0.129]	[-0.084 , 0.082]
Time to treatment -8 quarters	-0.030	-0.030	0.0124	-0.017
	[-0.130 , 0.069]	[-0.108 , 0.048]	[-0.108 , 0.133]	[-0.063 , 0.029]
Time to treatment -7 quarters	-0.026	-0.020	-0.038	0.036
	[-0.105 , 0.052]	[-0.110 , 0.071]	[-0.186 , 0.110]	[-0.028 , 0.100]
Time to treatment -6 quarters	-0.040	-0.022	0.003	0.011
	[-0.146 , 0.065]	[-0.134 , 0.090]	[-0.116 , 0.123]	[-0.050 , 0.072]
Time to treatment -5 quarters	-0.047	-0.012	-0.081	0.027
	[-0.206 , 0.112]	[-0.112 , 0.088]	[-0.208 , 0.047]	[-0.022 , 0.077]
Time to treatment -4 quarters	-0.055	-0.057	-0.001	-0.065
	[-0.212 , 0.102]	[-0.239 , 0.124]	[-0.117 , 0.114]	[-0.188 , 0.058]
Time to treatment -3 quarters	-0.046	-0.039	-0.006	-0.026
	[-0.206 , 0.113]	[-0.187 , 0.110]	[-0.144 , 0.132]	[-0.124 , 0.072]
Time to treatment -2 quarters	-0.018	-0.016	0.011	-0.026
	[-0.103 , 0.067]	[-0.137 , 0.104]	[-0.086 , 0.107]	[-0.100 , 0.048]
Time to treatment -1 quarter	-	-	-	-
Time to treatment 0	-0.020	-0.020	0.001	-0.006
	[-0.150 , 0.109]	[-0.143 , 0.103]	[-0.076 , 0.078]	[-0.061 , 0.049]
Time to treatment +1 quarter	0.019	0.017	-0.016	0.040
	[-0.053 , 0.091]	[-0.084 , 0.117]	[-0.103 , 0.070]	[-0.018 , 0.099]
Time to treatment +2 quarters	0.021	0.013	-0.054	0.014
	[-0.072 , 0.113]	[-0.075 , 0.100]	[-0.130 , 0.021]	[-0.070 , 0.098]
Time to treatment +3 quarters	0.021	0.021	-0.010	0.025
	[-0.059 , 0.101]	[-0.073 , 0.115]	[-0.124 , 0.103]	[-0.078 , 0.128]
Time to treatment +4 quarters	0.057	0.023	-0.045	0.034
	[-0.032 , 0.146]	[-0.060 , 0.107]	[-0.194 , 0.105]	[-0.031 , 0.100]
Time to treatment +5 quarters	0.013	-0.007	-0.130	0.014
	[-0.111 , 0.136]	[-0.139 , 0.125]	[-0.392 , 0.132]	[-0.078 , 0.105]
Time to treatment +6 quarters	0.059	0.006	-0.155	-0.029
	[-0.012 , 0.131]	[-0.100 , 0.113]	[-0.431 , 0.120]	[-0.109 , 0.052]
Time to treatment +7 quarters	0.027	0.023	0.005	-0.04
	[-0.089 , 0.143]	[-0.153 , 0.198]	[-0.124 , 0.135]	[-0.132 , 0.055]
Time to treatment +8 quarters	0.103	0.0924	-0.294	0.14285
	[-0.027 , 0.232]	[-0.057 , 0.242]	[-0.760 , 0.172]	[-0.140 , 0.426]
Time to treatment +9 quarters	0.155***	0.135***	-0.067	0.123***
	[0.037 , 0.272]	[0.035 , 0.235]	[-0.164 , 0.031]	[0.006 , 0.239]
Time to treatment +10 quarters	0.275***	0.273	-0.169***	0.14787***
	[0.133 , 0.418]	[0.137 , 0.409]	[-0.281 , -0.057]	[0.002 , 0.294]

Note: Significance levels are indicated by ∗ < .1, ∗∗ < .05, ∗∗∗ < .01. Wildbootstrap confidence intervals are reported in brackets. Post-reform periods shown in the table are limited to those that allow robust comparison, i.e. those that include the only not-yet treated units as controls for the newly treated.

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