
LUND UNIVERSITY

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# The causal effect of paid parental leave on gender equality

A comparative analysis with a synthetic control method

**First year master thesis by**

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## Abstract

This study estimates the causal effect of paid parental leave on gender equality. California and New Jersey are the two first states in the United States to implement a statewide program offering six weeks of compensated parental leave, when having a new-born or adopted child. To estimate the effects of these reforms, I use repeated cross-sectional micro-level Census and ACS data from 2001 and 2015. For each state and outcome, I construct a synthetic control out of the remaining states, and compare it to the treated state in a Difference-in-Differences (DiD) approach. The study investigates the impact on share of hours worked and share of wage earned by the mother in the household, as well as on the labour market outcomes; labour force participation, wage level and average hours worked per week. I find a significant increase in share of hours worked in New Jersey and share of wage earned by the mother in California, which indicates a small positive effect on gender equality. A dynamic analysis validates the robustness of the findings for New Jersey. However, the dynamic analysis reveals that the increase in California is not solely driven by the intervention, as I identify a clear positive pre-trend prior to the intervention in labour force participation among mothers. Any conclusions regarding the general effects of paid parental leave on gender equality in California can hence not be drawn. Further, I find that the effect on gender equality in New Jersey is mostly driven by a change on the extensive margin: More married mothers, especially low-income mothers, participate in the labour force as a consequence of paid parental leave.

**Key words**: *Labour market, Paid parental leave, Gender equality, Synthetic control, Difference-in-Difference, Labour force participation*

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# 1 Introduction

The thesis evaluates the effects of paid parental leave programs on gender equality. To estimate the effects I use data on California and New Jersey, as they are the two first states in the United States to introduce parental leave with compensation. I analyse the effects of the paid parental leave by using repeated cross-sectional micro-level Census and ACS data from 2001 and 2015 and applying a Difference-in-Differences (DiD) approach. I identify the effects by comparing the outcomes of each treated state with a weighted combination of other states, called a synthetic control. In order to estimate the impact on gender equality, I examine the effect on the share of wage earned by the mother in a household as well as the share of hours worked in the labour market. To explain the economic mechanisms behind the change in gender equality, I also evaluate the effect on the outcome variables; being in or out the labour force, log wage as well as average hours worked per week, looking individually on fathers and mothers.

Similar studies estimate the effects of paid parental leave in California. Baum et al. evaluated the impact on paid parental leave by using NLSY-97 cohort data. By using this detailed data, including working history of mothers and fathers prior and after the child was born, they examine the effects of the duration on the leave for mothers and fathers separately as well as the impact on wages and the average hours of work. They find that the duration of the leave increases for mothers as well as that fathers increase their leave slightly. Additionally, they identify effects in terms of better employment possibilities after birth for mothers and an increase of average hours worked during a child second year of life (Baum et al., 2016).

In order to estimate the effect of paid parental leave, I use a difference-in-difference method, which compares the outcome of the treated subject with a control group that has not been affected by the intervention. A common issue is to find a valid control group that has a similar trend with the treated subject before the reform. I approach this problem by creating synthetic controls and I can hence estimate the effects in a more precise way, with stronger credibility. I do also perform a dynamic analysis, by looking at the effect of the intervention for respective year relative to the implementation of paid parental leave program. Thus I can make sure whether the effects solely are caused by the investigated intervention.

My study contributes to the existing literature in five ways. First by focusing on the effect on gender equality rather than the duration of the leave. Second, by estimating the effect on a second state, New Jersey, the validity of the results can be confirmed. Third, I use synthetic controls in order to attain similar trends between the control and the treated state prior to the intervention. Four, this study contributes with the important aspect of identifying possible pre-trends occurring prior the intervention. Fifth, I analyse the heterogeneities in order to examination whether the impact differs across groups with different education and income level.

Based on the economic theories of New home economics, The separate sphere model, Taste based- and statistical discrimination, I expect that the reform will increase gender equality between mothers and fathers. These theories suggest a positive effect on gender equality, as mother's comparative advantage and relative bargaining power increases when the compensation for parental leave is present. The discrimination towards women in terms of wages and when hiring is also likely to decrease when fathers also get eligible to take part of the leave. While the results from a simple DiD method suggest that the intervention had a positive impact on share of wage for California, a more detailed dynamic analysis reveals that these spurious results are due to an increase in labour force participation among mothers already prior the reform. The same analysis confirms the robustness of the New Jersey results that paid parental leave increases share of hours worked by mothers. An increase in labour force participation among mothers is driving the change in gender equality.

The study shows that the impact on gender equality differs across groups with different education- and income level. It is important to check for heterogeneities, as the reform is likely to affect groups in society differently. As the alterative cost of leaving the labour force and to stay at home with a child already was high for high-income and high-educated individual prior to the reform, it is reasonable to expect that the compensation of parental leave impacts low-income individuals to a larger extent. The results show inconsistent results when testing heterogeneities on share of hours worked and share of wage. One likely explanation to the opposing results is the economic situation. New Jersey had a time of recession after the intervention and California had a time of flourishing economy. I find consistent results between the two states indicating that especially low-income mothers increased their labour force participation after the intervention. Although, it is important to

keep in mind that I identify a clear positive pre-trend in terms of labour force participation among all mothers in California and the results can hence not guarantee that the effect among low-income mothers in California is solely driven by the intervention.

## 2 Paid parental leave in California and New Jersey

One out of five mothers in 2006-2008 quit their job when having a child in the United States (U.S. Census Bureau, 2011). The United States differs from most industrialized countries when it comes to providing paid parental leave to parents (Baum et al., 2016). Each state offers up to 12 weeks of unpaid leave and some are aiming to implement partially paid parental leave, but the benefits are still considerable less generous than in most European countries (OECD, 2016). Today traditional gender structures still remain, where women often takes the role of the caregiver and men the role of the breadwinner. Farré (2016) shows that the design of the parental leave policy not only impacts gender equality in terms of wages, labour force participation, but also the division between household work and labour market work. Her literature review finds that an increase in maternity leave increases labour force participation among women but decrease wages and that reserved leave for fathers induce women's career possibilities (Farré, 2016).

Prior to 1993 there were no federal requirements to offer employees parental leave when having a child in the United States. In 1993 the Family Medical Leave Act (FMLA) enabled women to use twelve weeks of unpaid parental leave. Before the legislated maternity leave was introduced, the employer had no requirements to offer job-protected leave for mothers. Instead mothers commonly had to leave the labour force in order to take care of the newly born (Baum, 2003). However, the FMLA did not guarantee all mothers job-protection. Only employees working at a firm with more than 50 workers, living within a distance of maximum of 75 miles from work and who had worked for at least 1,250 hours the last year, were eligible for the program (Ruhm, 1997).

Baum (2003) analyses the effects of the introduction of the FMLA. The results show that mothers were more likely to return to work after the reform was implemented, but did not increase the probability of taking a leave (Baum, 2003). The FMLA was later partly extended trough the temporary disability insurance in California, Rhode Island, New Jersey, Hawaii and New York. This extension enabled pregnant mothers with health related issues to take a short time off work, commonly prior to birth for approximately 6 weeks, covering up to two thirds of the salary (Rossin-Slater et al., 2012).

California was the first state in United States to enact a paid family leave program (PFL). The program that was implemented in July 1, 2004, aims to facilitate family care giving and enable parents to take time off work when having a child while being compensated with approximately 55 % of lost salary (State of California Employment Development Department, 2016a). The paid family program compensates parents for an income loss up to six weeks during their child's first year (State of California Employment Development Department, 2016b). A similar program was implemented in New Jersey July 1, 2009, that provides parents the benefit of bonding with their new-born or adopted child up to six weeks during its first year. This benefit compensates up to two thirds of the employee's wage (State of New Jersey, 2016). A third state, Rhode Island, introduced paid parental leave on January 1, 2014, and offers up to four weeks of paid leave (NSCL, 2013). With slightly different coverage, California, New Jersey and Rhode Island, are the first three states in the United States to implement paid parental leave. In contrast to previous parental leave reforms, the PLF targets both mothers and fathers. However, the leave only offers job-protection, if the employee fulfils all requirements necessary to be covered by the FMLA. In that case the parent is guaranteed their pre-birth job after the leave (Rossin-Slater et al., 2012). Both Baum et al. (2016) and Rossin – Slater et al. (2012) find an effect of the introduction of the PFL in California. They show that the duration of the leave for both fathers and mothers increases, when the PFL is introduced, and that the average hours worked by mothers increase after the child birth. Rossin-Slater (2012) also identifies that less advantage groups are more affected than others.

## 3 Theoretical implications

I base my theoretical implications on theories explaining the mechanisms in the labour market in a context of gender equality. First, I include theories that not only explain the division of work in the household and in the labour market but also why women get discriminated in the labour market to a larger extent than men. Second, I include a theory explaining how different levels of alternative costs may impact labour market outcomes differently depending on individuals' income- and education level. Third and finally, as my study investigates the effect of interventions that were implemented at times with different economic situations, I do also base my theoretical predictions on a theory explaining the relationship between business fluctuations and labour force participation. I base my theoretical implications on the following theories; *New home economics*, *The separate sphere model*, *Taste based discrimination*, *The statistical discrimination model*, *The theory of alternative cost* and *The added worker effect.*

According to Becker's theory of *New home economics* a family wants to maximize utility as one unit. The time-allocation between work in the household and work in the labour market is therefore determined by price (Stanfors, 2007). The family allocates the time in order to maximize the utility for the family as a whole. This is done accordingly to the specialization theory, the spouse allocate its time where the parent has the highest comparative advantage. As men historically have had higher wages, they more commonly allocate their time in the labour market, whereas the women specialize on household-work (Becker, 1991). Based on Becker's theory, I expect an increase in share of hours worked and share of wage earned by mothers, when the financial compensation for leave becomes available. I expect the increase, due to a change on the extensive margin. More mothers will participate and stay in the labour force. In line with the specialization theory, the comparative advantage for women to work in the labour market increases.

In contrast to Becker's model, the *Separate sphere model* describes how the decision-making process in a household is based on individual's preferences rather than a family as a whole. The time-allocation between hours of labour work and household work among the household members is determined by the relative bargaining power between the two parties. Individuals with higher income will hence have a stronger bargaining position relative to low-income individuals. The traditional gender roles in a family will therefore be enhanced, since the individual with lower income, typically the woman, has less power to impact decisions. Since

women generally take a greater share of the unpaid household work, this worsens possibilities for women to participate in the labour market to the same extent as men (Lundberg & Pollak, 1993). When the paid parental leave is introduced, I predict an increase in the relative bargaining power for mothers. This will in turn increase labour force participation for mothers, as there are fewer incentives for the low-income spouse to permanently leave the labour force when having a child as well as that the bargaining power for the low-income spouse increases. Since the leave no longer is accessible to only mothers, the relative bargaining power for fathers to stay at home to take care of the child increases. Thus, I expect that the time allocation spent at home will change. I predict that the share of hours worked in the labour market and the share of wage for the low-income spouse will increase when the reform takes place, due to a change on the intensive margin. Meaning that wage and hours worked by a mother already in the labour force is expected to increase simultaneously as the hours worked by the father decreases.

In addition to theories explaining the division of hours worked at home and in the labour market, between the spouses, different forms of discrimination impact women's' and men's positions in the labour market. Becker explains the theory of *Taste-based discrimination* in the book Economics of Discrimination. He describes why people are discriminated against on the bases of skin colour, religion, class and personality. Becker states that discrimination of a specific group is a result of some individuals having the preferences to discriminate a certain group to a larger extent than others (Becker, 1957). In more recent research from Arrow and Phelps, *The theory of statistical discrimination* has been introduced. This theory explains discrimination as an effect of limited information. Decisions are based on certain group averages instead of the individual's abilities. In some cases a group's average abilities can be based on preconceptions (Phelps, 1972; Arrow, 1971). In line with the theory of taste based - and statistical discrimination females face a higher risk of being discriminated in hiring processes, wage settings and promotions, due to the fact that they are expected to take time off work when having a child. Albrecht et al. (1998) also find a negative relationship between length of leave and wage. However, he highlights the fact that it is probably not due to human capital depreciation. Instead he suggests that it is due to signalling, employers expect women to take time of and hence find women's dedication to work to be lower. This is later reflected in the salary trend and the incentives for the employer to support women's career decreases, which partly explains the wage gap between genders (Albrecht et al., 1998). I predict that the discrimination towards women will decrease, since the introduction of paid parental leave will

give mothers greater incentives to return to work as well as it induces better linkage with their pre-birth work. Instead the option of paid parental leave should increase employer's incentives to have greater trust in career possibilities for women. Therefore, I expect that women's wage relative to their spouses will increase.

Wieser's micro economic *theory of alternative cost* is referring to a cost of an alternative option of how the money can be used. The cost is hence the lost revenue form the option that you do not choose to use (Streissler, 2008). Referring to the alternative cost theory, higher educated individuals with higher income have a higher alternative cost of staying at home with their child or leaving the labour force compared to lower educated individuals with lower wages. Therefore, I assume that higher educated individuals already participate in the labour force prior to the reform to a larger extent than lower educated individuals, due to the high alternative cost of staying at home. I would hence expect to see the largest effect of an increase in share of hours worked and share of wage among low-income and lower educated individuals. I expect that the increase is driven by a higher labour force participation among low-income and lower educated mothers that prior to the reform typically left the labour force when having a child. This since the alternative cost of staying at home get even higher when the financial compensation is present.

Finally, I expect the degree of the effect caused by the implementation of PFL to be related to the general economic situation. The time after the PFL was implemented in California, between 2004 and 2008, there was a boom in the economy. After the introduction in New Jersey (2009), there was a financial crisis. According to the theory of *Added worker effect* married women tends to work more in times of economic crises. This is due to the high unemployment rate among men and that the labour supply among women increases, since women that earlier have been out of the labour force start to look for jobs in order to maintain the income level in the family or part-time working mothers start to work full-time. When unemployed fathers stay at home, this enable mothers to increase their time in the labour market (Mincer, 1962; Bredtmann et al., 2014). Therefore, I predict that the increase in labour force participation among women in New Jersey will be higher than in Califronia, as the program was implemented at a time of financial crises. I expect that this in turn will generate a higher increase in share in hours worked and share of wage in New Jersey compared to Califronia.

To conclude, the economic theories of New home economics, The separate sphere model, Taste based- and statistical discrimination suggest that the reform will increase gender equality between mothers and fathers. First, I expect a positive effect on gender equality, as mother's relative bargaining power and comparative advantage increases when the paid parental leave program is present. Second, the discrimination towards women in hiring process and wage settings is also likely to decrease when fathers also get eligible to take part of the leave. Therefore, I expect a positive effect on gender equality. Third, based on the alternative cost theory, I predict to find the largest increase in share of hours worked and share of wage among low-income individuals. Fourth and last, the theory of added worker effect suggest that the I will find a larger increase in labour force participation among mothers in New Jersey compared to California, due to the different economic situation at the times the programs were implemented.

## 4 Data and Identification strategy

I use repeated cross-sectional micro-level Census and ACS data from 2001 and 2015 (IPUMS, 2015). The set contains data on individuals in the United States (except for Rhode Island). I do not include Rhode Island in the analysis as the state introduced paid parental leave within the sample period in 2014. Neither can I measure the effect of paid parental leave in Rhode Island, due to few observable years after the paid parental leave was introduced in 2014. A panel data set is not public available due to confidentiality. However, due to the generous amount of observations (3,002, 836 including all states), I believe that the repeated cross sectional data will be representative for the population for respective state for all observed years. I focus on married mothers and fathers who had children between 1998-2015. Since the focus of the paper is gender equality in households, I exclude same sex marriages in order to estimate the relative changes between men and women.[1]

The data includes not only information on the spouse responding to the survey but also information on the respondent's spouse. I include five variables in the study: share of hours worked in the labour market, share of wage earned by the mother, being in or out of the labour force, wage level and average hours worked per week. I calculate the variable share of wage by adding the two spouses' wages and thereafter I divide the female spouse wage by the total family wage. I calculate the variable share of hours worked in the labour market in the same way.

$$Share\ of\ wage = \frac{Wage\ of\ female\ spouse}{Wage\ of\ female\ spouse + Wage\ of\ male\ spouse}$$

$$Share\ of\ hours\ worked = \frac{Hours\ worked\ by\ female\ spouse}{Hours\ worked\ by\ female\ spouse + Hours\ worked\ by\ male\ spouse}$$

The three remaining variables are tested for each gender. The variable in labour force is coded as one if the person is participating in the labour force and as zero otherwise. The second variable is wage. In the analysis, I use the inflation adjusted logged wage, with 2010 as the base year. The third variable is average hours worked, which contains information on the average hours worked per week.

[1] As same sex marriages as well as single parents are excluded form the analysis, I am well aware that the results cannot be generalised for the whole society.

In figures (1-4), I present descriptives over the distribution of share of hours worked and the share of wage. The graphs show the fraction of the total observations with the specified interval on the x-axis, of share of hours worked as well as share of wage for each state. The graphs include all years between 2001-2015. Figure 1 and 2 show that a large share of the families have a female spouse that works very few hours in the labour market, 0%-10% of the total hours worked in the family. This is true for both states, although the fraction is slightly higher in California. However, the general distribution appears similar in both states.

Figure 1

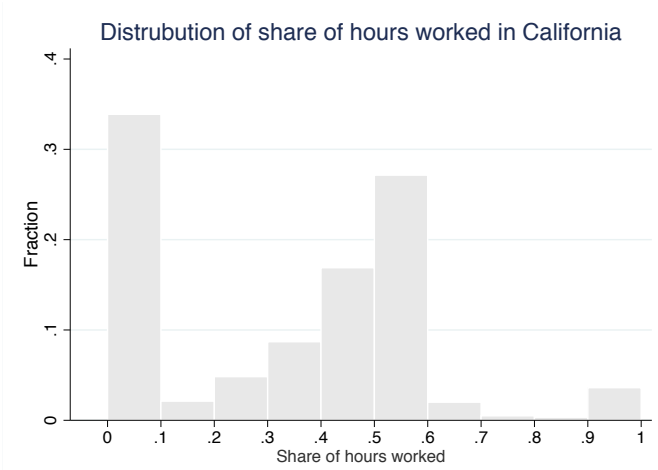



Figure 2

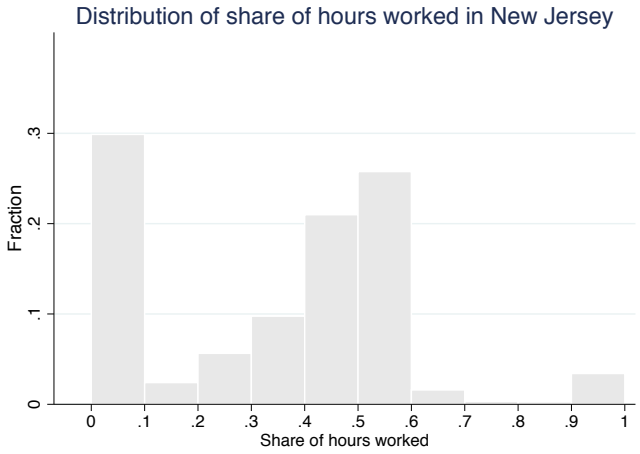



Figure 3

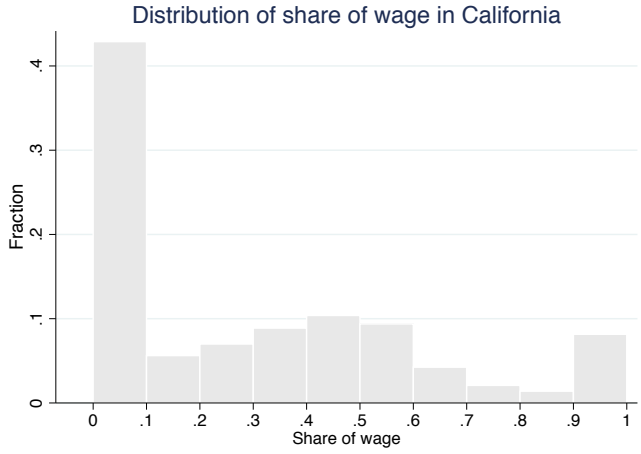



Figure 4

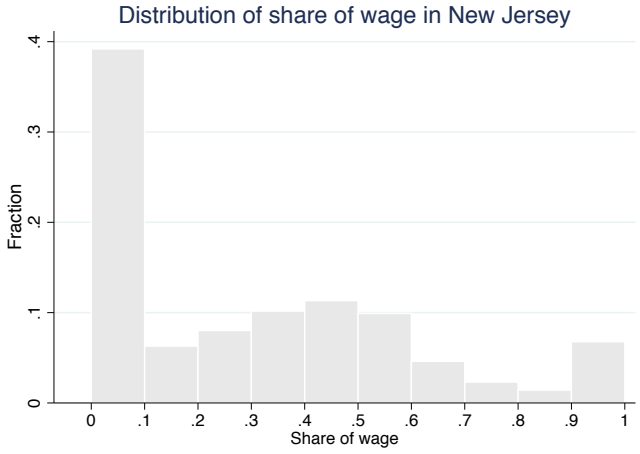



Figure 3 and 4 show the distribution of share of wage earned by the female spouse in the family. The distribution is similar between the two states. The fraction of mothers earning nothing to 10 % of the total family wage is however slightly higher in California.

## 4.1 Difference-in-Difference method

I estimate the effects of paid parental leave programs on gender equality between married couples by using a Difference-in-Difference (DiD) approach. By comparing the outcome of the treated state with control states where the treatment did not happen, I can distinguish the impact of the so-called treatment, which in this case is the introduction of paid family leave. The DiD method assumes common trends, implying that absent a treatment, the treated state and the control states would have trended similarly. However, when choosing a control as the neighbouring state or another state with similar characteristics this assumption is not very realistic, since the trends prior the intervention is likely to vary. In order to approach this problem I will use the method of synthetic controls (Abadie & Gardeazabal, 2003). The method will be further explained in section 4.2. In the following section I explain the basic structure of a difference-in-difference design.

$$y_{isb} = \alpha + \delta_s + \mu_t + \partial_b + \beta_1 \text{Post}_{ib} + \beta_2 \text{Treated}_{is} + \beta_3 (\text{Treated} * \text{Post})_{isb} + \beta_4 \underline{\overline{X}}_{isb} + \varepsilon_{isb} \quad (1)$$

First, I create the model, by generating a dummy (Treated), equal to one if it is the treated state (California, New Jersey) and equal to zero if it is a control state. This is done in order to control for the specific characteristics that are always true for the treated state and that are not related to the intervention. Secondly, in order control for effects that also occur in the control state, I generate a dummy (Post), equal to one if the child is born post the treatment and equal to zero if children are born before the treatment. By interacting the treatment and the post dummy, I acquire the coefficient of interest ($\beta_3$), representing the impact of the paid parental leave program in the treated state. I also include state fixed effects ($\delta_s$), year fixed effects ($\mu_t$) and year of birth fixed effects ($\partial_b$). Further, I include additional controls to control for age, race, education level and family characteristics ($\underline{\overline{X}}_{ist}$). The identification (i) is indicating the individual, (s) the state, (b) the year of birth of the oldest child and (t) the census year. I perform the regressions on the following outcome variables ($y_{isb}$); Share of hours worked and share of wage earned by the mother in the family as well as an dummy variable for participating in the labour force or not, log wage (inflation adjusted) and average hours worked per week for mothers respectively fathers[2]

[2] DiD studies with default standard errors underestimate the standard error. This issue can be approached by clustering standard errors by state-level, implying correlation with-in the clusters but independent between clusters (Bertrand et al., 2004). The problem with my study is that I only have one treated state and clusters are too few in general, then clustering standard errors are not suitable (Cameron et al., 2008). I am therefore using default standard errors in all regressions.

It is important to note that the time variable is the year of birth of the child (b) and not the census year (t). This means that an observation that is coded as year of birth = 1999, have different census years. However, when running the regression, year fixed effects and year of birth fixed effects are included, which corrects for potential biases caused by the different observation years (e.g. due to business cycle fluctuations). The variable *year of birth* is indicating the year of birth for the oldest child, since previous literature (Dechant & Blossfeld, 2015; Schober, 2013; Gjerdingen & Center, 2005) find that the first-born child has the greatest impact on parents' division of paid and unpaid work.

## 4.2 Synthetic control

In order to match the controls with the treated state's pre-trend, prior the intervention, I construct a synthetic control (Abadie & Gardeazabal, 2003). I attain an ideal control state by weighting a combination of states from the entire sample of states that match the pre-trend of the treated state. This is done by matching predictors from the entire sample of states with the treated state's pre-trend. Each regression has a unique combination of weighted states (Alberto et al. 2010). I exclude Rhode Island from the sample of potential control states and I drop California when I create synthetic controls for New Jersey and I drop New Jersey when I create the synthetic control for California, as they are treated at some point in the sample.

Table 1

| Predictors | California | Synthetic control | Avarage of all states |
|---|---|---|---|
| Education level | 7.635758 | 7.782119 | 8.123406 |
| Age of parent at birth of child | 29.86115 | 28.906 | 29.316 |
| Share of wage (1999) | 0.2909724 | 0.290976 | 0.3137253 |
| Share of wage (2000) | 0.2822402 | 0.282482 | 0.3103915 |
| Share of wage (2001) | 0.2825782 | 0.2825755 | 0.3079499 |
| Share of wage (2002) | 0.2822501 | 0.282179 | 0.3068988 |
| Share of wage (2003) | 0.2866129 | 0.2865981 | 0.305 |

I present one example of the matched predictors in table 1. This is the matched predictor for the outcome variable share of wage for California. The weighted synthetic control predictors are better than the average of all states. This enables the control and the treated state to have

Table 2

| State | Unit weight |
|---|---|
| Delaware | 0.27 |
| Florida | 0.036 |
| Arizona | 0.002 |
| Nevada | 0.227 |
| Utah | 0.065 |
| Wyoming | 0.11 |
| Washington | 0.29 |
| Total | 1 |

similar pre-trends and I can hence identify the effect of the treatment. I perform the same procedure for every outcome variable for respectively state. Table 2 provides an example of the unique weights for the synthetic controls for California with the outcome variable share of wage.

Figure 5

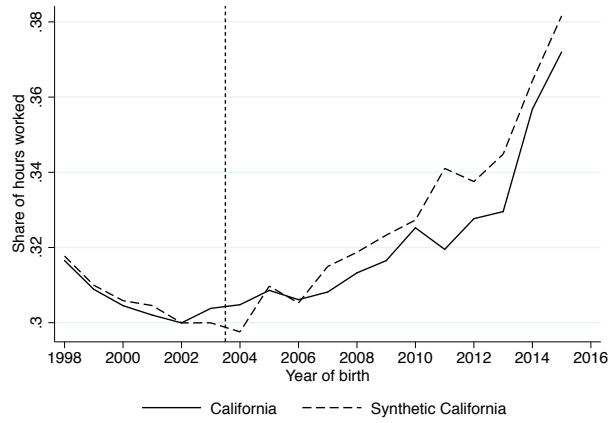



Figure 6

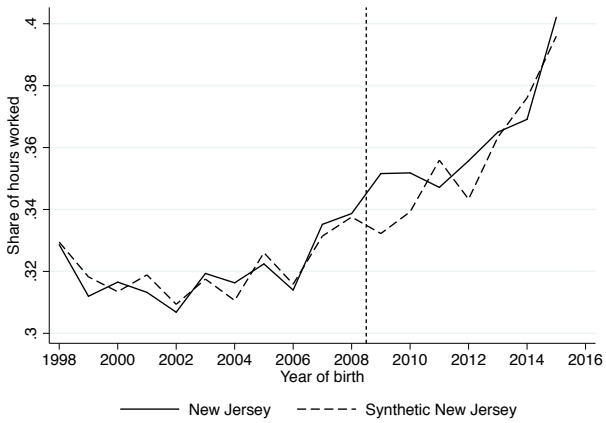



Figure 7

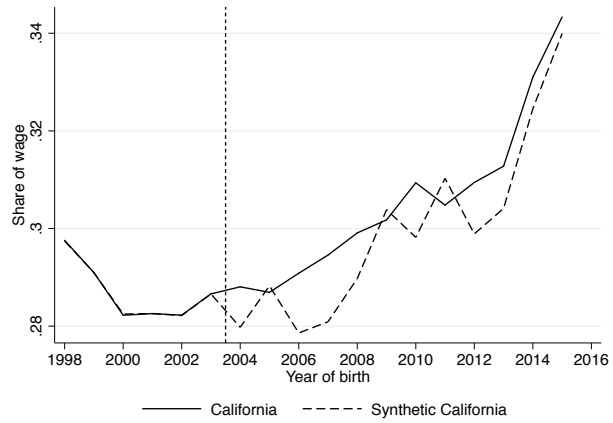
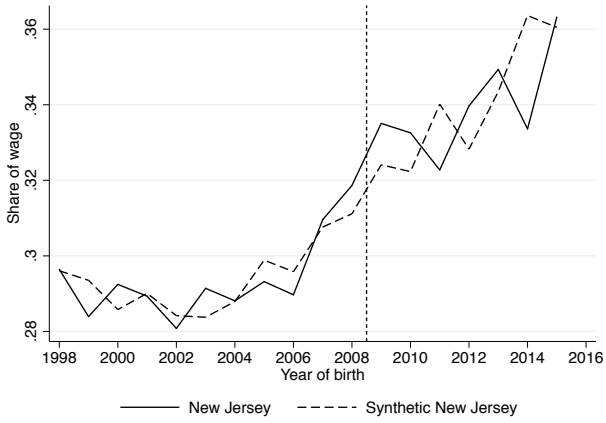



Figure 8




Figures (5-8) illustrate the effect of the paid parental leave program by plotting the treated state's trend together with the synthetic control for the main variable of interest; share of hours worked and share of wage. The implementation of the reform is marked with the dotted vertical line. Additional graphs are found in appendix (F).

## 5 Sensitivity analysis

In order to validate the results, I perform a sensitivity analysis by including different models. Table 3 presents results from four specifications, arranged by columns. The first column includes all observations of married fathers and mothers. The second column (model 2) excludes observations where the year of birth of the oldest child is equal to the year of the reform[3], as I do not have access to data on month of birth of the child.[4] This is done to guarantee that no observations that are coded as post intervention, in reality has a child born prior the intervention. The third column excludes observations where the youngest child is born after the year of the reform and where the oldest child is born prior the year of the reform. This is performed to ensure that no individuals that are in the sample had the oldest child prior the reform and younger child after the reform. Finally, in the fourth column I exclude a combination of observation excluded in model (2) and model (3)[5], in order to guarantee that results do not contain any measurement errors.

In addition to the four different models, I look at the dynamic effects related to the introduction of the PFL. By performing a dynamic regression, I provide an additional validation of the results. The dynamic regression is testing the effect of the paid parental leave program for respective year relative to the implementation. I include one year-dummy for each year relative to the reform. Year (0) is the year of the reform, year (-3) includes individuals that had a child three years prior to the reform and year (5) is including individuals having children five years after the implementation and so on. By performing a dynamic analysis, I can identify if there are any positive or negative trends of the outcome variables prior to the reform. In a case where I identify a pre-trend, I cannot guarantee that the identified effect is purely due to the implementation of the paid parental leave.

In addition, one more robustness check is performed. I perform three placebo tests by changing the treated state to a new random state and changing the year of the treatment to a random year. This is done in order to validate the results and make sure that I do not find any similar results.

[3]Model 2 excludes $(Year\ of\ birth\ of\ olders\ child = Year\ of\ reform)$

[4] The year of birth is calculated with the following formula: $(Year\ of\ birth = Cesnus\ year - Age\ of\ oldest\ child)$, which implies that a child coded as year of birth = 2004 actually could be born in 2003.

[5]Model 4 excludes observations if ( $Year\ of\ birth\ of\ oldest\ child = Year\ of\ reform$) and if ($Year\ of\ birth\ of\ youngest\ child \geq Year\ of\ refrom$ & $Year\ of\ birth\ of\ oldest\ child < Year\ of\ refrom$)

# 6 Results

In this section, I present the results on the main variable of interest; *share of hours worked* and *share of wage* earned by the mother in a family. Table 3 contains all models (1)-(4)[6] for New Jersey and California. These variables represent the change in gender equality as an effect of the paid parental leave program. I proceed in five steps. First, table 4 presents the outcome variables, *in labour force*, *log wage* and *average hours worked* per week, which explain the economic mechanisms behind the change in gender equality in the household for each gender, respectively. The results in table 4 only include regressions from model (4). Second, I provide the results on the dynamic effects in order to validate the results. Third, I present the heterogeneous effects in terms of income and education level in table 5. Fourth, I provide robustness checks and finally I summarize the main findings.

## 6.1 Main results

Table 3 presents the main results, measuring the effect on gender equality of the paid parental leave program for New Jersey and California. The results vary depending on model, which verifies the suspicion regarding the preciseness of the observations. For instance, the outcome variable share of hours worked is changing sign. Therefore, I find models (1 -3) to be biased and misleading, as the models appear to include observations that are wrongly coded on respective threshold of the intervention. I will hence consider model (4) to be the most reliable model, as it is obvious that measurement errors are found in the less restricted models. The choice of model (4) is also supported by the fact that the impact on share of wage in California gets larger, the more restricted the model gets.

The results indicate that paid parental leave effects gender equality. I find an increase in share of wage earned by the mother in a household in California, a significant positive effect of 0.793 percentage points. Also, share of hours worked by the mother in in New Jersey increases as a result of the intervention, although only significant on a 10 % level. However, the results are not consistent between the states and I can therefore not generalize the effect of

[6] Model 1 includes the original sample
Model 2 excludes observations if year of birth =year of reform
Model 3 excludes observations if birth_youngest>=year of reform & birth_oldest<year of reform
Model 4 is a combination of Model 2 & 3

the program. Possible reasons why the degree of the impact varies between the states will further be discussed.

Table 3: The effect of paid parental leave on gender equality

| | Model 1 | Model 2 | Model 3 | **Model 4** |
|---|---|---|---|---|
| | Original regression | Dropped if year of birth =year of reform | Dropped if birth_youngest>= year of reform & birth_oldest<year of reform | **Combination of Model 2 & 3** |
| | | | California | |
| **Share of hours worked** | -0.00360*** | -0.00529*** | 0.00272* | **0.00108** |
| | (0.00136) | (0.00143) | (0.00162) | **(0.00167)** |
| | [0.3038003] | [0.3038003] | [0.3038003] | **[0.3038003]** |
| *R-squared* | 0.043 | 0.043 | 0.038 | **0.037** |
| **Share of wage** | 0.00396** | 0.00432** | 0.00752*** | **0.00793*** ** |
| | (0.00179) | (0.00188) | (0.00214) | **(0.00222)** |
| | [0.2866129] | [0.2866129] | [0.2866129] | **[0.2866129]** |
| *R-squared* | 0.032 | 0.032 | 0.028 | **0.028** |
| Number in treated state | 314577 | 314576 | 255714 | **229972** |
| | | | New Jersey | |
| **Share of hours worked** | 0.00518* | 0.00286 | 0.00824*** | **0.00601*** |
| | (0.00290) | (0.00329) | (0.00294) | **(0.00332)** |
| | [0.3193486] | [0.3193486] | [0.3193486] | **[0.3193486]** |
| *R-squared* | 0.048 | 0.048 | 0.047 | **0.048** |
| **Share of wage** | 0.00503 | 0.00303 | 0.00809** | **0.00619** |
| | (0.00367) | (0.00415) | (0.00372) | **(0.00420)** |
| | [0.2914315] | [0.2914315] | [0.2914315] | **[0.2914315]** |
| *R-squared* | 0.039 | 0.040 | 0.040 | **0.040** |
| Number in treated state | 96313 | 92529 | 83631 | **79847** |

Notes: All regression are controlled for state, year and year of birth fixed effect. Family specific, age and race controls are also included in all regressions. Additional controls for the spouse and a gender dummy is included. All regressions include synthetic controls. As regressions have a different number of synthetic control states with individual combination of weights, the number of observations varies. The total number of individuals in the treated state is presented in the row "Number in treated state". Robust standard errors are presented in parentheses and means of the outomce variables for individuals having children on year before the treatment is presented in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 4: The economic mechanism behind the change in gender equality

| | Female | | Male | |
|---|---|---|---|---|
| | California | New Jersey | California | New Jersey |
| **In labour force** | 0.0401*** | 0.0212** | 0.00548*** | -0.00609* |
| | (0.00695) | (0.00873) | (0.00151) | (0.00322) |
| | [0.6102681] | [0.7008511] | [0.9472879] | [0.9645904] |
| *R-squared* | 0.061 | 0.061 | 0.012 | 0.011 |
| Number in treated state | 115245 | 39992 | 114727 | 39855 |
| **Log wage** | -0.0244 | -0.00789 | -0.00582 | -0.0302* |
| | (0.0169) | (0.0235) | (0.00714) | (0.0158) |
| | [10.29697] | [10.56815] | [10.87143] | [11.08827] |
| *R-squared* | 0.195 | 0.143 | 0.285 | 0.239 |
| Number in treated state | 76142 | 27654 | 109721 | 38363 |
| **Average hours worked** | -0.304** | -0.344 | -0.378** | -0.140 |
| | (0.141) | (0.259) | (0.187) | (0.183) |
| | [34.27963] | [35.60777] | [43.34665] | [44.4759] |
| *R-squared* | 0.027 | 0.036 | 0.035 | 0.033 |
| Number in treated state | 76142 | 27654 | 109721 | 38363 |

Notes: The effect on the outcome variable in labour force is showing the effect on the extensive margin, being out or participating in the labour force. The outcome variables log wage and average hours worked are showing the effect on the intensive margin, the effect of the intervention on individuals already participating in the labour force. Observations are dropped if year of birth =year of reform & if birth_youngest>=year of reform & if birth_oldest<year of reform. All regression are controlled for state, year and year of birth fixed effect. Family specific, age and race controls are also included in all regressions. All regressions include synthetic controls. As the regressions have a different number of synthetic control states with individual weights, the number of observations varies .The total number of individuals in the treated state is presented in the row "Number in treated state". Robust standard errors are presented in parentheses and means of the outomce variables for individuals having children on year before the treatment is presented in brackets. *** p<0.01, ** p<0.05, * p<0.1

The results in table 4 demonstrate the effect of the economic mechanisms driving the change in gender equality in the household. In other words the change in share of hours worked and share of wage. The effect on the outcome variable *in labour force* is presenting the effect on the extensive margin, being out or participating in the labour force. The results of the outcome variables *log wage* and *average hours worked* show the effect on the intensive margin, the effect of the intervention on individuals already participating in the labour force.

I test the following implications; first if it is true that the relative bargaining power and the comparative advantage for mother's increases when the intervention takes place. Table 4 shows that this is true. The major force behind the increase in share of wage earned by mothers in California is due to a change on the extensive margin, that more mothers stay or participate in the labour force as an effect of the intervention. The labour force participation rate among married mothers increases by four percentage points as a result of the program. Although it appears that fathers increase their labour force participation rate, I still find it to be a minor effect. New Jersey show consistent results with California in terms of the increase of labour force participation among married mothers, an increase of two percentage points. Second, I test whether the implication of an added worker effect in times of financial crises is true. Table 4 show a negative effect on the labour force participation rate among fathers in New Jersey, which is in line with expectations of higher unemployment rate among males due to the financial crisis. In contrast, I note that the effect on labour force participation among mothers in New Jersey is slightly lower than in California, which is contradicting the theory of the added worker effect, that the labour force participation will increase more among mothers in times of financial crises. However, as the financial crises occurred in all states, this should be captured by the year fixed effects.

Furthermore, the intervention appears to have no effect on wages. However, it occurs that both married mothers and fathers in California, already participating in the labour force prior to the reform, decrease the average hours work per week as an effect of the intervention. As the reduction of average hours worked by fathers is more obvious than for mothers this could partly explain the significant increase in share of wage earned by mothers in California. Also this is in line with the theoretical predication that the relative bargaining power for fathers to stay at home and take care of the child increases for males, as that option of leave gets available. For New Jersey I find that the increase in labour force participation among mothers on the extensive margin is the major explanation driving the increase in share of hours worked by married mothers.

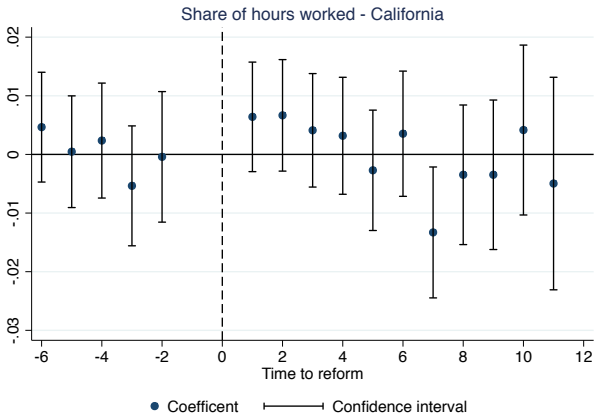
In the Appendix (A & B) I present the results for all models (1-4). In order to validate the findings, I analyse the dynamic effects of the paid parental leave program in the next section.

## 6.2 The dynamic results

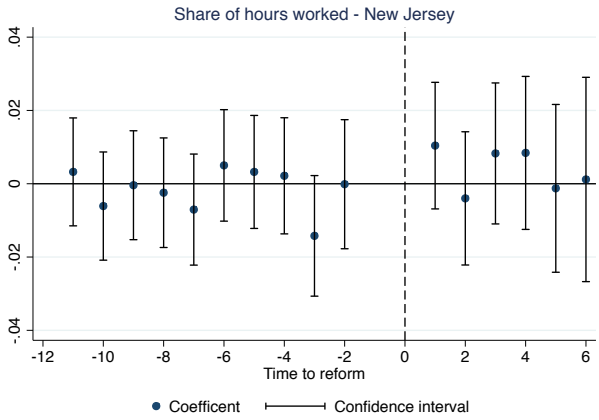
The dynamic results in graphs 1-4 show the coefficient, and the confidence interval, respectively, for every year of birth relative to the treatment for the main variable of interest; share of hours worked and share of wage. The dotted line is the implementation of the reform. The coefficient is showing the effect relative to one year prior to the treatment, the base year is (-1). The results are very noisy with high confidence intervals, as there are very few observations for each given year. In order to attain significant results this requires aggregation.

The dynamic effects of the paid parental leave program

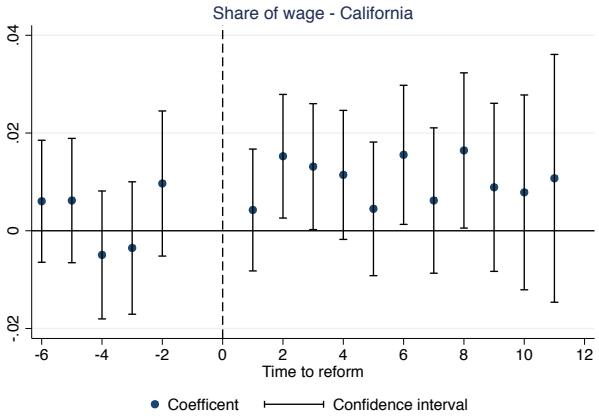
Graph 1



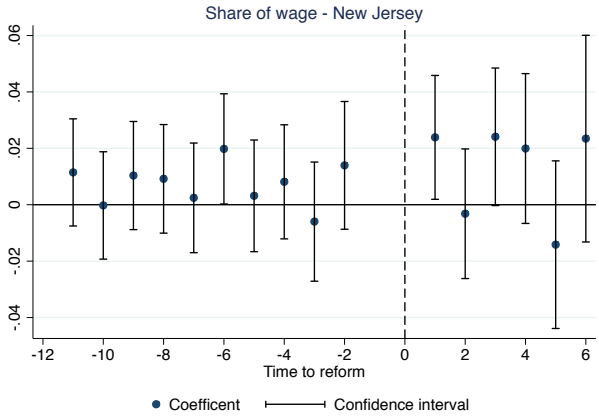

Graph 2




Graph 3




Graph 4

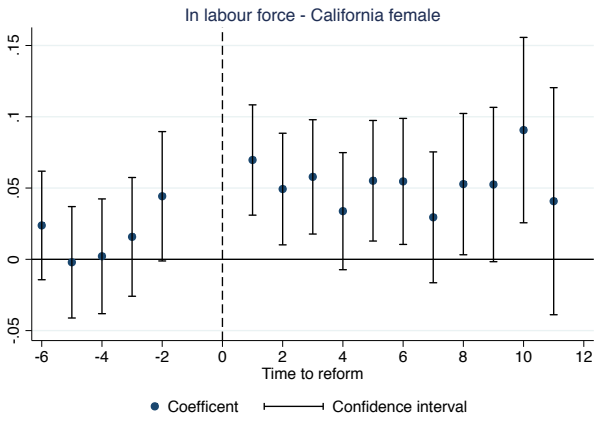



The dynamic graph for share of hours worked in California indicates a negative trend prior to the reform. However, after the reform I note a slightly higher level of share of hours worked and thereafter the share of hours worked decreases. This is in line with the insignificant

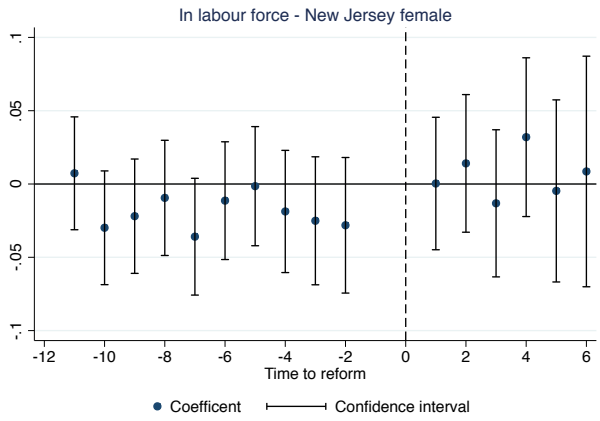
results in table 3. The share of hours worked in New Jersey appears fairly constant prior to the intervention. I note a slightly higher share of hours worked after the reform and this is hence validating the accuracy of the significant increase in share of hours worked in New Jersey. Continuing with the effect on share of wage, the dynamic graphs show fairly constant pre-trends for both New Jersey and California. Although, I find a slightly positive pre-trend in California three years prior to the reform. Thus, conclusions should be drawn with caution regarding the effect on share of wage in California. The increase it is less clear for New Jersey, which is in line the insignificant result in table 3. In order to validate the significant results I find in table 4, I present the dynamic effects on labour force participation, as I find it to explain the most part of the effect on gender equality within the households. The dynamic graphs for the rest of the outcome variables are found in Appendix (C).

The dynamic effects on labour force participation

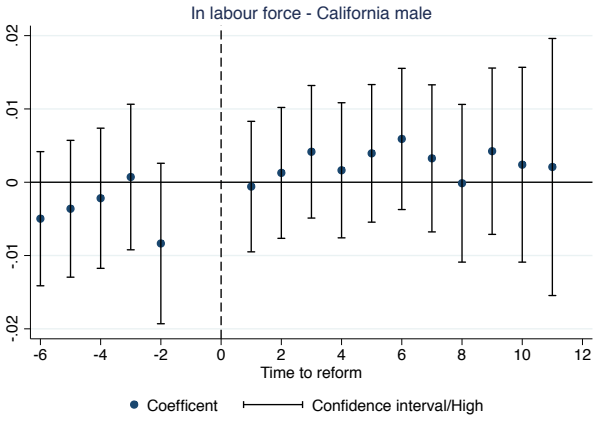
Graph 5



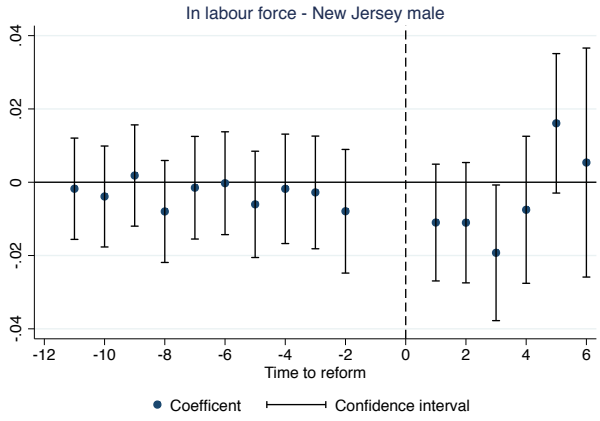

Graph 6




Graph 7




Graph 8



I identify a positive pre-trend in labour force participation among mothers in California before the intervention. This indicates that the increase in labour force participation among mothers is likely not driven solely by the implementation of the paid parental leave program. The increase in labour force participation among mothers in California seems to stabilize two years before the reform and effect at the time of the implementation is unclear. I find a somewhat clearer effect of the intervention among mothers in New Jersey, although it is fairly vague. The results indicate an even less clear effect for fathers in New Jersey and I identify a positive pre-trend for fathers in California prior to the implementation of the reform.

## 6.3 Heterogeneities

In order to evaluate whether there are any different effects depending on sub-group in society, I estimate the regressions in table 5. Table 5 shows the heterogeneous effects related to education- and income- level. In line with the theoretical predictions based on the alternative cost theory, I find that mostly low-educated and low-income individuals are affected by the reform in New Jersey. The effect on share of hours worked and share of wage in New Jersey appears to be driven by a change among individuals with lower education. The same affect applies for low-income individuals in New Jersey that increase the share of wage earned by the mother as a result of the intervention. However, in contrast to New Jersey the results indicate that it is high-income individuals in California that drive the increase in share of wage. What is likely to cause the different effects between the states will further be discussed. The heterogeneous results on all outcome variables are found in Appendix (D & E) where I find more consistent effects regarding labour force participation among mothers. The results are in line with the findings of Rossin-Slater (2012), that less advantage mothers is more affected by the intervention. Low-income mothers increase their labour force participation to a larger extent than high-income mothers in both California and New Jersey.

Table 5: Heterogeneous results (1), Education and Income Level

| | Share of hours worked | | Share of wage | |
|---|---|---|---|---|
| | California | New Jersey | California | New Jersey |
| | | Education level | | |
| Baseline | -0.00131 | 0.0254*** | 0.000518 | 0.0334*** |
| | (0.00321) | (0.00844) | (0.00392) | (0.0106) |
| Higher education | 0.00368 | -0.0252*** | 0.00937** | -0.0347*** |
| | (0.00376) | (0.00917) | (0.00475) | (0.0115) |
| *R-squared* | 0.039 | 0.048 | 0.029 | 0.040 |
| Number in treated state | 229972 | 79847 | 229972 | 79847 |
| | | Income level | | |
| Baseline | 0.00418 | 0.0104 | 0.000452 | 0.0207** |
| | (0.00281) | (0.00661) | (0.00360) | (0.00838) |
| Higher income | -0.00168 | -0.00694 | 0.0127*** | -0.0227** |
| | (0.00340) | (0.00743) | (0.00446) | (0.00946) |
| *R-squared* | 0.063 | 0.087 | 0.038 | 0.061 |
| Number in treated state | 229972 | 79847 | 229972 | 79847 |

Notes: Observations are dropped if year of birth =year of reform & if birth_youngest>=year of reform & if birth_oldest<year of reform. The dummy variable Higher education is indicating the difference in the effect of paid parental leave for individuals with education on college level, compared to individuals with lower education (baseline) .The dummy variable Higher income is indicating the difference in the effect of paid parental leave for individuals with high income, compared to individuals with low income (baseline). All regression are controlled for state, year and year of birth fixed effect. Family specific, age and race controls are also included in all regressions. Controls for the spouse and a gender dummy is included for the regressions. All regressions include synthetic controls. As regressions have a different number of synthetic control states with individual weights, the number of observations varies. The total number of individuals in the treated state is presented in the row "Number in treated state". Robust standard errors are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

## 6.4 Placebo test

In order to check for the robustness of the results, I perform a placebo test. This is done by choosing a random state and applying random year of the intervention in a DiD design with synthetic controls. By performing three placebo tests I can validate my results and make sure that estimated effects are not random. The point is to make sure that I do not find any random significant effects in the placebo states. In table 6, I do not identify any significant effects in the placebo states; Delaware, Florida and Nevada. This therefore supports and validates the findings and the choice of identification strategy.

Table 6: Placebo tests

| | Delaware | Florida | Nevada |
|---|---|---|---|
| **Share of hours worked** | 0.00661 | 0.00192 | 0.000634 |
| | (0.00644) | (0.00258) | (0.00425) |
| | [0.368794] | [0.3669905] | [0.3073081] |
| *R-squared* | 0.054 | 0.036 | 0.048 |
| **Share of wage** | 0.000454 | 0.000824 | 0.00750 |
| | (0.00810) | (0.00317) | (0.00527) |
| | [0.3574728] | [0.3443822] | [0.2891815] |
| *R-squared* | 0.038 | 0.030 | 0.045 |
| Number in treated state | 6166 | 104873 | 15955 |
| Selected treatment year | 2003 | 2004 | 2006 |

Notes: The selected year and placebo state is randomlly chosen. All regression are controlled for state, year and year of birth fixed effect. Family specific, age and race controls are also included in all regressions. Additional controls for the spouse and a gender dummy is included. All regressions include synthetic controls. As regressions have a different number of synthetic control states with individual combination of weights, the number of observations varies. The total number of individuals in the treated state is presented in the row "Number in treated state". Robust standard errors are presented in parentheses and means of the outomce variables for individuals having children on year before the treatment is presented in brackets. *** p<0.01, ** p<0.05, * p<0.1

## 7 Discussion and conclusion

This paper estimates the causal effect of paid parental leave on gender equality. I show that the intervention affects gender equality by an increase in share of hours worked in the labour market by mothers in New Jersey. The results from a simple DiD show an increase in share of wage earned by mothers in California, while a more detailed dynamic analysis reveals that the increase is not solely driven by the intervention. The findings demonstrate the importance of validating the results in two ways. First, by testing the results in more than one state, I find that the effects of paid parental leave are not generic and the outcome is different depending on a state's characteristics and economic situation. Second, by testing the dynamic effects, I identify a positive trend prior to the intervention in labour force participation among mothers in California, which confirms that the effect on share of wage in California is not only caused by the paid parental leave program. I can thereby conclude that the paid parental leave program affects gender equality in New Jersey but any general conclusions regarding the effect on gender equality in California cannot be drawn.

The results for both New Jersey and California show consistent results of an effect on the extensive margin, that especially low-income mothers increase their labour force participation. Fewer mothers leave the labour force when having a child. The dynamic analysis confirms the robustness of the results in New Jersey. I can therefore conclude that the effect on gender equality in New Jersey is mainly driven by an increase on the extensive margin. However, I can not draw the same conclusions for California, as the more detailed dynamic analysis reveals that the impact on share of wage is due to an increase in labour force participation among mothers already prior to the intervention takes place. I find no increase in share of hours worked by mothers in California and no increase in share of wage earned by mothers in New Jersey.

The fact that the effect on gender equality is not reconfirmed and consistent in both states can have a number of explanations. First, the characteristics vary between the states. Second, the programs were implemented at different times. The finding of a significant increase in share of wages in California but not in New Jersey is likely to be related to that in a time of a flourishing economy it is easer to raise wages, in contrast to in times of economic recessions. However, as I find consistent results in terms of labour force participation, it is possible that being out or in the labour force is not as sensitive to the current economic situation, since one

individual in the labour force still can be unemployed. The possibilities of increasing wages and offering more working hours on the other hand is probably more restrained by the current economic situation. Third, the different designs of the programs are likely to be of importance. The benefit in New Jersey compensates up to two third of the employees wage, which is slightly higher than the 55% in California. As the benefit is more generous in New Jersey this could be one reason why I find the program to affect gender equality in New Jersey.

Further, being the first or the second state to implement a reform is likely to be of importance. In New Jersey the results indicate that mostly lower educated and low-income individuals have been affected by the reform. In contrast to California where I find that high-educated individuals are more affected. One possible explanation is that in California, being the first state to implement the program, people were less aware of the existence of the program. An evaluation regarding the awareness of the paid parental leave programs show that the awareness regarding the existence of the program and the benefits in both states are relative low and that especially less advantage groups, with lower income and education level, are less aware (Tisinger et al., 2016). As New Jersey was the second state, the knowledge regarding the benefits might have been more widely spread, which can explain the effect that lower educated and low-income individuals are more affected by the reform in New Jersey. The findings in New Jersey are hence more in line with my expectations that the increase in the alternative cost of staying at home would affect low-income individuals more.

An additional reason why highly educated individuals are more affected by the reform in California can be related to the recent trend that more and more tech companies in USA have introduced their own parental leave benefits, many of them located in California (Alsever, 2013). Assuming that it is mostly high-educated and high-income individuals working at such companies offering more flexible and generous parental leave benefits, this could explain why high-income individuals appear to drive the change in gender equality in California. However, this has not been tested and needs to be further investigated.

The findings are also in line with the theoretical predictions regarding a decrease in discrimination of mothers as a result of the intervention. The findings suggest that mothers' wages relative to the fathers' wages in a household increase as well as the time-allocation between household work and labour market work. This is likely related to a change in

expectation that women leave the labour force when having a child. As the results suggest that the expectations that only mothers will take the leave have changed, this is also likely related to the fact that also males have access to the leave. The intervention seems hence to have increased employer's incentives of having greater trust in career possibilities for women.

Even if some of the findings are not consistent in both states, the results indicate that the intervention has some positive effect on gender equality. Although I cannot confirm that the impact on gender equality in California is solely driven by the intervention, I find a robust positive effect on gender equality in New Jersey. I also find consistent results in terms of an increase in labour force participation among low-income mothers. Further expansion in terms of compensated parental leave should hence be considered, especially if policy-makers want to promote gender equality among low-income mothers. Even if the cost of the program is relative large and affects a relative small group, additional positive externalities, in terms of having more low-income mothers in the labour force, can bring positive benefits to society. An additional note to consider is that even if the duration of paid parental leave is relative short, the norms and attitudes concerning traditional gender structures is likely to to get affected when the subject gets attention. A combination of more equal and generous leaving arrangements and by paying the subject more attention, is likely to improve, especially low-income women's status in the labour market.

However, I find it important to consider the specific characteristics of the state, as the effects appear to vary depending on economic situation and target group. I interpret the results as in times of financial crises policy-makers cannot expect to see a large effect of the change in relative income share between the genders, as the possibilities for employers to offer higher salaries are restrained. When considering the effects in both times of busts and booms, the results indicate that policy-makers should consider to expand the possibilities of offering the same parental leaving agreements for both mothers and fathers in order to attain more equal pay and division between household work and labour market work among parents. A potential draw back with the current design of the program is the different requirements that the applier has to fulfil in order to get the compensation. This imply that some groups in society get worse of, in terms weaker attachments to the labour market. An additional note worth to consider is the importance of spreading information across all socioeconomic groups in society.

Overall, the study finds that the paid parental leave program generates a positive effect on gender equality in New Jersey. The effect is mostly driven by a change on the extensive margin, especially more low-income mothers stay in the labour force after having a child. The study also highlights the importance of validating the results. As I identify a positive trend in labour force participation among mothers prior to the intervention in California, I cannot draw any firm conclusions regarding the effect of the reform in California.

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# Appendix

## A. Sensitivity analysis Female

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| | Original regression | Dropped if year of birth =year of reform | Dropped if birth_youngest>= year of reform & birth_oldest<year of reform | Combination of Model 2 & 3 (Table 2) |
| | | | California | |
| **In labour force** | 0.0214*** | 0.0248*** | 0.0363*** | 0.0401*** |
| | (0.00559) | (0.00588) | (0.00671) | (0.00695) |
| | [0.6102681] | [0.6102681] | [0.6102681] | [0.6102681] |
| *R-squared* | 0.067 | 0.067 | 0.062 | 0.061 |
| Number in treated state | 170464 | 157577 | 128132 | 115245 |
| **Log wage** | -0.0195 | -0.0207 | -0.0229 | -0.0244 |
| | (0.0143) | (0.0149) | (0.0164) | (0.0169) |
| | [10.29697] | [10.29697] | [10.29697] | [10.29697] |
| *R-squared* | 0.196 | 0.197 | 0.194 | 0.195 |
| Number in treated state | 109238 | 101078 | 84302 | 76142 |
| **Average hours worked** | -0.533*** | -0.611*** | -0.229* | -0.304** |
| | (0.119) | (0.125) | (0.137) | (0.141) |
| | [34.27963] | [34.27963] | [34.27963] | [34.27963] |
| *R-squared* | 0.025 | 0.026 | 0.026 | 0.027 |
| Number in treated state | 109238 | 101078 | 84302 | 76142 |
| | | | New Jersey | |
| **In labour force** | 0.0153** | 0.0150* | 0.0213*** | 0.0212** |
| | (0.00759) | (0.00863) | (0.00770) | (0.00873) |
| | [0.7008511] | [0.7008511] | [0.7008511] | [0.7008511] |
| *R-squared* | 0.065 | 0.065 | 0.061 | 0.061 |
| Number in treated state | 48222 | 46328 | 41886 | 39992 |
| **Log wage** | -0.00528 | -0.0127 | -0.000338 | -0.00789 |
| | (0.0204) | (0.0232) | (0.0208) | (0.0235) |
| | [10.56815] | [10.56815] | [10.56815] | [10.56815] |
| *R-squared* | 0.150 | 0.147 | 0.147 | 0.143 |
| Number in treated state | 33094 | 31740 | 29008 | 27654 |
| **Average hours worked** | -0.104 | -0.327 | -0.120 | -0.344 |
| | (0.225) | (0.256) | (0.228) | (0.259) |
| | [35.60777] | [35.60777] | [35.60777] | [35.60777] |
| *R-squared* | 0.038 | 0.038 | 0.036 | 0.036 |
| Number in treated state | 33094 | 31740 | 29008 | 27654 |

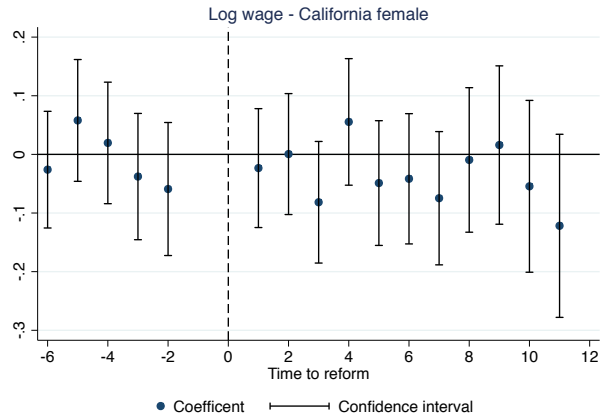
Notes: The effect on the outcome variable in labour force is showing the effect on the extensive margin, being out or participating in the labour force. The outcome variables log wage and average hours worked are showing the effect on the intensive margin, the effect of the intervention on individuals already participating in the labour force. All regression are controlled for state, year and year of birth fixed effect. Family specific, age and race controls are also included in all regressions. All regressions include synthetic controls. As the regressions have a different number of synthetic control states with individual weights, the number of observations varies .The total number of individuals in the treated state is presented in the row "Number in treated state". Robust standard errors are presented in parentheses and means of the outomce variables for individuals having children on year before the treatment is presented in brackets. *** p<0.01, ** p<0.05, * p<0.1

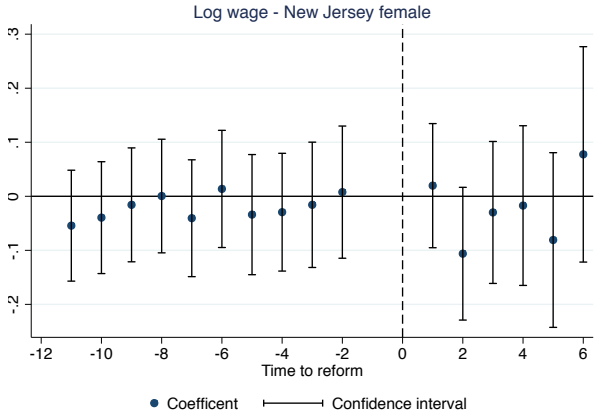
B. Sensitivity analysis Male

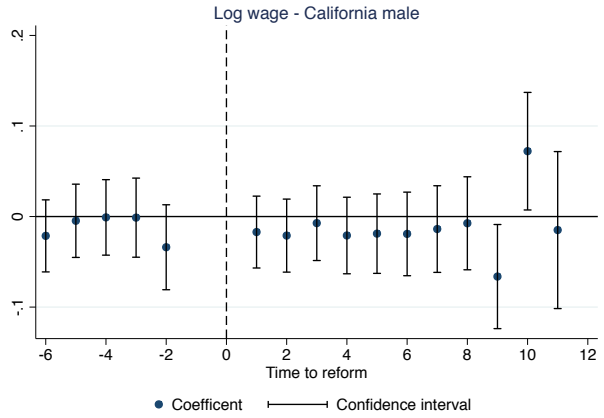
| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| | Original regression | Dropped if year of birth =year of reform | Dropped if birth_youngest>= year of reform & birth_oldest<year of reform | Combination of Model 2 & 3 (Table 2) |
| | | | California | |
| **In labour force** | 0.00370*** | 0.00410*** | 0.00507*** | 0.00548*** |
| | (0.00117) | (0.00122) | (0.00147) | (0.00151) |
| | [0.9472879] | [0.9472879] | [0.9472879] | [0.9472879] |
| *R-squared* | 0.010 | 0.011 | 0.011 | 0.012 |
| Number in treated state | 169854 | 156999 | 127582 | 114727 |
| **Log wage** | 0.00438 | 0.00277 | -0.00406 | -0.00582 |
| | (0.00583) | (0.00611) | (0.00689) | (0.00714) |
| | [10.87143] | [10.87143] | [10.87143] | [10.87143] |
| *R-squared* | 0.295 | 0.294 | 0.287 | 0.285 |
| Number in treated state | 162650 | 150307 | 122064 | 109721 |
| **Average hours worked** | -0.256* | -0.386** | -0.250 | -0.378** |
| | (0.154) | (0.164) | (0.178) | (0.187) |
| | [43.34665] | [43.34665] | [43.34665] | [43.34665] |
| *R-squared* | 0.037 | 0.037 | 0.035 | 0.035 |
| Number in treated state | 162650 | 150307 | 122064 | 109721 |
| | | | New Jersey | |
| **In labour force** | -0.00698** | -0.00596* | -0.00712** | -0.00609* |
| | (0.00280) | (0.00317) | (0.00285) | (0.00322) |
| | [0.9645904] | [0.9645904] | [0.9645904] | [0.9645904] |
| *R-squared* | 0.010 | 0.010 | 0.011 | 0.011 |
| Number in treated state | 48091 | 46201 | 41745 | 39855 |
| **Log wage** | -0.0275** | -0.0233 | -0.0347** | -0.0302* |
| | (0.0137) | (0.0157) | (0.0139) | (0.0158) |
| | [11.08827] | [11.08827] | [11.08827] | [11.08827] |
| *R-squared* | 0.243 | 0.242 | 0.240 | 0.239 |
| Number in treated state | 46343 | 44522 | 40184 | 38363 |
| **Average hours worked** | -0.269* | -0.134 | -0.274* | -0.140 |
| | (0.159) | (0.181) | (0.161) | (0.183) |
| | [44.4759] | [44.4759] | [44.4759] | [44.4759] |
| *R-squared* | 0.033 | 0.033 | 0.033 | 0.033 |
| Number in treated state | 46343 | 44522 | 40184 | 38363 |

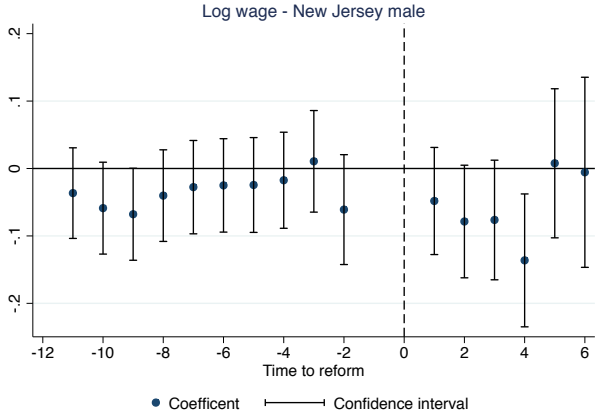
Notes: The effect on the outcome variable in labour force is showing the effect on the extensive margin, being out or participating in the labour force. The outcome variables log wage and average hours worked are showing the effect on the intensive margin, the effect of the intervention on individuals already participating in the labour force. All regression are controlled for state, year and year of birth fixed effect. Family specific, age and race controls are also included in all regressions. All regressions include synthetic controls. As the regressions have a different number of synthetic control states with individual weights, the number of observations varies .The total number of individuals in the treated state is presented in the row "Number in treated state". Robust standard errors are presented in parentheses and means of the outomce variables for individuals having children on year before the treatment is presented in brackets. *** p<0.01, ** p<0.05, * p<0.1

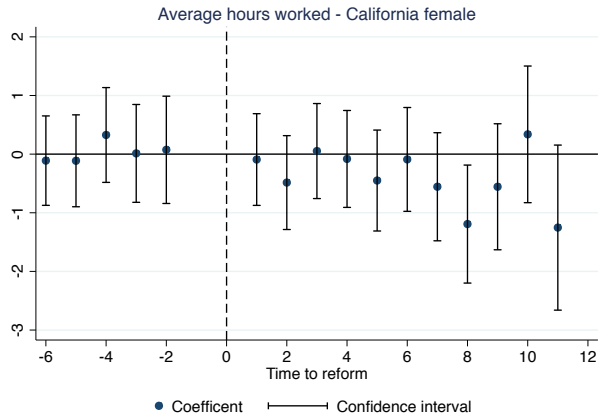
## C. Dynamic analysis: Log wage and average hours worked

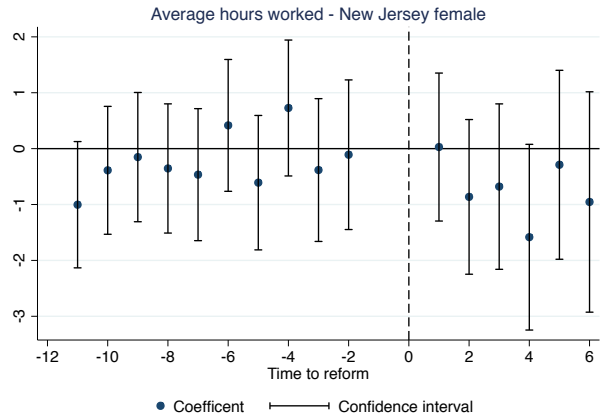


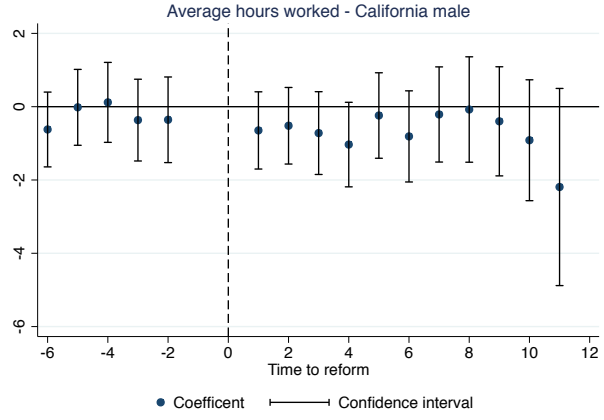



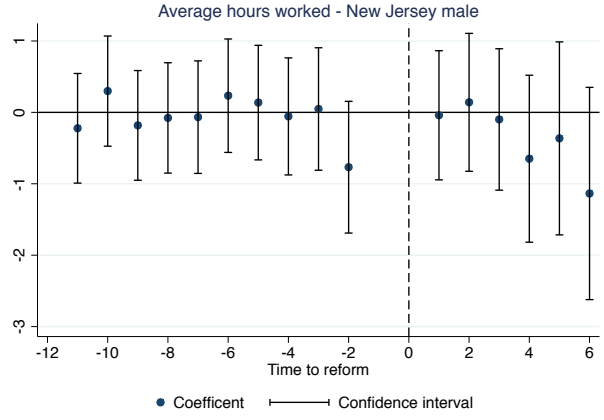



## D. Heterogeneous Results (2), Education Level

| | Female | | Male | |
|---|---|---|---|---|
| | California | New Jersey | California | New Jersey |
| **In labour force** | | | | |
| Baseline | -0.0164 | 0.0311 | 0.00535* | -0.00337 |
| | (0.0125) | (0.0245) | (0.00290) | (0.00816) |
| Higher education | 0.0832*** | -0.0142 | 0.00115 | -0.00297 |
| | (0.0149) | (0.0262) | (0.00336) | (0.00884) |
| *R-squared* | 0.063 | 0.061 | 0.012 | 0.011 |
| Number in treated state | 115245 | 39992 | 114727 | 39855 |
| **Log wage** | | | | |
| Baseline | -0.0546 | -0.00687 | -0.0197 | -0.0856** |
| | (0.0379) | (0.0729) | (0.0125) | (0.0361) |
| Higher education | 0.0344 | -0.000552 | 0.0167 | 0.0686* |
| | (0.0424) | (0.0770) | (0.0152) | (0.0402) |
| *R-squared* | 0.196 | 0.143 | 0.286 | 0.239 |
| Number in treated state | 76142 | 27654 | 109721 | 38363 |
| **Average hours worked** | | | | |
| Baseline | -0.499* | -0.479 | -0.198 | 0.398 |
| | (0.303) | (0.747) | (0.306) | (0.419) |
| Higher education | 0.274 | 0.0836 | -0.345 | -0.680 |
| | (0.343) | (0.797) | (0.387) | (0.466) |
| *R-squared* | 0.027 | 0.037 | 0.035 | 0.034 |
| Number in treated state | 76142 | 27654 | 109721 | 38363 |

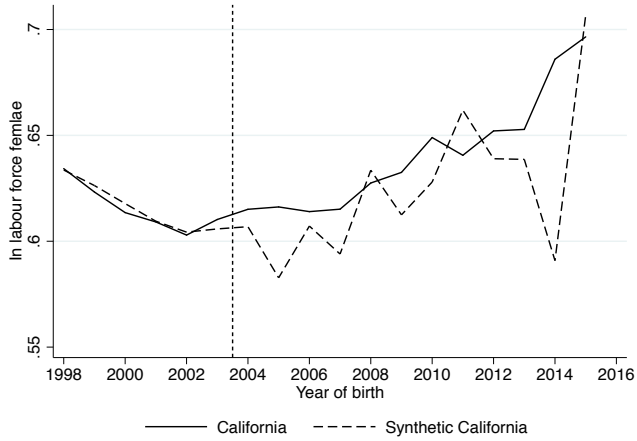
*Notes*: Observations are dropped if year of birth =year of reform & if birth_youngest>=year of reform & if birth_oldest<year of reform. The dummy variable *Higher education* is indicating the difference in the effect of paid parental leave for individuals with education on college level, compared to individuals with lower education (baseline). All regression are controlled for state, year and year of birth fixed effect. Family specific, age and race controls are also included in all regressions. Additional controls for the spouse and a gender dummy is included for the regressions share of hours worked and share of wage. All regressions include synthetic controls. As regressions have a different number of synthetic control states with individual weights, the number of observations varies. The total number of individuals in the treated state is presented in the row "Number in treated state". Robust standard errors are presented in parentheses and means of the outomce variables for individuals having children on year before the treatment is presented in brackets. *** p<0.01, ** p<0.05, * p<0.1

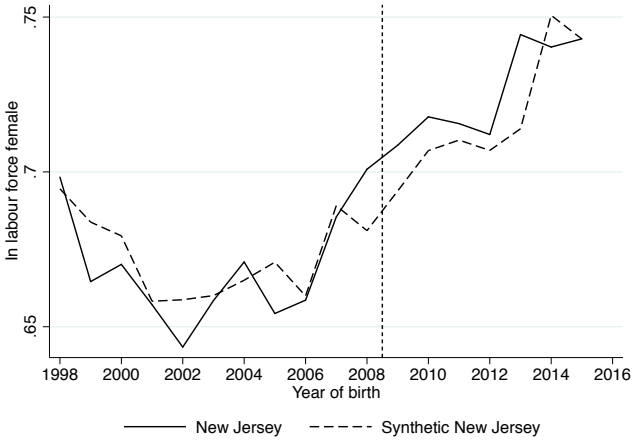
## E. Heterogeneous Results (3), Income Level

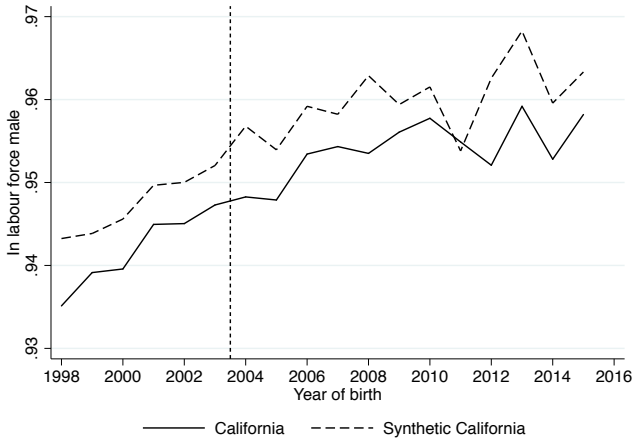
| | Female | | Male | |
|---|---|---|---|---|
| | California | New Jersey | California | New Jersey |
| **In labour force** | | | | |
| Baseline | 0.0224** | 0.0329** | 0.00259 | -0.0212 |
| | (0.00873) | (0.0137) | (0.00423) | (0.0132) |
| High income | -0.0205** | -0.0242* | 0.00350 | 0.0218 |
| | (0.00976) | (0.0145) | (0.00433) | (0.0133) |
| *R-squared* | 0.269 | 0.288 | 0.070 | 0.093 |
| Number in treated state | 115245 | 39992 | 114727 | 39855 |
| **Log wage** | | | | |
| Baseline | -0.0124 | -0.0152 | -0.00930 | -0.0586 |
| | (0.0254) | (0.0451) | (0.0149) | (0.0440) |
| High income | 0.0196 | 0.0169 | 0.00487 | 0.0546 |
| | (0.0270) | (0.0471) | (0.0159) | (0.0456) |
| *R-squared* | 0.591 | 0.600 | 0.592 | 0.540 |
| Number in treated state | 76142 | 27654 | 109721 | 38363 |
| **Average hours worked** | | | | |
| Baseline | -0.0418 | -0.268 | 0.154 | 1.087* |
| | (0.221) | (0.499) | (0.408) | (0.567) |
| High income | -0.123 | -0.0575 | -0.918** | -1.546*** |
| | (0.256) | (0.542) | (0.449) | (0.593) |
| *R-squared* | 0.235 | 0.280 | 0.104 | 0.089 |
| Number in treated state | 76142 | 27654 | 109721 | 38363 |

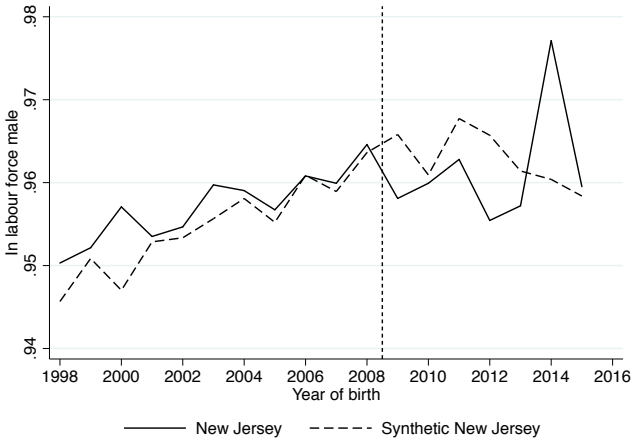
*Notes*: Observations are dropped if year of birth =year of reform & if birth_youngest>=year of reform & if birth_oldest<year of reform. The dummy variable Higher income is indicating the difference in the effect of paid parental leave for individuals with high income, compared to individuals with low income (baseline). All regression are controlled for state, year and year of birth fixed effect. Family specific, age and race controls are also included in all regressions. Additional controls for the spouse and a gender dummy is included for the regressions share of hours worked and share of wage. All regressions include synthetic controls. As regressions have a different number of synthetic control states with individual weights, the number of observations varies. The total number of individuals in the treated state is presented in the row "Number in treated state". Robust standard errors are presented in parentheses and means of the outomce variables for individuals having children on year before the treatment is presented in brackets. *** p<0.01, ** p<0.05, * p<0.1

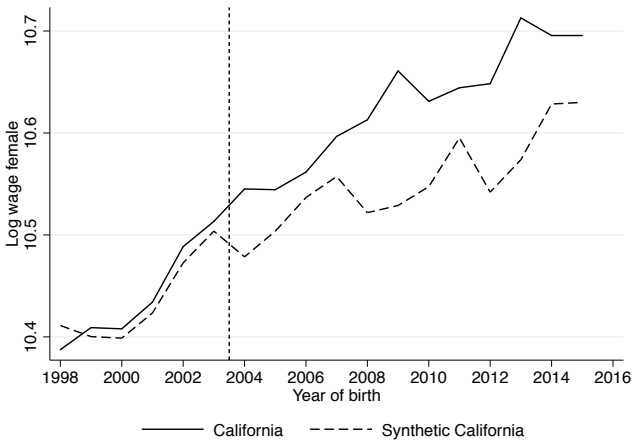
# F. Graphs of the treated state and the synthetic control

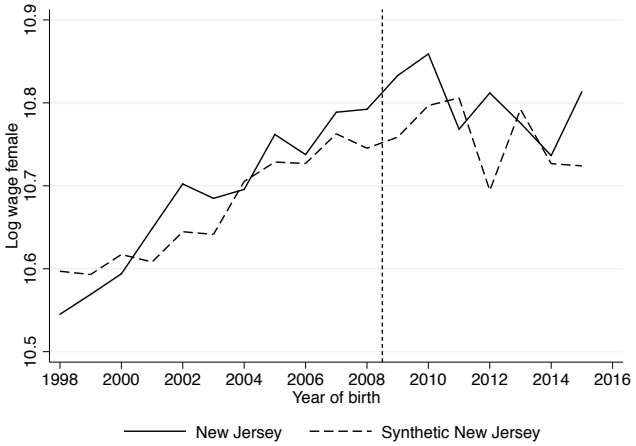


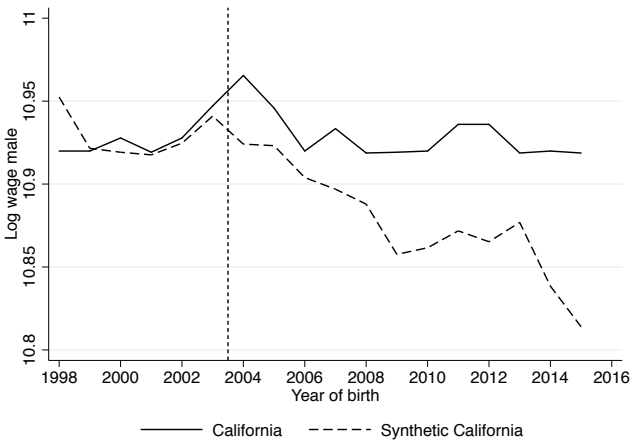



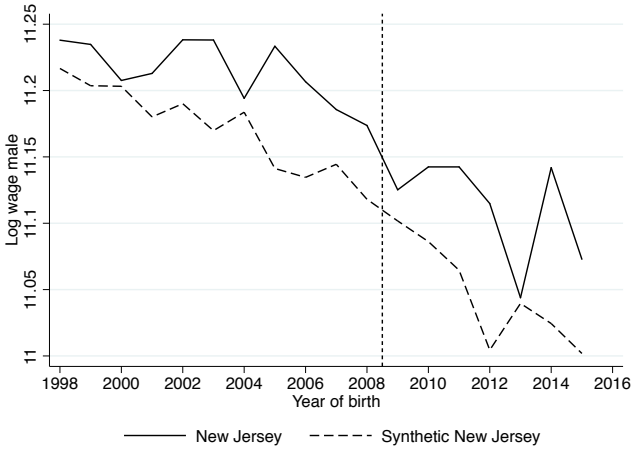



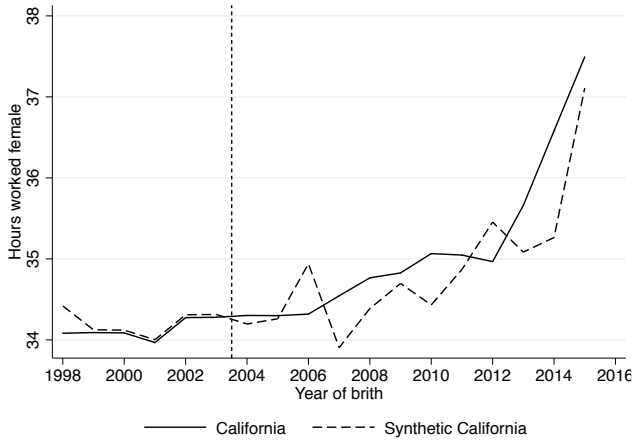



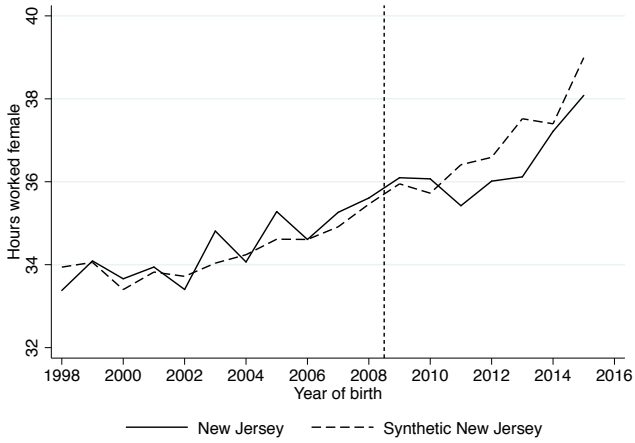




Hours worked female
34
35
36
37
38
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
Year of birth
California
Synthetic California


Hours worked female
32
34
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40
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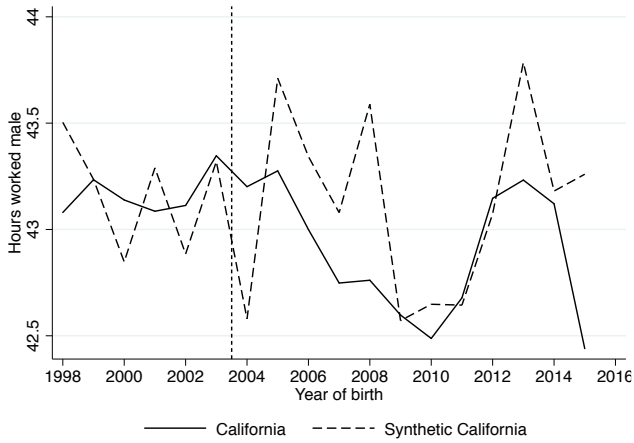
2012
2014
2016
Year of birth
New Jersey
Synthetic New Jersey


Hours worked male
42.5
43
43.5
44
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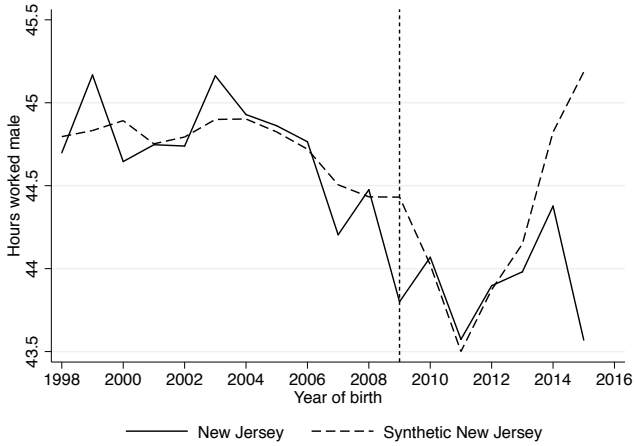
2016
Year of birth
California
Synthetic California


Hours worked male
43.5
44
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Year of birth
New Jersey
Synthetic New Jersey