Effect of New Jersey's Paid Family Leave Policy of 2009 on Maternal Health and Well-Being[1]

Ipshita Pal

Assistant Professor of Social Sciences

St John's University

New York

[1] This paper is drawn from my doctoral dissertation completed in 2016 at Columbia University School of Social Work. I gratefully acknowledge the thoughtful comments and feedback from my advisor, Prof Jane Waldfogel, and members of my dissertation committee, Professors Irv Garfinkel and Neeraj Kaushal at the Columbia University School of Social Work, Prof. Thomas DiPrete at the Department of Sociology, Columbia University, and Prof. Wen-Jui Han at the New York University Silver School of Social Work. The paper has also benefitted from comments and suggestions from participants at the Association of Public Policy Analysis and Management (APPAM) Fall Research Conference, Miami FL, November 2015 (especially Dr. Anja Tolonen, Barnard College Department of Economics), Society for Social Work Research (SSWR) Conference, Washington DC 2016, Work and Family Researchers Network meeting 2016, Washington DC and the APPAM regional student conference, Arlington VA, April, 2016, (particularly Professors Lee Fritschler and Laurie Schintler of George Mason University School of Policy, Government and International Affairs). Remaining errors and omissions are my own. Please address comments and questions to i.pal@columbia.edu.

Abstract

While the United States lacks a national paid parental leave policy, a few states have built on existing social insurance programs to ensure a short period of *paid* parental leave immediately after childbirth. These are promising developments with the potential to improve the quality of life of many workers, particularly new mothers, since only 12% of private sector workers have access to paid family leave through employers and one in four mothers return to work within 10 days of childbirth as they cannot afford more time off, at potentially a great cost to their own and their families' well-being. I examine the effect of the 2009 policy change in New Jersey on women's subjective well-being, a cognitive evaluation of the state or quality of one's life, and multiple self-reported indicators of well-being –general health, physical health, stress, depression and emotional well-being. Using data from the Behavioral Risk Factor Surveillance System annual surveys and random child selection modules from 2005 to 2012, I identify potentially eligible mothers from individual level variation in month-year of child's birth and state level variation in parental leave policies, and employ a triple difference research design. I find no evidence of a significant effect of the 2009 policy change in New Jersey on women's subjective well-being overall, but strong evidence of improvements in women's physical health. I further find variation in effects in subgroup analyses, with significant positive effects on the well-being of employed single mothers and women from lower-middle income families, and significant improvements in the experience of stress, depression and emotional well-being for relatively disadvantaged groups. Results are consistent with prior research that finds introduction of paid policies (or increases in cash benefits) to induce relatively larger increases in leave taking for such relatively disadvantaged groups.

Parental Leave Policies provide job-protected leave from work, along with some wage replacement, to new parents. Their chief purposes are to ensure economic security during the childbirth period, allow mothers to physically recover from the stresses of childbirth and help families bond with and adjust to a new child. Of 185 countries recently surveyed by the International Labor Organization, all but two –the United States and Papua New Guinea – provide cash benefits to cover some portion of the lost income during the period of maternity leave (International Labor Organization 2014)[1]. While the United States lacks a national paid parental leave policy, three states – California from 2004, New Jersey from 2009 and Rhode Island from 2014 –have built on existing social insurance programs to ensure that a short period of *paid* parental leave is available to eligible workers in the period immediately after childbirth.[2] These are important and promising developments with the potential to improve the quality of life of many workers, particularly new mothers, since only 12 per cent of private sector workers have access to paid family leave through their employers and one in four mothers in the US return to work within 10 days of childbirth as they cannot afford more time off , at potentially a great cost to their own as well as their families' health and well-being (Bureau of Labor Statistics Employee Compensations Survey, 2011; Klerman, Daley and Pozniak, 2013). In this paper, I examine the effect of the policy change in New Jersey on women's subjective well-being, a cognitive evaluation of the state or quality of one's life, taking all things into consideration[3].

Using data from the Behavioral Risk Factor Surveillance System (BRFSS) annual surveys and random child selection modules from 2005 to 2012, I identify potentially eligible mothers from individual level variation in month-year of child's birth (BRFSS) and state level variation in parental leave policies, and employ a difference in difference research design. Along with overall life satisfaction or life evaluation, I also look at multiple self-reported indicators of well-being, such as self-rated general health, physical health, stress, depression and emotional well-being and whether adequate social and emotional support is available. To briefly preview the results, I find no evidence of a significant effect of the 2009 policy change in New Jersey on women's subjective well-being overall, but strong evidence of improvements in women's physical health. I further find variation in effects in subgroup analyses, with significant positive effects on the life satisfaction of employed single mothers and women from lower-middle income families, as well as significant improvements in the experience of stress, depression and emotional well-being for such relatively disadvantaged groups.

I build on prior research and extend it in a few different ways. Firstly, the recentness of the above mentioned state-level policy changes means that only a small body of research has so far examined their effects, primarily on leave taking, employment, and employer responses in California (Rossin-Slater, Ruhm and Waldfogel 2013; Baum and Ruhm, 2016; Applebaum and Milkman 2015) and leave taking, child vaccinations and employer responses in New Jersey (Lerner and Applebaum 2014). To my

knowledge, there is no existing published work that has investigated the effects of the 2009 policy change in New Jersey on women's well-being. Second, the study also draws inspiration from the renewed emphases on using subjective measures to describe well-being and evaluate policies (Blau, 1998; Layard, 2006, 2010; Stiglitz, Sen and Fitoussi, 2010; Deaton and Stone, 2013). While such measures have been used by researchers in examining the effects of parental leave and child care policies in Europe and Canada (d'Addio, Chapple, Hoherz and Landeghem, 2014; Brodeur and Connolly, 2013; Schober and Stahl, 2016) and the 1994 welfare reform in the US (Herbst 2013), to my knowledge, there has not been any such investigation into the effect of US parental leave policies. Thirdly, subjective well-being or overall life satisfaction may be particularly suited to the examination of effects of parental leave policies since some of the most important expected consequences of such policies –parental bonding, family security, adaptation to new parenthood, adjustment to a child, adjustment away from work -- are difficult to observe in conventional data, limiting the outcomes available to researchers to measure the overall well-being consequences of the policy. Parents' own assessment of the state or quality of their lives, presumably takes into account several such relevant factors that are likely unobserved in data and might shed some light on these effects.

The paper is organized as follows – Section 1 discusses theoretical frameworks explaining the potential effect of parental leave policies on individual subjective well-being; section 2 reviews prior research on the effects of parental leave policies on various dimensions of individual well-being including but not limited to subjective well-being, the predictors of individual subjective well-being and the relationship of parenthood with subjective well-being; section 3 describes the methodology used in the paper and section 4 describes findings. Section 5 concludes with a discussion of the findings and their implications for policy and research.

1. Theory

Based on research from psychology, sociology and economics, scholars have posited that government policy impacts subjective well-being through the following channels – income, employment, education, family, community, environment, physical health and mental health (O'Donnell, Deaton, Durand, Halpern, and Layard, 2014). Based on O'Donnell et al and the extensive empirical literature on the effects of parental leave policy (reviewed in the next section), parental leave policy may be posited to impact parents' subjective well-being (SWB) through five channels –physical health, mental health, income, employment and family. Firstly, time away from work directly allows for physical recovery after child-birth, less stressful breast-feeding episodes, and positive emotional benefits of bonding with the child. Secondly, employment-protection and income replacement components of parental leave policy are expected to support economic security of the family, counteract the rise in expenses associated with a new

child and help maintain mothers' employment continuity and firm-specific human capital. Thirdly, by allowing parents the time for bonding and by encouraging fathers to take leave and be more involved with child-care, parental leave policies can be expected to enhance parents' subjective well-being.

The limitation with this model is that the effect of parental leave policy on well-being can only be explained if parents are known to have actually taken leave. In a detailed review of the effects of various early childhood programs, Currie and Rossin-Slater (2015) posit that the guarantee of leave itself, particularly job-protected leave, may reduce maternal stress, during and immediately after pregnancy. Arguably, the additional guarantee of cash benefits –as is the case for California and New Jersey's paid family leave policies –is likely to further reduce maternal stress in the same period, and have a direct bearing on parental subjective well-being.

A standard idea in microeconomics is that within the constraints of time and resources, rational individuals make choices that they believe would maximize their happiness or utility. Extending this idea, the potential effect of parental leave policies on subjective well-being may be explained in terms of the expansion of choices that such a policy offers parents. Latent subjective well-being could be considered a proxy for utility (albeit an imperfect one, as argued by Benjamin, Heffetz, Kimball & Rees-Jones, 2012 and Bertrand, 2013) in a simple theoretical model where rational parents choose to allocate their time (time at home) and money (income) into improving health, economic security, bonding with child and anything else that matters to them, based on what they think would maximize their subjective well-being [4]. Parental leave policy is exogenous to this model. Therefore, if the state were to mandate a paid family leave policy, it would in effect simply shift the parents' "budget line" outward or expand the set of possible (time, income) combinations, thereby making it possible to reach a higher level of well-being[5].

Such a policy could also have negative effects on subjective well-being for a number of different reasons. First, Klerman and Leibowitz (1997) posited that leave policies can induce behavioral changes, such that some mothers who would prefer to return later, may be induced to return to work soon after childbirth. Second, scholars have also argued that for some mothers, work may be more complementary to health than time at home, while the opposite may be true for others. Recent research has also found early maternal employment to be associated with elevated depressive symptoms, parenting stress and worse self-rated health, measured 6 months after child birth (Chatterji, Markowitz, & Brooks-Gunn, 2013). Third, scholars have pointed to the potential for parental leave policies to perpetuate or induce a more gendered division of care work (Bergman 1997, 2008) and to shift mothers' preferences away from work (Gangl & Ziefl 2015). Fourth, if people's expectations of the positive effects of the policy do not take into account potential costs – such as tedious procedures including filling of several applications, understanding details of insurance policies, requesting certifications and obtaining them from one's employer and health providers, all for a small amount of benefit –the overall well-being effect may be negligible and could even

be negative. Heckman (2010) presents a formal treatment of a similar problem, positing that agents make their choices under imperfect information and the decision maker selecting treatment may be different from the individual who experiences the outcomes, such that agents may regret their choices or the choices made for them if realizations differ from anticipations. Finally, for high skilled women, introduction of such a policy could lead to a strong expectation of negative career consequences such as occupational segregation, being pushed into "feminized enclaves", decrease in the odds of attaining managerial positions, or increases in the gender earnings gap –all results that have been found in studies of advanced industrial countries (Mandel and Semyonov 2005, 2006; Shalev 2008; but see also Korpi, Ferrarini & Englund, 2013). Through each of these mechanisms, paid parental leave policies could negatively affect women's subjective well-being.

Taken together, the overall effect of state parental leave policies on women's subjective well-being therefore remains theoretically indeterminate. Moreover, the overall effect will likely depend on which groups of women are affected. The additional benefit is unlikely to have any impact on those women who already had more generous paid leave policies from their employers. On the other hand, to the extent that the new policies make parental leave more accessible to groups who would not have been able to afford unpaid leave, substantial gains in subjective well-being may be observed among traditionally disadvantaged groups such as lower income or unmarried parents. To the extent that the data allows, important insight may thus be available from disaggregated analyses, particularly with respect to marital status, family income level and education level.

2. Prior Research

Researchers have used sophisticated design-based empirical strategies to identify causal effects of parental leave policies on both objective and subjective measures of well-being. Two features stand out in this body of empirical literature –first, evidence on the effects of parental leave policies is stronger for some aspects of well-being than others and the effects tend to vary by the duration of leave or nature of policy change examined. The earliest studies examining California's paid parental leave policy, tend to find positive effects on parents' leave-taking, work hours, job continuity and employment but ambiguous or insignificant effects on income (Rossin-Slater, Ruhm and Waldfogel, 2013; Baum and Ruhm, 2016) and no negative effects on employers both in California and New Jersey (Appelbaum and Milkman, 2013, 2015; Lerner and Applebaum 2014).[6] Recent evidence also indicates increased leave taking by fathers, mainly of first-born children and in occupations with a high share of female employment, increases in joint leave-taking (Bartel, Rossin-Slater, Ruhm, Sterns and Waldfogel 2015) and increases in maternal time spent on childcare (Goodman 2014). International evidence on paid leave policies tends to report positive employment and wage effects for short durations of leave in aggregate cross-national studies

(Ruhm, 1998; Akgunduz and Plantenga, 2012; Thevenon & Solaz, 2013) but negative effects for longer durations; further, results are mixed in single-country studies with individual level survey or administrative data (Lalive and Zweimüller 2009; Wurtz-Rasmussen 2010; Schonberg and Ludstek, 2014). Cross-national research also finds evidence of positive effects of paid leave policies on child health (Ruhm 2000; Tanaka 2005, Shim 2015). Consistent with these findings, researchers tend to find positive effects of US state parental leave policies on child health (Washbrook, Ruhm, Waldfogel, and Han, 2011; Stearns, 2015; Adema, Clarke and Frey,2015) including increases in breastfeeding (Huang & Yang, 2015) and vaccination rates (Adema et al 2015). However, evidence pertaining to maternal health is inconclusive; Chatterji & Markowitz (2005, 2012) find positive effects for some sub-groups, while Washbrook et al find no effects[7].

A second feature of the empirical literature on the effects of parental leave policies is that it tends to report differential consequences for parents of different socio economic statuses. Researchers examining US family leave policies have found that unpaid leave policies induce small and inconsistent effects on leave-taking (Klerman and Leibowitz, 1997; Waldfogel 1999; Baum 2003 a,b; Han & Waldfogel, 2003), are primarily utilized by relatively advantaged groups, such as college educated and married mothers (Han, Ruhm and Waldfogel, 2009) and do not make a difference for lower income families (Kerr 2016). On the other hand, after California became the first state in the US to put into effect a paid family leave insurance program, researchers found that the program doubled the overall use of maternity leave, increasing it from an average of three to six weeks for new mothers, with particularly large benefits for Black mothers and other disadvantaged groups (Rossin-Slater et al 2013). International research also finds the largest increases in leave-taking among disadvantaged women when a parental leave system has moved from partially paid to almost fully paid (evidence from Norway in Carneiro, Løken, & Salvanes, 2010). In two separate studies, Chatterji and Markowitz (2005, 2012) examined the effect of the length of maternity leave on mothers' physical and mental health and found that for mothers who returned to work within nine months of child birth, less than eight weeks of paid parental leave increased the probability of reporting a poorer health status and less than twelve weeks of total leave (paid or unpaid) increased depressive symptoms. Their results were however consistent for only certain sub-groups of mothers, such as married Non-Latina White mothers who returned to work full-time. Finally, new evidence from the New Jersey PFL shows increased immunizations for children, with relatively larger policy effects for children from low income families (Adema, Clarke and Frey, 2015). Taken together, research on the impact of family leave policies on physical and mental health and economic security, suggests varied effects by sub-group, with the positive benefits more likely to be available only to socio-economically advantaged groups if the leave does not provide income replacement and relatively large gains for the relatively disadvantaged when paid family leave policies are introduced.

Overall, prior research does not clearly indicate the expected direction of the overall effect of US state-level paid parental leave policies on subjective measures of well-being. To my knowledge, there has been no investigation into the effect of parental leave policies on parents' subjective well-being in the US. A few recent studies do however examine the same or related question for other countries. Using long term individual panel data from Germany (German Socio Economic Panel) and Britain (British Household Panel Survey), d'Addio, Chapple, Hoherz and Landeghem (2014) found significant positive effects of parental leave policies on women's SWB. On the other hand, an aggregate cross-national study of 12 OECD countries over the period 1969-1993, found no effects of maternity leave rights on women's SWB but positive effects of rights to abortion and birth control (Pezzini 2005). In related research, Brodeur & Connolly (2013) examined the effect of an increase in child care subsidies in the province of Quebec, Canada, on parents' subjective well-being and found a small decrease in parents' life satisfaction.[8] [9]

3. Methodology

3.1 Data and Measures

I use individual-level data from the Behavioral Risk Factor Surveillance System (BRFSS) annual surveys 2005-2012 and associated Random Child Selection modules. Conducted by the Center for Disease Control (CDC), the BRFSS is the largest continuous health survey in the world and it surveys U.S. residents primarily regarding their health-related risk behaviors, chronic health conditions, and use of preventive services. From 2005, the survey has included questions on life satisfaction. BRFSS data is suitable for studying the effects of New Jersey's Paid Family Leave (NJ PFL) as it observes life satisfaction and other related well-being outcomes for periods both before and after the policy came into effect (July, 2009) and allows identification of likely affected women through information on state, employment and children's birth month/year. Its large sample size also allows for a comparison among respondents belonging to different meaningful subgroups of the population.[10] Weighted, the data is nationally representative of the adult US population. I restrict my analytic sample to working age adult women aged 18-65 years and mainly focus my analyses on the prime working age sample of 25-44 years old women.

My main outcome variable of interest is *subjective well-being*, operationalized using a dummy variable for whether a respondent is "very satisfied with life" or not. I use as my dependent variable, answers to the question "In general, how satisfied are you with your life?" The response categories are very satisfied, satisfied, dissatisfied, very dissatisfied. Similar to prior studies using the BRFSS data to examine subjective well-being in the US (Oswald and Wu, 2010), I note that responses to this question

are skewed, with the two positive responses significantly more common. I therefore recode this variable into a dichotomous variable indicating whether a person is "very satisfied" or not. On average, 46% of women in my sample report being very satisfied.

Being a health dataset, the BRFSS also provides information on multiple indicators of health and mental health, allowing me to check for policy effects on various dimensions of well-being and provide some insight into potential mechanisms through which paid parental leave policies might affect subjective well-being[11]. Specifically, I examine effects on (a) *self-rated general health status* – this is a standard self-reported health measure with the categories excellent, very good, good, fair and poor; I dichotomize the variable into "very good or excellent health" or not; (b) *physical health* –physical health is measured by asking the respondent how many days in the past month, her physical health was not good (including injuries and illnesses); (c) *emotional and mental health* –respondents are asked to report how many days in the past month they experienced stress, depression or emotional problems, (d) *emotional and social support* –respondents are asked whether they feel they have adequate social and emotional support when needed; this is a categorical variable with possible responses always, usually, sometimes, never and rarely; I again create a dummy for "always or usually has emotional and social support" or not. I leave the continuous measures, (b) and (c) as they are, so as to not lose information from dichotomization.

The New Jersey paid family leave insurance policy and eligible groups

The New Jersey paid family leave insurance policy (NJ-PFL) provides 6 weeks of paid leave at 67% wage replacement and up to a maximum weekly benefit of $584. Since this leave can be taken to bond with new children or care for family members, theoretically both parents and non-parents could be "treated". However, research shows that close to 90% of the claims in California and 82% of claims in New Jersey are for bonding with children (National Partnership for Women and Families, 2015). In this study, I therefore focus on parents' (mothers') well-being.

A key challenge in cross sectional datasets that capture the kind of outcome measures that are of interest to studies of parental leave policy, is that one typically does not observe both pre and post birth employment. This is problematic since pre-birth employment is what determines eligibility and therefore, I must assume the observed post pregnancy outcome to be highly correlated to the eligibility conditions (Baker and Milligan 2008 make the same assumption). In NJ, the program covers employers of all firm sizes, both private and public, and for both part time and fulltime workers, with a weekly earnings of $165 or more for each of 20 prior weeks or $8300 in the past 12 months (i.e. $159/week earnings). It turns out that these earnings-based eligibility criteria are at a very low threshold for women in all counties and all skill levels, such that for employed New Jersey women, the policy is near-universal in coverage[12].

In my main analyses, I include all respondents, whether employed for wages, self-employed, unemployed or out of labor force, since parenthood itself as well as leave policies might have some employment effects that in turn might influence individual well-being. I include homemakers and retirees among those out of the labor force but exclude students. I additionally exclude observations whose employment status is recorded as unable to work since disability has a strong association with subjective well-being and including it might distort the effects that are the focus of this study (Graham 2008. Oswald and Powdthavee 2008). I additionally conduct analyses on the sample restricted to those who are employed. Doing so is also justified since taking parental leave implies a return to employment and so these analyses should shed better light on parents who are continuously employed and most likely to be affected by such a policy. For the same reason, I do not include the self-employed in this part of the analysis.

Since benefits can be claimed only within the first year of childbirth, I only consider new mothers –those with a child under 1 year – as my main "treatment" group. Since theoretically, the well-being effects could be anticipatory or could linger past the actual period of leave taking, I also examine effects on a second treatment group where I examine soon-to-be parents and a third treatment group where I examine parents after the first year of birth, i.e. with toddlers 13-36 months old.

Identification Strategies

BRFSS data is particularly suited to complement prior research since it allows more precise identification of new mothers using month and year of child's birth, allows comparison between mothers of infants for pre and post policy period for New Jersey and also helps to adjust for key individual and family indicators. My initial empirical strategy is to compare the well-being of women who had a birth before the policy became effective in July, 2009 in New Jersey, to those who had a birth after July, 2009 in New Jersey, adjusted for individual level characteristics. This approach relies on and assumes random variation in timing of births over the period under study and may be violated if for women contemplating a pregnancy, knowledge of when a policy would come into effect, induces some women to choose to not get pregnant before such a policy would be useful to them. This effect is unlikely to be large since policy awareness tends to be low and leave taking effects are usually observed with a lag (Appelbaum and Milkman 2013, 2015), and therefore, childbirth over the period of observation can plausibly be assumed to be randomly assigned. I begin my analysis by estimating the following model that provides mean subjective well-being of New Jersey mothers who had births before the policy change to those who had a birth after the policy change, adjusted for various individual level factors such as age, education, marital status, race and ethnicity :

$$Y_i = \beta_1 X_i + \beta_2 BirthPost_i + \varepsilon_i \qquad (3.1)$$

Where Y is the outcome of interest, X are conditioning variables and *BirthPost* indicates whether an individual had a *birth* after the policy change, i.e. after July 2009. The coefficient on *BirthPost* may be expected to capture the effect of the policy change, however, it will likely also capture unobservable and systematic differences between the pre and post policy birth cohorts that are correlated to the health or well-being outcome of interest. This is a particular concern here since the post policy period corresponds with a time of country-wide economic recovery, and parents are more likely to choose to have children when they are economically secure, leading to possible systematic differences in the parents who give birth before or after July 2009 or those who become pregnant in 2008 versus those who do so afterwards. The BRFSS data provides information on pregnancy status as well, so one way to check for this issue is to compare characteristics of women who are pregnant in the pre and post policy periods (see Appendix C).

The now-standard approach to addressing such selection issues is to employ a difference in difference design to compare changes in outcomes for eligible mothers in New Jersey (those with a child less than 12 months) observed before and after the policy implementation in July 2009, to corresponding differences for a control group of mothers in non-policy states, who would not have been affected by the New Jersey policy change. Using this group will also address the potential problem of differential selection into parenthood post-recession.

I operationalize the DD approach using the following estimation equation and provide results from linear probability models:

$$Y_{it} = \beta_0 + \beta_1 Treat_i + \beta_2 Post_t + \beta_3 (Treat_i * Post_t) + \beta_4 X + \delta_t + \varepsilon_{it} \qquad 3.2$$

Post is a dummy indicator taking the value of 1 if a woman was surveyed in July 2009 or after. *Treat* is a treatment dummy that takes the value 1 for women with a child of 12 months or less in New Jersey and 0 if she has an infant in a state where there was no change in parental leave policies.[13]

$\mathbf{X_{itm}}$ is a vector of individual characteristics; In my main models, I use a standard set of demographic controls – age and age-squared, (in alternate models, i use four age groups twenties, thirties, forties and fifties), race and ethnicity (non-Hispanic white, non-Hispanic black, Hispanic and other), marital status (married, previously married or never married) and education (less than high school, high school diploma, some college and bachelor's degree); I also estimate models where I control for the number of children, gender of the selected child, labor force status and family income category –not all are included at the same time; $\boldsymbol{\delta_{stm}}$ is a vector of state, year and month fixed effects and $\boldsymbol{\varepsilon_{itm}}$ is an individual-specific error term. $\boldsymbol{\beta_3}$ is the coefficient of interest and provides an estimate of the effect of New Jersey's paid parental leave policy on new parents.[14] Linear time trends, state-year fixed effects and state specific linear time trends are also included in some models.

I examine three separate groups of women for identifying policy effects –(i) mothers of infants – this is my main treatment group (ii) mothers of toddlers –I use this group because theoretically, there might be lingering effects on subjective well-being even beyond the first year after birth (iii) pregnant women –I include women before birth as anticipatory effects may be present, especially since the guarantee of paid leave will likely lessen stress and improve overall quality of life.

I use two standard within-state control groups of women with older children, 5 to 12 years, and women with no children[15] along with mothers of infants born in non-policy states. I make the key assumption that changes in, but not levels of, the health or well-being outcome of interest would have been the same for the treated and control groups in the absence of the policy.

Finally, I combine the control groups from the above analyses to implement a triple difference equation:

$$Y_{it} = \beta_0 + \beta_1 Infant_i + \beta_2 (Infant_i * Post_t) + \beta_3 (Infant_i * NJ) + \beta_4 (Post_t * NJ) + \boldsymbol{\beta_5} (Infant_i * Post_t * NJ) + \beta_6 X + \delta_{stm} + \varepsilon_{it} \quad (3.3)$$

Where $Infant_i$ represents the main treatment group and is a dummy taking the value of 1 for mothers of infants, 0-12 months; *NJ* is a dummy for New Jersey. Rest are as above. β_5 is the coefficient of interest in this model. Following prior research, I estimate linear probability models due to their ease of direct interpretation[16]. Following now-standard approaches to addressing serial correlation of the error terms in case of individual level data with variation of policy treatment at a group level, I report robust standard errors clustered at the state level (Bertrand, Duflo and Mulainathan 2004).[17]

I control states that are similar to NJ based on some relevant criteria. I mainly focus on estimates using states with similar aggregate subjective well-being –Illinois, Indiana, Maryland, Michigan, Minnesota— as my control states, which I select from prior research based on BRFSS 2005-2008 data (Oswald and Wu 2010).[18] I also check robustness of results to using two alternate sets of control states – (a) control states that are similar to NJ, with regard to social and economic status for women, based on state-wise rankings on women's median earnings, percentage of women in managerial and professional occupations and percentage of women with health insurance, created by the Institute for Women's Policy Research (IWPR) using data from the American Community Survey (ACS) 2009 and 2012[19]. These states include Arkansas, Georgia, Idaho, Illinois, Maine, Maryland, New Hampshire and Virginia; (b) control states with similar work and family environment as NJ, based on state-wise data on infant care costs, gender difference in parental labor force participation and overall work-family environment, again provided by IWPR (2015)and include Arizona, Florida, Nebraska, Oklahoma, Pennsylvania. [20]

Finally, a potential challenge to the identification strategy is that the New Jersey – Pennsylvania-New York region sees a lot of inter-state commute for work. 14% of employed NJ residents work outside of NJ and 7% of NJ workers are not residents of NJ (2009-2013 American Community Survey

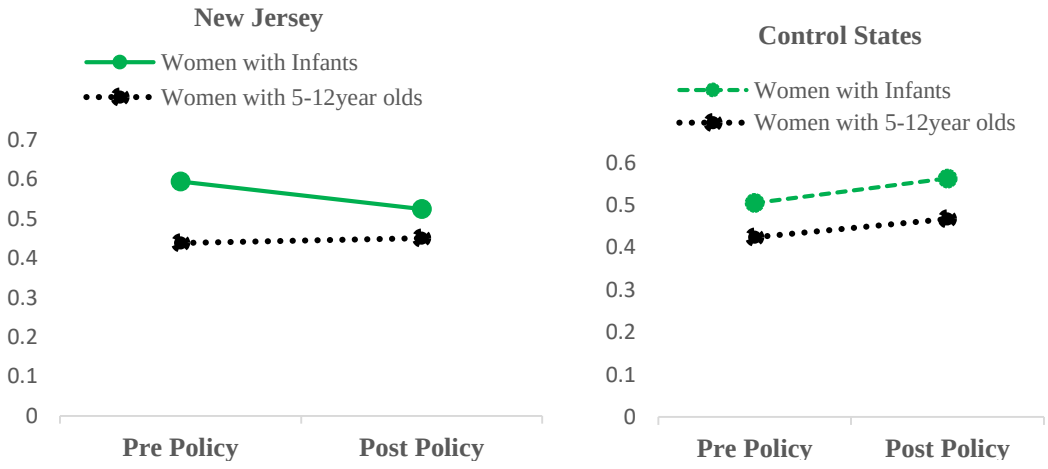
Commuting Flows). My identification strategy relies on state of residence whereas the policy applies to workers (this is standard in the literature but California does not see as high commuter flows as New Jersey). I address this concern in supplementary analysis but note that adjusted estimates may not be an improvement, and may in fact be biased, since commuting is consistently found to have a negative association with subjective well-being (Stutzer and Frey 2005).

4. Results

4.1 Descriptive Results

Figure 1 presents mean subjective well-being for women in New Jersey before and after the policy came into effect. 59.5% of women with infants report being very satisfied with life in the pre-policy period, compared to 52.5% in the post-policy period. Control states show the opposite scenario, with 50.5% of women with infants reporting being very satisfied with life in the pre-policy period and a larger proportion, 56.3% in the post-policy period. Neither of these differences are however statistically significant. For the control group of women with older children, 5-12 years, (dotted lines in above panels) the trend line appears flat, showing minor difference in the pre and post policy period in New Jersey.[21]

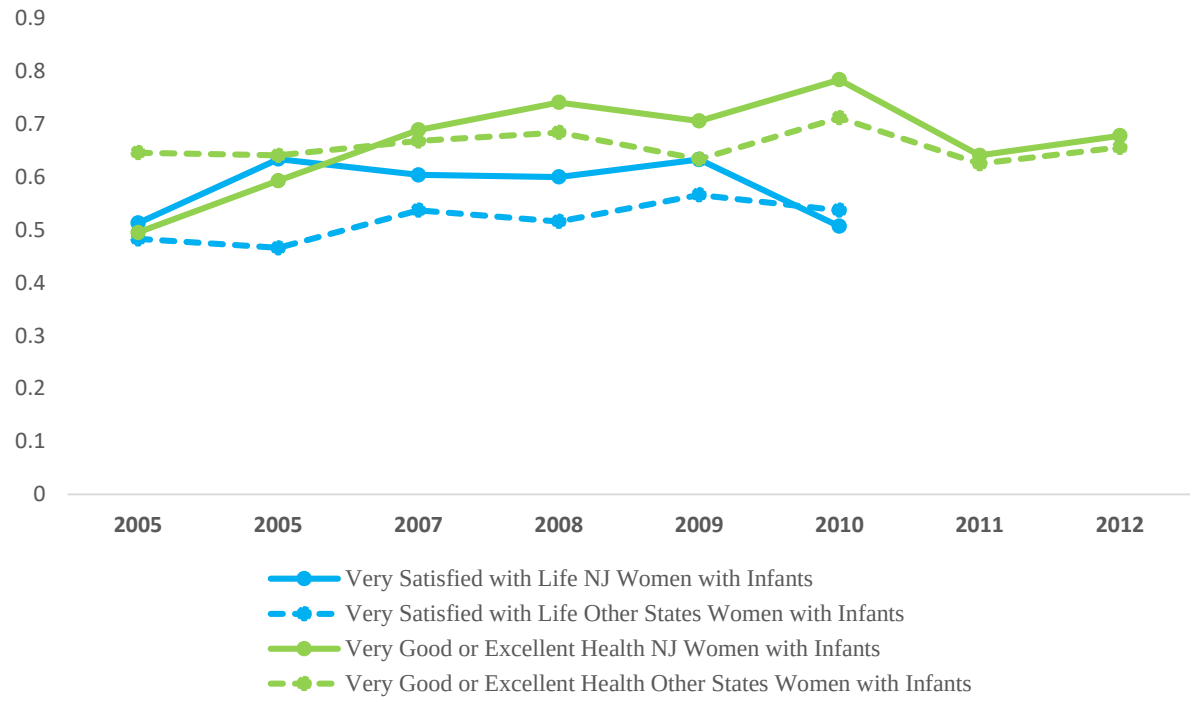
Fig. 1 Mean subjective well-being for women with infants in New Jersey and in control states, before and after the 2009 policy change, compared to women with older children



Notes Means are weighted by BRFSS annual survey final sampling weights. Pre-Policy means before July, 2009. Non Policy States include states that are closest to New Jersey in state level subjective well-being in the period 2005-2008 based on prior research (Oswald and Wu 2010). These control states include Maryland, Minnesota, Illinois, Indiana and Michigan. Differences of pre and post policy means are tested using a bivariate regression of *very satisfied* on *post* dummy for each group; all regressions are weighted by final sampling weights. In New Jersey, differences for life satisfaction are not statistically significant for either group, but are marginally significant for health status $p<0.10$ in parents with infants. In the Control States, differences pre and post policy are statistically significant for women with 5-12 year olds ($p<0.05$) for life satisfaction.

Figure 2 presents more detailed trends by year for select well-being outcomes and suggests that the parallel trends assumption likely holds for the key outcome, life satisfaction, but see also Appendix A, Fig A1, which suggests that the parallel trends assumption may be violated for some of the additional well-being measures. [22]

Fig 2. Trends for Selected Well-being Outcomes for Women with Infants in New Jersey and in Other States, 2005 – 2012



Notes Vertical line shows the point when the New Jersey PFL became effective, July 2009. Means are weighted by BRFSS annual survey final sampling weights. Mean for 2007 "very satisfied with life" has very high margins of error and might be unreliable. Non Policy States include states that are closest to New Jersey in state level subjective well-being in 2005-2008, based on prior research (Oswald and Wu 2010). These control states include Maryland, Minnesota, Illinois, Indiana and Michigan.

4.2 Results from Difference in Difference Analyses

Table 1 presents results from both difference in difference and triple difference analyses showing estimated effects of New Jersey's paid family leave policy on the subjective well-being of new mothers. Overall, I do not find any evidence of a significant policy effect on women's subjective well-being.

Table 1 Regression Coefficients showing Estimated Effects of the New Jersey Paid Family Leave Insurance Policy on Women's Subjective Well-being

	Full Sample, 18-65 years			**Prime Working Age, 25-44 years**			**25-44 years and Employed**	
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(3)
Post*NJ	-0.013	-0.017	-0.007	-0.011	-0.011	-0.003	0.076	0.092
	(0.019)	(0.019)	(0.019)	(0.024)	(0.024)	(0.026)	(0.036)	(0.037)
Observations	1,932	1,932	1,932	1,527	1,527	1,527	890	890
Infant*Post	-0.019	-0.021	-0.018	-0.039	-0.041	-0.043	-0.010	0.002
	(0.053)	(0.053)	(0.053)	(0.059)	(0.058)	(0.059)	(0.076)	(0.076)
Observations	4,097	4,097	4,097	3,105	3,105	3,105	1,928	1,928
$Infant_A$*Post	-0.015	-0.021	-0.013	-0.049	-0.053	-0.048	-0.004	0.010
	(0.051)	(0.051)	(0.051)	(0.060)	(0.059)	(0.060)	(0.076)	(0.077)
Observations	15,130	15,130	15,130	3,185	3,185	3,185	2,491	2,491
Infant*Post*NJ	0.013	0.008	0.018	-0.009	-0.013	-0.003	0.075	0.092
	(0.026)	(0.024)	(0.024)	(0.038)	(0.037)	(0.038)	(0.052)	(0.052)
Observations	14,922	14,922	14,922	11,422	11,422	11,422	7,238	7,238
$Infant_A$*Post*NJ	-0.004	-0.012	-0.001	-0.038	-0.043	-0.030	0.036	0.056
	(0.021)	(0.019)	(0.020)	(0.024)	(0.024)	(0.024)	(0.028)	(0.030)
Observations	63,200	63,200	63,200	11,407	11,407	11,407	9,043	9,043
Pre Policy Mean	0.551	0.551	0.551	0.591	0.591	0.591	0.618	0.618
	(0.026)	(0.026)	(0.026)	(0.028)	(0.028)	(0.028)	(0.037)	(0.037)

Source Behavioral Risk Factor Surveillance System Survey Data. 2005-2012. *Notes* Each of the above coefficients is from a separate linear probability model. Row 1 in the top panel presents DD coefficients comparing mothers of infants in New Jersey and in control states before and after policy. Row 2 and Row 3 in the top panel presents DD coefficients comparing NJ mothers of infants with NJ mothers of older children (*Infant*) or NJ women with no children ($Infant_A$), before and after the policy change. The bottom panel presents DDD coefficients comparing NJ mothers of infants to NJ mothers of older children or NJ women with no children (notations as before), before and after the policy change with similar groups before and after policy in control states. Control states are those closest to NJ in state level subjective well-being, based on prior research (Oswald and Wu 2010) and include Maryland, Minnesota, Illinois and Michigan. Robust standard errors clustered at the state level in parentheses (Infant*Post models have robust standard errors); *** p<0.001, ** p<0.01, * p<0.05. Each column represents a separate model specification. Model 1 includes controls for demographic and family characteristics –age, age squared, race and ethnicity, education, marital status, number of children, along with year of survey, month of survey, state of residence and state-specific linear time trends (except in case of Infant*Post models which are run on the New Jersey sample and therefore do not control for state); Model 2 additionally includes a control for labor force status and Model 3 additionally includes family income. I also ran models (not presented here) with age categories instead of age and age squared, linear time trends instead of year fixed effects, state*year dummies instead of state specific linear time trends and models where two or more of the control variables are interacted. None of these changes make a meaningful difference to the main effect of interest.

Since they combine the within-state and cross-state control groups and produce more efficient results, I prefer the triple difference models and going forward, only focus on the 25-44 age group, who are more likely to be dealing with childbirth. I also continue to separately examine the employed women, who are most likely to be affected by the policy. Table 2 shows estimated effects on related self-reported measures

of well-being that may also shed some light on potential mechanisms by which the parental leave policy might affect mothers' subjective well-being. Once again, I focus on the 25-44 age group and additionally restrict my analysis to the employed. I do not find any evidence of policy-related changes in general health status; I do however find some evidence of a negative effect on mental and emotional well-being, with a half day increase in the number of days a woman reports experiencing stress, depression or emotional problems in the post-policy period. More importantly, I find a significant improvement in physical health for women in the 25-44 age group overall and even stronger improvements for those employed. Finally, employed women seem to experience better emotional and social support in the post policy period.

Table 2 Regression coefficients showing estimated effects of the New Jersey paid family leave insurance policy (July, 2009) on related measures of well-being for women 25-44 years

	Very good or excellent self-reported health (LPM)		No. of days last month experienced stress, depression or emotional problems		No. of days last month physical health not good		Usually or always has adequate emotional and social support (LPM)	
	All	**Employed**	**All**	**Employed**	**All**	**Employed**	**All**	**Employed**
Infant*Post*NJ	0.033	0.037	0.538*	0.832	-0.873+	-1.417*	-0.007	0.072+
	(0.030)	(0.019)	(0.158)	(0.434)	(0.369)	(0.462)	(0.008)	(0.033)
Observations	14,085	8,965	13,970	8,904	13,977	8,911	11,415	7,234
Pre Policy Mean	0.708	0.763	2.446	1.808	2.239	1.866	0.851	0.884
	(0.026)	(0.032)	(0.339)	(0.357)	(0.334)	(0.404)	(0.020)	(0.024)

Notes Robust standard errors clustered at the state level in parentheses; *** p<0.001, ** p<0.01, * p<0.05, + p<0.1; Each coefficient is a DDD coefficient from a separate linear regression model comparing NJ mothers of infants to NJ mothers of older children before and after the policy change with similar groups before and after policy in control states. LPM indicates linear probability model for binary outcomes; Control states are based on the same criteria as before and include Maryland, Minnesota, Illinois and Michigan. All models include controls for demographic and family characteristics –age, age squared, race and ethnicity, education, marital status, number of children, along with labor force status, family income, year of survey, month of survey, state of residence and state-specific linear time trends. Models on the all women sample additionally include a control for labor force status

Table 3 looks at anticipatory effects before birth as well as possible lingering effects after the first year. I find evidence of a positive effect on the subjective well-being of employed women with toddlers, indicating a possible lagged effect of the policy on life satisfaction. This could happen for a number of reasons –adjustments to new parenthood, return to work and readjustment to becoming a new working parent, could all be more stressful in the initial period and the benefits of longer or more affordable leaves may not be immediately noticeable. However, as New Jersey mothers get more settled in their new roles, balancing work and parenting, the positive benefits of paid leave on health, mental health and economic security, could be translating into gains in subjective well-being for them, compared to mothers of toddlers in states who would not have had a similar benefit in the first year of birth. Further, prior research from California also indicates the possibility of increases to work hours and wages after the first

year (Rossin-Slater et al 2013) and such consequences might also explain positive effects on the life satisfaction of mothers of toddlers.

Table 3 Regression coefficients showing estimated effects of the New Jersey paid family leave insurance policy (July, 2009) on women's subjective well-being in the 25-44 age group, before birth, in the first year of birth and after the first year of birth

	Parent of Infant		Parent of Toddler		Pregnant	
	All	**Employed**	**All**	**Employed**	**All**	**Employed**
Treat*Post*NJ	-0.003	0.092	0.046	0.135*	0.052	0.085
	(0.038)	(0.052)	(0.040)	(0.037)	(0.061)	(0.038)
Observations	11,422	7,238	12,996	8,137	11,137	7,176
Pre Policy Mean	0.591	0.618	0.541	0.506	0.597	0.604
	(0.028)	(0.037)	(0.019)	(0.026)	(0.028)	(0.035)

Notes Robust standard errors clustered at the state level in parentheses; *** p<0.001, ** p<0.01, * p<0.05; Each coefficient is a DDD coefficient from a separate linear probability model comparing NJ mothers of infants/toddlers/pregnant women to NJ mothers of older children before and after the policy change with similar groups before and after policy in control states. Control states, based on the same criteria as before, include Maryland, Minnesota, Illinois and Michigan. All models include demographic and family controls –age, age squared, race and ethnicity, education, marital status, number of children, family income, along with year of survey, month of survey, state of residence, and state-specific linear time trends. Models on the all women sample additionally include a control for labor force status.

Tables 4-6 present estimated effects by key subgroups. For married women, I do not find any significant effect on women's overall life satisfaction, whereas for employed unmarried women, I find evidence of a significant positive effect of the policy on subjective well-being. For both groups, the policy seems to have had a significant positive effect on physical health. The well-being difference between married and unmarried women appears to be related to differences in emotional health and the adequacy of social and emotional support. Married women for instance, report an increase of 1-2 days experiencing stress, depression or emotional problems from pre-policy levels, whereas unmarried women, particularly unmarried employed women, report close to 3 days' reduction in the number of days experiencing stress, depression or emotional problems. Unmarried women are also more likely to feel adequate social and emotional support in the post-policy period, while married women are less likely to feel the same.
Table 5 presents results separated into two broad educational levels –bachelor's degree or above and less than bachelor's degree; the latter category includes those with less than a high school diploma, those with a high school diploma and those with some college but not a bachelor's degree. For overall life satisfaction, I find no significant effect on either group. Again, for both groups, I find significant improvements in physical health, with the policy effect stronger for the less educated women. There is a difference in how the policy appears to have affected the daily experience of stress, depression or emotional problems in the two educational groups, such that the more educated women experience an

increase in the frequency of such experiences whereas the less educated women, especially those who are employed, experience a decline in the frequency of such experiences.

Examining results by family income (Table 6), I once more find that other than the employed women in the lowest income category, for all subgroups, there is evidence of a significant improvement in physical health after policy implementation. Other than physical health, most of the positive benefits of the policy seem to be concentrated among women in the lower-middle or middle income families. Of note, in families with annual income in the $25,000 to less than $50,000 category, women see significant positive effects on life satisfaction and in families with annual income $50,000 to less than $75,000, women see improvements in general health status. Further, the policy appears to have helped reduce emotional problems and stress for employed women in the lowest income group.

Table 4 Regression coefficients showing estimated effects of the New Jersey paid family leave insurance policy (July, 2009) on women's subjective well-being in the 25-44 age group, by marital status

	Very satisfied with life (LPM)		Very good or excellent self-reported health (LPM)		No. of days last month experienced stress, depression or emotional problems		No. of days last month physical health not good		Usually or always have adequate emotional and social support (LPM)	
	All	**Employed**	**All**	**Employed**	**All**	**Employed**	**All**	**Employed**	**All**	**Employed**
Married	-0.041	0.054	0.027	0.023	1.122***	2.177***	-0.482	-1.094*	-0.038**	0.040
	(0.027)	(0.054)	(0.030)	(0.024)	(0.144)	(0.244)	(0.315)	(0.339)	(0.009)	(0.034)
Obs.	8,193	4,927	10,021	6,082	9,942	6,045	9,952	6,043	8,190	4,925
Not Married	0.107	0.193*	0.015	0.013	-0.920	-2.835+	-2.177*	-2.236	0.074+	0.137
	(0.084)	(0.070)	(0.091)	(0.088)	(0.836)	(1.263)	(0.697)	(1.321)	(0.031)	(0.082)
Obs.	3,229	2,311	4,064	2,883	4,028	2,859	4,025	2,868	3,225	2,309

Notes Robust standard errors clustered at the state level in parentheses; *** p<0.001, ** p<0.01, * p<0.05, + p<0.1; Each coefficient is a DDD coefficient from a separate linear regression model comparing NJ mothers of infants to NJ mothers of older children before and after the policy change with similar groups before and after policy, in control states. LPM indicates linear probability model for binary outcomes; Control states are based on the same criteria as before and include Maryland, Minnesota, Illinois and Michigan. All models include controls for demographic and family characteristics –age, age squared, race and ethnicity, education, number of children, family income, year of survey, month of survey, state of residence and state-specific linear time trends. Models on the all women sample additionally include a control for labor force status.

Table 5 Regression coefficients showing estimated effects of the New Jersey paid family leave insurance policy (July, 2009) on women's subjective well-being in the 25-44 years age group, by education

	Very satisfied with life		Very good or excellent self-reported health		No. of days last month experienced stress, depression or emotional problems		No. of days last month physical health not good		Usually or always have adequate emotional and social support	
	All	**Employed**	**All**	**Employed**	**All**	**Employed**	**All**	**Employed**	**All**	**Employed**
Less than	-0.103	-0.000	0.026	0.049	-0.478	-2.140+	-1.670**	-2.339*	0.005	0.149
Bachelor's	(0.062)	(0.087)	(0.079)	(0.081)	(0.390)	(1.050)	(0.399)	(0.880)	(0.037)	(0.074)
Obs.	6,227	3,734	7,566	4,507	7,489	4,466	7,491	4,478	6,223	3,731
Bachelor's degree	0.074	0.131	0.023	0.013	1.312**	2.430***	-0.261	-0.978*	-0.018	0.019
	(0.045)	(0.072)	(0.019)	(0.016)	(0.256)	(0.223)	(0.325)	(0.334)	(0.018)	(0.018)
Obs.	5,195	3,504	6,519	4,458	6,481	4,438	6,486	4,433	5,192	3,503

Notes Robust standard errors clustered at the state level in parentheses; *** p<0.001, ** p<0.01, * p<0.05, + p<0.1; Each coefficient is a DDD coefficient from a separate linear regression model comparing NJ mothers of infants to NJ mothers of older children before and after the policy change with similar groups before and after policy, in control states. LPM indicates linear probability model for binary outcomes; Control states are based on the same criteria as before and include Maryland, Minnesota, Illinois and Michigan. All models include controls for demographic and family characteristics –age, age squared, race and ethnicity, marital status, number of children, family income, year of survey, month of survey, state of residence and state-specific linear time trends. Models on the all women sample additionally include a control for labor force status.

Table 6 Regression coefficients showing estimated effects of the New Jersey paid family leave insurance policy (July, 2009) on women's subjective well-being in the 25-44 years age group, by family income

	Very satisfied with life		Very good or excellent self-reported health		No. of days last month experienced stress, depression or emotional problems		No. of days last month physical health not good		Usually or always have adequate emotional and social support	
	All	**Employed**	**All**	**Employed**	**All**	**Employed**	**All**	**Employed**	**All**	**Employed**
<25,000	-0.101	0.009	0.040	0.037	-2.083	-4.926+	-1.737*	1.181	0.000	-0.051
	(0.142)	(0.142)	(0.033)	(0.161)	(1.199)	(2.008)	(0.664)	(1.509)	(0.098)	(0.132)
Obs.	1,824	957	2,367	1,229	2,338	1,214	2,328	1,215	1,823	957
25,000 to <50,000	0.322**	0.571**	-0.044	-0.024	1.471	3.980*	-0.298	-1.980*	0.124*	0.258*
	(0.072)	(0.118)	(0.098)	(0.154)	(0.871)	(1.216)	(0.608)	(0.744)	(0.041)	(0.070)
Obs.	2,355	1,528	2,794	1,819	2,767	1,804	2,779	1,809	2,352	1,526
50,000 to <75,000	0.079	0.033	0.261***	0.296**	0.632	0.766	-2.490**	-3.014**	0.185**	0.130**
	(0.094)	(0.184)	(0.031)	(0.051)	(1.133)	(1.039)	(0.593)	(0.608)	(0.031)	(0.024)
Obs.	2,010	1,380	2,384	1,645	2,374	1,641	2,379	1,645	2,010	1,380
>75,000	-0.069	-0.021	-0.022	-0.013	0.775**	1.770**	-0.524*	-1.343*	-0.051	-0.002
	(0.047)	(0.069)	(0.036)	(0.053)	(0.171)	(0.296)	(0.136)	(0.388)	(0.035)	(0.045)
Obs.	4,496	3,021	5,625	3,831	5,589	3,808	5,594	3,809	4,494	3,019

Notes Robust standard errors clustered at the state level in parentheses; *** p<0.001, ** p<0.01, * p<0.05, + p<0.1; Each coefficient is a DDD coefficient from a separate linear regression model comparing NJ mothers of infants to NJ mothers of older children before and after the policy change with similar groups before and after policy, in control states. LPM indicates linear probability model for binary outcomes; Control states are based on the same criteria as before and include Maryland, Minnesota, Illinois and Michigan. All models include controls for demographic and family characteristics –age, age squared, race and ethnicity, education, marital status, number of children, year of survey, month of survey, state of residence and state-specific linear time trends. Models on the all women sample additionally include a control for labor force status.

4.3 Supplementary Analyses

I conduct several sensitivity and robustness checks. First, I examine whether the key findings are sensitive to the choice of control states (Table B1). Comparing between the main group of control states – those with similar aggregate subjective well-being – and two alternate sets of control states selected on the basis of similar social and economic status of women or similar work and family environments, I find the overall finding of a small to negligible statistically insignificant policy effect to be consistent in both the full sample and the prime working age sample and the result of a positive although statistically insignificant effect in the employed sample. This improves confidence on the main findings. Second, I test sensitivity of the results to the choice of comparison groups (Table B2) by varying the age range of children whose mothers form the key control group. Results remain consistent with prior findings.[23]

5. Discussion

This study set out to examine the effects of a policy change in New Jersey in 2009 that was introduced to ensure paid benefits for workers going on leave for childbirth, adoption or other family related medical emergencies, on women's subjective well-being –a global evaluation of life, all things considered, or life satisfaction. Using pooled data from a large, nationally representative cross-sectional panel over the 2005-2012 period and difference in difference research designs, I do not find evidence of any significant effect of this policy change on women's life satisfaction. This result is consistent with the findings from aggregate cross-national research that finds no effects of parental leave policies on subjective well-being (Pezzini 2005) but differs from country-specific analyses for Germany and UK (d'Addio et al 2014) that find strong positive effects. I do however find evidence of improvements in women's physical health after the policy implementation. Given that one of the key objectives of parental leave policy is to help women recover physically from childbirth, the increase in the right to paid leave after implementation of the NJ PFL could certainly have had a role in this improvement.

I further find variation in effects in disaggregated analyses, with significant positive effects on the life satisfaction of employed single mothers and women from lower-middle income families, as well as significant improvements in the experience of stress, depression and emotional problems for single mothers, mothers with less than a bachelor's degree and mothers from low income families. This heterogeneity of effects, with noticeable gains to relatively disadvantaged groups, is consistent with prior research that finds unpaid policies to be primarily utilized by relatively advantaged groups and paid policies (or increases in cash benefits) to induce relatively larger increases in leave taking as well as second order well-being effects for traditionally disadvantaged groups (Cantor et al 2001; Klerman et al 2013; Rossin-Slater et al 2013; Han et al 2009; Kerr 2016; Abade et al 2015; Carneiro et al 2010).

I consider four possibilities that might explain the overall null effect on life satisfaction in my study. First, mechanisms that would theoretically predict positive effects and those that would theoretically predict negative effects on women's subjective well-being, could be canceling each other out; results from analyses of alternative self-reported outcomes and potential mechanisms are consistent with this possibility. Second, heterogeneity of policy effects across different subgroups of the population could be canceling each other out to produce overall no effects; results from subgroup analyses provide some evidence supporting this possibility. Thirdly, I consider the possibility that state level paid family leave policies, as they stand now, are inadequate for producing significant measurable effects on people's quality of life. Prior research provides compelling evidence of their take-up in the US, but also finds large gaps in awareness of such policies, indicating a possible lag effect that might explain my results. And finally, I consider the opposite scenario that the policies *are* affecting women's well-being but due to limitations of data and research design, the study is unable to empirically identify these effects. Supplementary analyses address some, though not all, of these concerns, and in general tend to indicate a bias towards zero. I explore these four possibilities in detail below and conclude with some thoughts regarding potential implications for policy and research.

Are positive and negative effects of the policy canceling each other out?

A positive well-being effect may be explained through the health mechanism since PFL appears to significantly improve women's physical health condition after policy implementation. This result is likely directly related to the increased affordability of leave after policy implementation, which in turn would allow mothers a longer period of recovery post birth as well as less stressful breastfeeding experiences. On the other hand, the policy appears to have significantly increased the frequency with which new mothers experience stress, depression or emotional problems. While the policy improves affordability of leave, the duration of job protected leave is limited to 12 weeks (for those covered by FMLA), and the duration of paid leave to 6 weeks; meanwhile, early maternal employment has been associated with elevated depressive symptoms and parenting stress as well as worse self-rated health, in the first year of birth (Chatterji, Markowitz & Brooks-Gunn, 2013) and might explain the increases in stress, depression and emotional problems that I observe.

The opposite influences of these potential mechanisms could explain the overall negligible effect on well-being. Of course, the above are only some of the observed outcomes whereas, key experiences after childbirth such as caring for the newborn and bonding as a family, experiences dealing with economic insecurity and return to work, all likely play an important role in the overall life satisfaction in the first year of birth. I draw upon theory to explain some of the other potential mechanisms likely at play here.

Since the PFL is primarily meant to make leave taking more affordable for new parents, it follows directly that it would improve new mothers' economic security, which in turn should have positive consequences for overall life satisfaction. However, I consider how the income mechanism might also produce negative well-being effects, by drawing upon the utilitarian perspective on subjective well-being (Layard, 1980). Scholars have argued that satisfaction depends on status and income relative to the expectation. Since women are more likely to be comparing their income during the leave period relative to their past income and not to the hypothetical zero income that they would have experienced had there been no PFL in place, they might experience an overall negative effect on life satisfaction. Moreover, marginal utility of income for decreases in income (to a level below expected income) is theoretically determined to be much greater than the marginal utility for increases in income (Layard, 1980). This idea is akin to "loss aversion" (Hirschauer et al 2015, Kahneman and Tversky 1991) and therefore, the loss to well-being from the income lost in the period of leave would trump any gains to utility from PFL benefits received, since the policy only provides 50-55% wage replacement. The resultant net effect on satisfaction would then be negative. To the extent that both positive and negative effects are in play, the overall observed effect on women's subjective well-being may appear insignificant.

Heterogeneity of well-being effects

Results also point to heterogeneity of well-being effects by demographic and socio-economic subgroup, with particularly strong positive consequences for life satisfaction, emotional welllbeing, general health and/or availability of social and emotional support for women in lower and middle income families. Related research shows persistent differences in leave coverage and leave taking across the family income distribution in the US that are not affected by unpaid leave policies (Kerr 2016). Since over 50% of people covered under FMLA list "unable to afford" as the top reason for not taking family leave despite needing it (Klerman et al 2013), it follows that introduction of PFL will likely improve the overall well-being of new mothers who are less likely to be economically secure and/or less likely to have access to alternate support systems whether from the state or from within the family. On the other hand, there is evidence of increased immunizations for lower income groups after passage of paid family leave (Abeda et al 2015).

In section 1, I have discussed a number of different ways in which introduction of paid parental leave policies might have a negative effect on subjective well-being of new mothers. Here I revisit a few of these factors that are likely relevant for the subgroups for whom I observe increases in stress, depression or emotional problems after the policy, i.e. married mothers, highly educated mothers, mothers from high income families , all of the relatively advantaged groups. For married mothers, scholars' concern about the likelihood that parental leave policies will perpetuate or induce a more gendered division of care work

within the family (Bergman 1997, 2008), may become a reality, negatively affecting their emotional health. While there is growing evidence about such policies increasing fathers' leave-taking as well as joint leave-taking (Bartel et al 2015), whether or how they affect gendered norms within households, is less known. For highly educated women (and to the extent that the highly educated women are the same as those belonging to high income families), implementation of a paid family leave policy might create expectations of negative career consequences such as occupational segregation or lowered chances of attaining managerial positions as well as fears of being "mommy-tracked" (Mandel and Semyonov 2005, 2006; Shalev 2008) and could explain the increase in associated stress.

Once again, the variation in effects for different subgroups of the population might cancel each other out and produce overall null effects of the policy change on women's subjective well-being.

Do the policies not have any observable effects on women's well-being?

While they are good beginnings, the state level PFL policies as they stand now are quite weak compared to international norms and do not meet international labor standards (ILO 2014). NJ provides partial wage replacement for 6 weeks and so, it is quite possible that its policy would make little dent in people's lives and well-being. As a comparison, all advanced economies provide at least 14 weeks of paid parental leave, so even though the policy developments are important in the US context, their provisions are quite meagre. Prior research does provide compelling causal evidence of CA PFL having an effect on leave-taking (Baum and Ruhm 2016, Rossin-Slater et al 2013) but the increases are of three to five weeks in magnitude, which may not be enough for meaningful second order effects on overall well-being quality of life or life satisfaction.

Lack of policy effects on subjective well-being could be also be tied to the lack of awareness of such a policy. A survey of over 900 randomly selected registered NJ voters conducted in 2012 revealed substantial gaps in awareness of the paid family leave policy, with 60% of respondents reporting not having any awareness of the policy. Further, lack of awareness was most common among relatively disadvantaged groups such as non-whites, non-married and people with less than $50,000 annual earnings (Houser and White 2012). Awareness of the policy also varies by demographic characteristics, increasing with family income such that about 34% of respondents in the lower middle income groups were aware of it, compared to close to 50% in the upper income families.

Are policy effects not identified due to limitations of data and research design?

Three key concerns are addressed here. Firstly, paid family leave policies assure wage replacement during the period of leave, but have nothing to do with job protection (State of California Employment Development Department, New Jersey Department of Labor), which falls under the federal

FMLA or CFRA (California Family Rights Act) or NJFMLA (New Jersey's modified family leave policy) [24]. Therefore, the introduction of PFL does not affect the coverage limitations of FMLA, CFRA or NJFMLA. It only affects their affordability among already covered workers. Therefore, not restricting the analysis to this latter group likely dilutes the true effect of the policy. In order to assess the potential direction of bias this issue causes, I try alternate exclusion criteria in supplementary analysis. Since the job-protection policies mandate continuing health insurance coverage by the employers during the period of leave, I limit my analysis sample to only employed women and exclude women with no health insurance coverage at the time of the survey, since them not having health insurance would imply they are not covered under FMLA or NJFMLA.

Secondly, following prior research, I have used state of residence to identify likely treated women, whereas, the policies pertain to the state of employment. This is particularly relevant for New Jersey, since 14% of workers residing in New Jersey, work in other states while 8% of New Jersey's workers, commute from out of state (Mckenzie 2013). I considered using commuting patterns both for New Jersey and for surrounding states, New York and Pennsylvania, to better identify the likely treated women, but the gains to identification might be eclipsed by the likely introduction of selection bias since (as a sub-field of urban economics and subjective well-being research has consistently found), commuting has a negative relationship with subjective well-being (Stutzer and Frey 2005; Dolan, Peasgood and White 2008). Nevertheless, I try a rough modification where I exclude the top three labor exporting (to other states) counties of New Jersey. Excluding the uninsured or residents of the top three commuter counties (with workers daily commuting to New York or Pennsylvania), does not induce an appreciable difference on the coefficients.

Finally, none of the within state control groups are completely insulated from the policy effects since the PFL can be taken for other family members as well and for the post baby boom cohort, women with children under 18 are also likely to have adult family members, primarily own parents, requiring care. Therefore, women with infants and women without infants are both likely affected so the limitations of within-state control groups might affect identification of the true difference in well-being between these groups. Most of these limitations would predict that estimated effects would be biased towards zero.

Implications for Policy and Research

Findings of this study have important implications for the evidence base regarding US state family leave policies. Firstly, while prior research has established important gains to child health as a consequence of US state paid parental leave policies, this study provides evidence of gains to maternal physical health, further strengthening the maternal and child health argument for paid family leave

policies. Secondly, this study once again highlights the drawbacks of US work-family policies, compared to international norms as well as international labor standards. Compared to studies that have examined substantially more generous family leave policies and found significant positive effects on women's overall subjective well-being, this study finds no significant life satisfaction effects in case of policies that provide only 6 weeks of paid leave and at a partial wage replacement rate. Prior research has found heterogeneity of effects of parental leave policies depending on the design of that policy – for instance, paid leaves shorter than 6 months are usually associated with positive employment and wage effects, while longer leaves have been found to have adverse consequences for women's employment as well as wages. Similarly, if raising overall quality of life for women and families is a goal of family leave policies, then evidence from this study suggests that such policies would need to be made substantially more generous for noticeable effects on subjective well-being. Thirdly, this study confirms prior findings from California and New Jersey that relatively disadvantaged groups such as single mothers and lower to middle income mothers tend to see significant positive well-being consequences of paid parental leave policies, thereby also highlighting the inequities of unpaid leave policies, which remain the reality for most of the country. And fourthly, this study raises the possibility that the same policy might have negative consequences for relatively advantaged groups such as highly educated, high income, and married mothers, since increased stress, depression and emotional problems are observed for such groups after policy implementation. While I speculate, using prior research and theory, that these negative emotional and mental health effects may be a result of expected negative career consequences and/or regressive gendered divisions of care within the family, substantially more research needs to be conducted to confirm these results and to gauge their underlying mechanisms. It is also possible that these differential consequences by skill and status imply the need for more nuanced leave policies instead of policies that attempt to cater to all kinds of women.

After decades-long inertia in the United States, a number of important developments in work-family policy, particularly with regard to paid family leave, has taken place in quick succession over the past couple of years, with relevant bills in several state assemblies, highly publicized new policies by large employers, and paid family leave making its way into a prominent issue in electoral debate. On April 1, 2016, the state of New York passed a paid family policy that would become effective as of January 1, 2018 and will provide 12 weeks of paid parental leave at 67% wage replacement when fully phased in by 2021. Future research should track the implementation and effects of these new policy developments and through comparative analysis, attempt to find the optimal policy.

References

Adema, W., C. Clarke and V. Frey (2015), "Paid Parental Leave: Lessons from OECD Countries and Selected U.S. States", *OECD Social, Employment and Migration Working Papers*, No. 172, OECD Publishing, Paris. http://dx.doi.org/10.1787/5jrqgvqqb4vb-en

Ai, Chunrong, and Edward C. Norton. "Interaction terms in logit and probit models." *Economics letters* 80.1 (2003): 123-129.

Akgunduz, Yusuf Emre, and Janneke Plantenga. (2012)."Labour market effects of parental leave in Europe." *Cambridge Journal of Economics*

Appelbaum, Eileen, and Ruth Milkman. "Leaves that pay: Employer and worker experiences with paid family leave in California." *EPRN* (2015).

Baker, Michael, and Kevin Milligan. (2008) "Maternal employment, breastfeeding, and health: Evidence from maternity leave mandates." *Journal of Health Economics* 27.4 871-887.

Bartel, Ann, Charles Baum, Maya Rossin-Slater, Christopher Ruhm and Jane Waldfogel (2014, June). *California's Paid FamilyLeave Law: Lessons from the First Decade*. U.S. Department of Labor Publication

Bartel, Ann, Maya Rossin-Slater, Christopher Ruhm, Jenna Stearns, and Jane Waldfogel (2015) *Paid FamilyLeave, Fathers' Leave-Taking, and Leave-Sharing in Dual-Earner Households*. No. w21747. National Bureau of Economic Research

Baum, Charles L. and Christopher J. Ruhm (2016) "The Effects of Paid FamilyLeave in California on Labor Market Outcomes", Journal of Policy Analysis and Management 35No. 2 :333-356

Becker, Gary. S. .1985. "Human Capital, Effort, and the Sexual Division of Labor". *Journal of Labor Economics* S33-S58.

Becker, Gary. S. 1981. *A Treatise on the Family*. Harvard University Press.

Benjamin, Daniel J., Ori Heffetz, Miles S. Kimball, and Alex Rees-Jones. 2012. "What Do You Think Would Make You Happier? What Do You Think You Would Choose?" *American Economic Review* 102 (5): 2083–110.

Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan. "How much should we trust differences-in-differences estimates?." *The Quarterly journal of economics* 119, no. 1 (2004): 249-275.

Blau, Francine D. 1998. "Trends in the Well-being of American Women, 1970-1995," *Journal of Economic Literatur*e, American Economic Association, vol. 36(1), pages 112-165, March.

Brewer, Mike, Thomas F. Crossley, and Robert Joyce. "Inference with Difference-in-Differences Revisited." *IZA* Working Paper (2013).

Brodeur, Abel and Marie Connolly (2013), "Do Higher Child Care Subsidies Improve Parental Well-being? Evidence from Quebec's FamilyPolicies," *Journal of Economic Behavior and Organization* 93 (2013): 1—16, September 2013.

Bureau of Labor Statistics Employee Benefits Survey, "Holiday, Vacation, Sick and Other Leave Benefits, March 2011, data tables 33 for Private, and State and Local Government; http://www.bls.gov/ncs/ebs/benefits/2011/benefits_leave.htm

Cantor, D., Waldfogel, J., Kerwin, J., Wright, M. M., Levin, K., Rauch, J., Hagerty, T. & Kudela, M. S. (2001). Balancing the needs of families and employers: Familyand medical leave surveys. Rockville, MD: Westat.

Carneiro, Pedro, Katrine V. Loken, and Kjell G. Salvanes. (2011) *A flying start? Maternity leave benefits and long run outcomes of children*. No. 5793. IZA Discussion paper series..
Chapple, Simon, Anna D'Addio, and Andreas Hoherz. (2010) *Does Birth-Related Leave Make German Mothers More Satisfied?* Social Policy Division, DELSA, OECD.
Chatterji, Pinka, and Sara Markowitz. (2005) "Does the Length of Maternity Leave Affect Maternal Health?." *Southern Economic Journal*: 16-41.
Chatterji, Pinka, and Sara Markowitz. (2012)"Family leave after childbirth and the mental health of new mothers." *Journal of Mental Health Policy and Economics* 15, no. 2: 61.
Chatterji, Pinka, Sara Markowitz, and Jeanne Brooks-Gunn. (2013) "Effects of early maternal employment on maternal health and well-being." *Journal of population economics* 26, no. 1: 285-301.
D'Addio, Anna Cristina, *et al.* (2014), "Using a quasi-natural experiment to identify the effects of birth-related leave policies on subjective well-being in Europe", *OECD Journal: Economic Studies*, Vol. 2013/1. http://dx.doi.org/10.1787/eco_studies-2013-5k3tvtg6fvmq
Deaton, Angus, and Arthur A. Stone. "Two happiness puzzles." *The American economic review* 103, no. 3 (2013): 591.
Galtry, Judith, and Paul Callister. (2005) "Assessing the Optimal Length of Parental Leave for Child and Parental Well-being How Can Research Inform Policy?." *Journal of FamilyIssues* 26, no. 2: 219-246.
Gault, Barbara, Heidi Hartmann, Ariane Hegewisch, Jessica Milli, & Lindsey Reichlin (2014) *Paid Parental Leave in the United States –What the data tell us about access, usage, and economic and health benefits.* Institute for Women's Policy Research.
Goodman, Julia. "Did California's Paid Family Leave Law Affect Mothers' Time Spent on Work and Childcare." *Unpublished manuscript. UC Berkeley, Berkeley, California* (2014).
Han, Wen-Jui, and Jane Waldfogel. (2003) "Parental leave: The impact of recent legislation on parents' leave taking." *Demography* 40.1: 191-200.
Han, Wen-Jui, Christopher Ruhm, and Jane Waldfogel. (2009) "Parental leave policies and parents' employment and leave-taking." *Journal of Policy Analysis and Management* 28.1: 29-54.
Herbst, Chris M. "Welfare reform and the subjective well-being of single mothers." *Journal of Population Economics* 26, no. 1 (2013): 203-238.
Hofferth, Sandra, Sarah M. Flood, and Matthew Sobek. 2013. American Time Use Survey Data Extract System: Version 2.4 [Machine-readable database]. Maryland Population Research Center, University of Maryland, College Park, Maryland, and Minnesota Population Center, University of Minnesota, Minneapolis, Minnesota. http://www.atusdata.org.
Houser, Linda and Karen White (2012), "Awareness of New Jersey's FamilyLeave Insurance Program Is Low, Even As Public Support Remains High and Need Persists". Center for Women and Work at Rutgers, The State University of New Jersey
International Labour Organization (2014) Addati, Laura, Naomi Cassirer, and Katherine Gilchrist. *Maternity and paternity at work: Law and practice across the world*.
Kerr, Sari Pekkala. "Parental Leave Legislation and Women's Work: A Story of Unequal Opportunities." *Journal of Policy Analysis and Management* 35, no. 1 (2016): 117-144.

Klerman, Jacob Alex, and Arleen Leibowitz. (1997) “Labor supply effects of state maternity leave legislation.” In Blau, Francine D., and Ronald G. Ehrenberg, eds. *Gender and familyissues in the workplace*. Russell Sage.
Klerman, J.A.; Daley, K.; Pozniak A. 2013. Family and medical leave in 2012, Technical Report, prepared for the US Department of Labour (Washington).
Korpi, Walter, Tommy Ferrarini, and Stefan Englund. “Women’s opportunities under different familypolicy constellations: gender, class, and inequality tradeoffs in western countries re-examined.” *Social Politics: International Studies in Gender, State & Society* 20, no. 1 (2013): 1-40.
Lalive, Rafael, and Josef Zweimüller. (2009) “How does parental leave affect fertility and return to work? Evidence from two natural experiments.” *The Quarterly Journal of Economics* 124, no. 3: 1363-1402.
Layard, Richard. 2006. “Happiness and Public Policy: A Challenge to the Profession.” *The Economic Journal*, 116(510): c24–c33.
Layard, Richard. “Measuring subjective well-being.” *Science* 327, no. 5965 (2010): 534-535.
Lerner, Sharon and Eileen Appelbaum (2014) “Business As Usual: New Jersey Employers’ Experiences with FamilyLeave Insurance”, Center for Economic Policy and Research
Mandel, H., & Semyonov, M. (2005). Familypolicies, wage structures, and gender gaps: Sources of earnings inequality in 20 countries. American Sociological Review, 70, 949_967.
Mandel, H., & Semyonov, M. (2006). A welfare state paradox: State interventions and women’s employment opportunities in 22 countries. American Journal of Sociology, 111(6),1910_1949.
McKenzie, Brian. "Out-of-state and long commutes: 2011." *US Department of Commerce Economics and Statistics Administration* (2013).
National Partnership for Women and Families (2015) “First Impressions: Comparing State Paid Family Leave Programs in Their First Years Rhode Island’s First Year of Paid Leave in Perspective”
O’Donnell, Gus, Angus Deaton, Martine Durand, David Halpern, and Richard Layard. “Well-being and policy.” The Commission on Well-being and Policy , *Legatum Institute (2014).*
Pezzini, Silvia. “The Effect of Women’s Rights on Women’s Welfare: Evidence from a Natural Experiment*.” *The Economic Journal* 115, no. 502 (2005): C208-C227.
Puhani, Patrick A. "The treatment effect, the cross difference, and the interaction term in nonlinear “difference-in-differences” models." *Economics Letters* 115, no. 1 (2012): 85-87.
Rasmussen, Astrid Würtz. (2010) “Increasing the length of parents’ birth-related leave: The effect on children’s long-term educational outcomes.” *Labour Economics* 17, no. 1: 91-100.
Robson, A, Samuelson, L (2011) The evolution of decision and experienced utilities. Theoretical Economics 6: pp. 311-339
Rossin-Slater, Maya, Christopher J. Ruhm, and Jane Waldfogel. "The effects of California's paid family leave program on mothers’ leave-taking and subsequent labor market outcomes." *Journal of Policy Analysis and Management* 32, no. 2 (2013): 224-245.

Ruhm,Christopher J. (1998) “The economic consequences of parental leave mandates: Lessons from Europe.” *The quarterly journal of economics* 113, no. 1 285-317.
Ruhm, Christopher J. (2000) “Parental leave and child health.” *Journal of Health Economics* 19.6: 931-960.

Schober, Pia S., and Juliane F. Stahl. "Expansion of Full-Day Childcare and Subjective Well-being of Mothers: Interdependencies with Culture and Resources." *European Sociological Review* (2016)
Shalev, M. (2008). Class divisions among women. Politics & Society, 36, 421_444.
Stiglitz, Joseph E., Amartya Sen, and Jean-Paul Fitoussi. "Report by the commission on the measurement of economic performance and social progress." *Paris: Commission on the Measurement of Economic Performance and Social Progress* (2010).
Stutzer, Alois, and Bruno S. Frey. "Recent advances in the economics of individual subjective well-being." *Social Research* (2010): 679-714.
Tanaka, Sakiko. (2005). "Parental leave and child health across OECD countries". *The Economic Journal* 115(501): F7-F28.
U.S. Census Bureau. (2015). Quarterly Workforce Indicators Data. Longitudinal-Employer Household Dynamics Program. http://www.vrdc.cornell.edu/qwipu/
http://lehd.ces.census.gov/applications/help/led_extraction_tool.html#!what_is_the_led_extraction_tool
Waldfogel, Jane. (1999) "The impact of the Family and Medical Leave Act". *Journal of Policy Analysis and Management*.; 18(2):281–302.
Washbrook, Elizabeth, Christopher J. Ruhm, Jane Waldfogel, and Wen-Jui Han. (2011) "Public policies, women's employment after childbearing, and child well-being." *The BE journal of economic analysis & policy* 11, no. 1.
Würtz-Rasmussen, Astrid. "Increasing the length of parents' birth-related leave: The effect on children's long-term educational outcomes." *Labour Economics* 17, no. 1 (2010): 91-100.

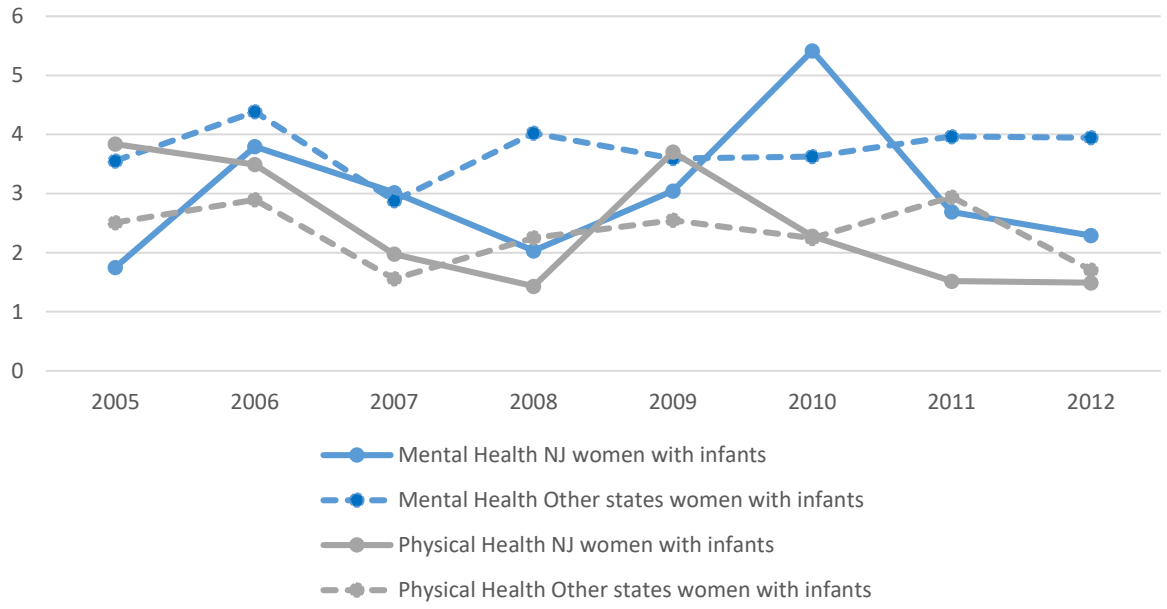
Appendix A. Additional Descriptive Results

Table A1. Coefficients showing regression adjusted mean difference in well-being between women who had a birth before and after the policy change in New Jersey

	Full Sample, 18-65 years			Prime Working Age, 25-44 years			25-44 years and Employed		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
BirthPost	0.084	0.088	0.080	0.085	0.090	0.070	0.099	0.099	0.085
	(0.052)	(0.052)	(0.052)	(0.057)	(0.057)	(0.057)	(0.068)	(0.068)	(0.069)
Obs.	10,197	10,197	10,197	6,566	6,566	6,566	4,120	4,120	4,120
R-squared	0.069	0.073	0.086	0.076	0.082	0.100	0.066	0.066	0.083

Source Behavioral Risk Factor Surveillance System Survey Data. 2005-2012. *Notes* Each of the above coefficients is from a separate linear probability model (equation 3.1 in the text). Robust standard errors in parentheses; *** $p<0.001$, ** $p<0.01$, * $p<0.05$. Each column represents a separate model specification. Model 1 includes controls for demographic and family characteristics –age, age squared, race and ethnicity, education, marital status, number of children, along with year of survey and month of survey; Model 2 additionally includes a control for labor force status and Model 3 additionally includes family income.

Fig A1. Trends for Selected Well-being Outcomes for Women with Infants in New Jersey and in Other States, 2005 - 2012



Source: Behavioral Risk Factor Surveillance System Survey Data. 2005-2012.
Notes Vertical line shows the point when the New Jersey PFL became effective, July 2009. Means are weighted by BRFSS annual survey final sampling weights. Mental Health is measured as the number of days in the past month that the respondent experienced stress, depression or emotional problems; Physical Health is measured as the number of days in the past month that the respondent experienced poor physical health such as injuries and illnesses. Non Policy States include states that are closest to New Jersey in state level subjective well-being in 2005-2008, based on prior research (Oswald and Wu 2010). These control states include Maryland, Minnesota, Illinois, Indiana and Michigan.

Table A2 Descriptive Statistics by Pre and Post Policy for Treatment and Control Groups in New Jersey and Control States in the Behavioral Risk Factor Surveillance System Random Child Selection Modules 2005-2012

BRFSS 2005-2012	Women with Infants		Women with Toddlers		Pregnant Women		Women with older children		Women with no children	
NEW JERSEY	Pre Policy	Post Policy	Pre Policy	Post Policy	Pre Policy	Post Policy	Pre Policy	Post Policy	Pre Policy	Post Policy
Age	31.3 (0.552)	31.4 (0.608)	32.9 (0.380)	32.5 (0.430)	29.2 (0.471)	29.9 (0.558)	38.0 (0.239)	37.9 (0.223)	47.3 (0.251)	47.3 (0.251)
Age Group (%)										
<25	19.3	21.1	15.3	14.4	30.1	16.9	5.9	3.9	9	9
25-44	75	73.2	78.2	79.7	69.9	83.1	76.4	77.3	24.5	24.5
45-54	3.8	3.6	3.6	3.9	0	0	15.1	16.6	27.7	27.7
>54	1.9	2	2.9	2	0	0	2.5	2.2	38.8	38.8
Employment Status (%)										
Employed	56.6	63.3	60	65.3	64.2	68.4	68.5	69.4	73.7	73.7
Unemployed	15.9	15.2	8	10	14	16	7.1	11.2	12.6	12.6
Out of Labor Force	27.5	21.5	32	24.7	21.9	15.7	24.4	19.4	13.7	13.7
FamilyIncome (%)										
Less than 25K	21.4	24	16.7	20	18.4	18	17.3	20.1	14.6	14.6
25K to less than 50K	13.1	12.9	15.8	17.4	16.8	23.1	15.3	17.4	18.3	18.3
50K to less than 75K	14.7	11.7	12.1	8.2	11.5	10.3	13.9	11.3	16	16
75K and above	39.7	39.9	44.7	46.5	43.1	42.1	44	41.7	37.2	37.2
Missing	11.1	11.4	10.6	7.9	10.2	6.4	9.5	9.5	13.9	13.9
Marital Status										
Married	72.7	67.7	74.8	65.8	74.7	70.7	70.8	65.1	52.8	52.8
Previously Married	6.1	3.2	5.2	7.1	2.5	3	12	12.1	18.6	18.6
Never Married	21.2	29.1	20	27.2	22.8	26.4	17.2	22.8	28.6	28.6
Education (%)										
Less than High School	11.3	6.7	7.4	9.7	7.9	7.2	7.5	9.7	5.4	5.4
High School	17.7	20.7	20.2	24	23.3	21.1	22.4	23.5	25.6	25.6
Some College	22.4	25.8	22.4	21	21.7	23.5	25.3	25.3	26.5	26.5
College Graduate	48.7	46.7	49.9	45.3	47.1	48.2	44.8	41.5	42.6	42.6
Race and Ethnicity (%)										
Non-Hispanic White	55.7	50.8	57.1	51.1	58.8	56.8	57.2	53.7	67.2	67.2
Non-Hispanic Black	9.5	12.3	10.4	15.7	11.2	14	12.6	14.9	11	11
Hispanic	25.3	22.1	24	23.8	18.8	20.1	21.6	21.6	12.1	12.1
Others	9.6	14.7	8.6	9.4	11.2	9	8.6	9.8	9.7	9.7
Observations	374	336	828	622	374	264	2,644	2,437	11,311	10,490
CONTROL STATES										
Age	29.9 (0.288)	31.4 (0.443)	30.8 (0.257)	31.8 (0.329)	28.9 (0.258)	29.2 (0.283)	37.0 (0.141)	37.3 (0.189)	47.1 (0.129)	47.8 (0.142)
Age Group (%)										
<25	25	17.1	22.7	17.9	25.4	21.8	5.3	5.1	10.2	9.8
25-44	69.8	76.3	72.3	75.5	74.6	78.2	79.7	80	22.8	21.3
45-54	3.7	4.6	3.6	3.6	0	0	12.2	12.1	30.8	29.7
>54	1.5	2	1.4	3.1	0	0	2.8	2.8	36.2	39.1
Employment Status (%)										
Employed	61.1	66.9	63.5	63.9	65.2	65.8	69.6	68.6	75.6	73.3
Unemployed	8	9.8	10.3	12.3	9.2	14.9	6.6	9.8	6.4	8.8
Out of Labor Force	31	23.3	26.2	23.9	25.7	19.3	23.9	21.6	17.9	17.9
FamilyIncome (%)										

Less than 25K	20.8	22	18	24.7	19.2	25	17.5	21.2	13.8	17.6
25K to less than 50K	23	20.1	24	17.8	22.4	14.9	22.7	18.3	25.5	23.5
50K to less than 75K	17.6	15.4	18.9	12.7	18.7	16.3	19.1	17.3	19.1	17.8
75K and above	30.7	37.3	30.5	36.9	31.4	36.1	34.3	37.4	29.5	30.7
Missing	8	5.2	8.7	7.9	8.3	7.6	6.5	5.8	12.1	10.4
Marital Status										
Married	70.4	71.7	72.1	67.9	72.1	67.8	71.5	70.2	59.2	55.5
Previously Married	6.8	5.1	6.1	6.3	5.8	4.3	12.6	12.3	16.9	17.4
Never Married	22.8	23.2	21.9	25.8	22.1	27.9	15.9	17.5	23.9	27.1
Education (%)										
Less than High School	8.9	3.9	7.4	9.9	9	13.1	5.9	7	4	4.9
High School	22.5	19.7	23.7	17.7	21.1	19.4	25	21.3	28	27
Some College	27	32.2	27.1	29.5	22.3	21.8	30.5	29.9	28.8	32.1
College Graduate	41.7	44.2	41.9	42.9	47.7	45.7	38.5	41.8	39.3	36
Race and Ethnicity (%)										
Non-Hispanic White	73.8	69.6	74.4	68.3	71.3	71.5	71.6	70	79.2	77.6
Non-Hispanic Black	11.7	13.7	11.9	12.9	10.3	9	13.5	14.8	11.4	13.1
Hispanic	7.6	11	7.5	11.6	12.1	10.4	8.7	9.7	4.5	4.1
Others	7	5.7	6.1	7.1	6.3	9.1	6.3	5.5	4.9	5.2
Observations	1,092	573	2,062	1,104	1,049	914	6,766	4,309	33,842	35,568

Notes Means are weighted by BRFSS annual survey final sampling weights. Pre-Policy period includes January, 2005 to June, 2009 and Post-Policy period includes July 2009 to December 2012. Non Policy States include states that are closest to New Jersey in state level subjective well-being, 2005-2008, based on prior research (Oswald and Wu 2010). These control states include Maryland, Minnesota, Illinois, Indiana and Michigan.

Appendix B. Supplementary Analyses

Table B1. Regression Coefficients showing Estimated Effects of State Paid Parental Leave Policies on Women's Subjective Well-being for Alternate Sets of Control States

Control States	Full Sample, 18-65 years	Prime Working Age, 25-44 years	25-44 years and Employed
States with similar aggregate subjective well-being (excluding TDI states)			
	0.008	-0.013	0.075
	(0.024)	(0.037)	(0.052)
	14,922	11,422	7,238
States with similar social and economic status of women			
	-0.002	-0.009	0.042
	(0.029)	(0.024)	(0.059)
	15,312	11,591	7,504
States with similar work and family environment			
	0.024	0.021	-0.010
	(0.051)	(0.035)	(0.066)
	9,211	6,890	4,230
States with similar aggregate subjective well-being (including TDI states)			
	0.024	-0.020	0.078
	(0.022)	(0.034)	(0.044)
	16,814	12,957	8,389

Notes Robust standard errors clustered at the state level in parentheses; *** p<0.001, ** p<0.01, * p<0.05; Each coefficient is a DDD coefficient from a separate linear probability model comparing NJ mothers of infants to NJ mothers of older children before and after the policy change with similar groups before and after policy in control states. Control states in the first panel are as before, states that are closest to NJ in aggregate state level subjective well-being 2005-2008, based on prior research (Oswald and Wu 2010) and include Maryland, Minnesota, Illinois and Michigan in the BRFSS analysis. Control states in the second panel are states with similar social and economic status for women, based on state-wise rankings on women's median earnings, percentage of women in managerial and professional occupations and percentage of women with health insurance, created by the Institute for Women's Policy Research (IWPR) using data from the American Community Survey (ACS) 2009 and 2012. These states include Arkansas, Georgia, Idaho, Illinois, Maine, Maryland, New Hampshire and Virginia; Control states in the third panel are states with similar work and family environment, based on state-wise data on infant care costs, gender difference in parental labor force participation and overall work-family environment, provided by IWPR (2015)and include Arizona, Florida, Nebraska, Oklahoma, Pennsylvania. All models include controls for demographic and family characteristics –age, age squared, race and ethnicity, education, marital status, number of children, along with labor force status, year of survey, month of survey, state of residence and state-specific linear time trends.

Table B2. Regression Coefficients showing Estimated Effects of State Paid Parental Leave Policies on Women's Subjective Well-being for Alternate Sets of Control Groups

	Full Sample, 18-65 years	Prime Working Age, 25-44 years	25-44 years and Employed
Compared to women with 5-12 year olds			
	0.018	-0.003	0.092
	(0.024)	(0.038)	(0.052)
	14,922	11,422	7,238
Compared to women with 3 to 10 year olds			
	0.020	0.005	0.085
	(0.028)	(0.036)	(0.052)
	14,711	11,878	7,281
Compared to women with 3 to 5 year olds			
	0.046	0.048	0.124
	(0.039)	(0.034)	(0.049)
	5,654	4,653	2,712
Compared to women with 10 to 12 year olds			
	0.012	-0.015	0.073
	(0.041)	(0.056)	(0.065)
	5,695	4,085	2,585

Notes Robust standard errors clustered at the state level in parentheses; *** p<0.001, ** p<0.01, * p<0.05; Non – Illinois, Indiana, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, and Washington. Each coefficient is a DDD coefficient from a separate linear probability model comparing NJ mothers of infants to NJ mothers of older children before and after the policy change with similar groups before and after policy in control states. Control states include states that are closest to NJ in aggregate state level subjective well-being 2005-2008, based on prior research (Oswald and Wu 2010) and include Maryland, Minnesota, Illinois and Michigan. All models include controls for demographic and family characteristics –age, age squared, race and ethnicity, education, marital status, number of children, along with labor force status, year of survey, month of survey, state of residence and state-specific linear time trends.

Table B3. Regression Coefficients showing Estimated Effects of State Paid Parental Leave Policies on Women's Subjective Well-being for Alternate Inclusion-Exclusion Criteria

	Full Sample, 18-65 years	Prime Working Age, 25-44 years	25-44 years and Employed
Main Analysis			
	0.008	0.075	-0.013
	(0.024)	(0.052)	(0.037)
Obs.	14,922	11,422	7,238
Pre policy mean	0.551	0.591	0.618
	(0.026)	(0.028)	(0.037)
Excluding respondents with no health insurance			
	0.009	-0.019	0.054
	(0.018)	(0.035)	(0.052)
Obs.	13,130	10,106	6,641
Pre policy mean	0.602	0.639	0.629
	(0.028)	(0.029)	(0.037)
Excluding respondents from high labor export counties of NJ			
	-0.012	-0.012	0.088
	(0.025)	(0.038)	(0.052)
Obs.	14,486	11,081	7,042
Pre policy mean	0.548	0.588	0.625
	(0.027)	(0.029)	(0.038)

Notes Robust standard errors clustered at the state level in parentheses; *** p<0.001, ** p<0.01, * p<0.05, + p<0.1; Each coefficient is a DDD coefficient from a separate linear probability model comparing NJ mothers of infants to NJ mothers of older children before and after the policy change with similar groups before and after policy in control states. Control states are based on the same criteria as before and include Maryland, Minnesota, Illinois and Michigan. All models include controls for demographic and family characteristics –age, age squared, race and ethnicity, education, marital status, number of children, along with labor force status, year of survey, month of survey, state of residence and state-specific linear time trends. High labor export counties include Sussex, Warren and Ocean counties, based on data from the American Community Survey compiled in the table "Residence County to Workplace County Commuting Flows for the United States and Puerto Rico Sorted by Residence Geography: 5-Year ACS, 2009-2013", http://www.census.gov/population/metro/data/other.html and B08007 "Sex of workers by place of work-state and county level" based on 2009 ACS 1 year estimates, created and downloaded from the US Census Bureau American Fact Finder website on 12/01/2015 http://factfinder.census.gov/faces/nav/jsf/pages/download_center.xhtml

Table B4. Falsification Tests

	Full Sample, 18-65 years	Prime Working Age, 25-44 years	25-44 years, Employed
Infant*Post*MD	-0.052	-0.061	-0.134
	(0.025)	(0.043)	(0.050)
Observations	10,825	8,317	5,310
Infant*Post*MI	-0.056	-0.093	-0.047
	(0.029)	(0.043)	(0.064)
Observations	10,825	8,317	5,310

Notes Robust standard errors clustered at the state level in parentheses; *** p<0.001, ** p<0.01, * p<0.05; Each coefficient is a DDD coefficient from a separate linear probability model comparing mothers of infants in the false policy state (MD=Maryland; MI=Michigan) to mothers of older children before and after the policy change with similar groups before and after policy in control states (control states do not include New Jersey). Control states are based on the same criteria as before and include Minnesota, Illinois and Michigan when the policy state is Maryland, and Minnesota, Illinois, Maryland when the policy state is Michigan. All models include controls for demographic and family characteristics –age, age squared, race and ethnicity, education, marital status, number of children, along with labor force status, year of survey, month of survey, state of residence and state-specific linear time trends.

Endnote

[1] In some countries, maternity and paternity leave pertain to the period immediately after child birth or adoption and *parental* leave pertains to the period following maternity/paternity leave. In this paper, parental leave refers to the entire bundle of leaves available to parents immediately after childbirth but not exceeding the first year of birth.

[2] In the US, the only national leave policy, the Family and Medical Leave Act (1994), mandates 12 weeks of unpaid leave and is not universal in coverage.

[3] I use the terms ‘‘quality of life’’ and “well-being” interchangeably to refer to a multi-dimensional state or condition of individuals, families and societies that I assume all social policies are looking to preserve, enhance or improve and use the terms “subjective well-being”, “life satisfaction” and “life evaluation” interchangeably to refer to a cognitive evaluation of the overall state or quality of one’s life. I avoid using the term “happiness” so as to distinguish this meaning (evaluative well-being) from momentary feelings or emotions that the word happiness tends to conjure (hedonic well-being). In recent work, Deaton and Stone (2013) emphasize this distinction because the two measures capture different aspects of the subjective experience and also have differing relationships with other key correlates of well-being such as education, age, and individual income.

[4] A worker only gets paid a fraction of their usual income when on leave, so they lose income every week they are on leave, therefore in order to have more income, they have to give up time at home. Income therefore does not represent the income earned from cash benefits alone, as in that case, in order to receive more income, a worker must take more weeks of leave.

[5] A more detailed discussion of the theoretical relationship between policy and subjective well-being is beyond the scope of this paper, but see technical appendix to the chapter by Layard and

O'Donnell in Helliwell, Layard, and Sachs (2015). For a discussion of the theoretical properties of subjective well-being and how they relate to individual utility and social welfare, see Kahneman, Wakker, & Sarin (1997) Kahneman, & Thaler (2006), Luis and Becker (2007a, b) and Robson and Samuelson (2011).

[6] However, Das and Polacheck (2015) find that the California policy may have also induced increases in unemployment rates. For reviews of the current published and unpublished evidence on state paid family leave insurance programs, see Gault, Hartmann, Hegewisch, Milli and Reichlin (2014), Bartel, Baum, Rossin-Slater, Ruhm and Waldfogel (2014) and Adema, Clarke and Frey (2015).

[7] Researchers in pediatric health, nursing, and related clinical fields, as well as public health, have examined the effects of duration of leave on maternal recovery from child birth, and breast-feeding. This literature is reviewed in detail in Galtry and Callister, 2005, and Zigler, Muenchoy, and Ruhm, 2012, and is not part of the discussion here.

[8] But see also a recent paper by Schober and Stall (2016) with contradictory results for East and West Germany

[9] Finally, this paper is also guided by important insights from prior research examining the determinants of individual subjective well-being and that describing the relationship of parenthood with subjective well-being –this literature is reviewed in Paper 2. For detailed reviews, also see Dolan, Peasgood and White (2008), Hansen (2012) and Nelson, Kushlev and Lyubomrsky (2014).

[10] The BRFSS data collection is done using a core module that all states must implement in all years, a rotating module that all states must implement every other year, and several optional modules that states are allowed to implement as they see fit. Birth information comes from the Random Child Selection (RCS) Module, which selects any one household child and gathers detailed information about him/her including birth month and year and relationship to the respondent. The RCS module has been fielded since 2004, but not in every state in every year. Relevant to my analysis, the sample size for New Jersey for 2007 is significantly smaller than for other years. Since I have data from January 2005 to June 2009 pre policy, this should not be a major problem.

[11] Another relevant measure is adequate rest or sleep, however it is only available for the 2008-2011 period; since the policy change takes place in July 2009, this does not leave an adequate number of pre-policy observations and therefore, I do not use it in the analyses.
[12] So if a woman has a birth in Q3 of 2010, her eligibility is determined by her earnings in Q3, 2009 + Q4, 2009 + Q1, 2010+ Q2, 2010 . I cannot directly observe earnings in the BRFSS data. However using county level quarterly earnings data for New Jersey, for women, in each of four education categories –less than High School, High School, Some College, and College Graduate, from Quarterly Workforce Indicators (QWI) Data from the U.S. Census Bureau (2015), I compute the average weekly earnings for women in each of these four educational statuses in each of the 21 New Jersey counties, in the 24 weeks and the average earnings over the 52 weeks prior to the month of birth. I impute this earning to the women whose birth, county and

employment status I do observe in the BRFSS data. For instance, if a woman with a High School degree is resident in Bergen county and has a birth in May, 2010, I consider her eligible for the PFL if the average weekly earnings for women with a High School degree in Bergen county over Q4, 2009 and Q1, 2010 is 143$ or more and if the average earnings for women with a High School degree in Bergen county over the Q2, Q3, Q4 2009 + Q1 2010 period (i.e. the past 52 weeks) is $7150 or more (standards have changed to 165$ and 8300$ since then).

[13] Child's age is computed as the difference between the interview date and the birth date. Only birth month and year are recorded for the selected household child. In computations of age in months, therefore, a child whose birth month is recorded as January 1995, is assumed to be born on January *1st* 1995, a child whose birth month is recorded as July, 2009, is assumed to be born on July *1st* 2009 and so on. Therefore, most children will receive a computed age that is 1-30 days larger than their true age, potentially putting them in a different age-in-months group than they truly are. In creating the treatment group, this will likely create a small discrepancy but only for observations that *just* miss the cut, i.e. if a child is recorded as being 12 months or just over, then these children could in fact be less than 12 months. I decide to include these observations within the treatment group if the age in months is 2 months or less over 12. Finally, there are 24 observations with negative age in months, most of which are so because the birth year is missing, and are not used in the analysis; however, for 4 of these observations, birth month is recorded as a future month in the same year as the interview. These 4 observations are in 2005, 2006, 2011 and 2012. For the later years, a computed child age in months is also provided in the BRFSS dataset where the negative child age appears to be a legitimate child age for pregnant women who were interviewed a few months before their due date. I assume this to be the case for the remaining 2 negative values from the 2005 and 2006 data and code them as being pregnant.

[14] The main effect of *Post* is omitted since it is collinear with the year and month fixed effects.

[15] In supplementary analysis, I also test for robustness using alternate child age groups for older children

[16] In the nonlinear models, like probit or logit containing an interaction term, Ai and Norton (2003) provide the derivation for the cross difference/derivative. However, Puhani (2012) has recently argued that in the case of a nonlinear difference-in-differences model, the treatment effect, is not simply equal to the cross difference of the observed outcome, but equal to a difference of two cross-differences: the cross difference of the conditional expectation of the observed outcome minus the cross difference of the conditional expectation of the potential outcome without treatment. Puhani suggests that the direction of the treatment effect may be gauged from the sign of the coefficient of the interaction term. See also Karaka-Mandic, Norton and Dowd (2011).

[17] However, doing so may still not address the problem of statistical inference using small numbers of groups such that the probability of rejecting a true null hypothesis might still remain high. Baker and Milligan 2008 and Rossin-Slater, Ruhm and Waldfogel 2013 conduct a further check using a two-step regression framework proposed by Donald and Lang (2007) to address this concern. However, see also Brewer, Crossley and Joyce (2013) who show that the problem

of inference using small number of groups in a DD setting may not be as complicated and may be operationalized by using a cluster-robust variance matrix that is now conveniently implemented in current statistical software.

[18] I exclude other TDI states, such as New York, California, Rhode Island and Hawaii and states with less than 50 observations in the pooled well-being modules sample. However, in supplementary analysis, I also include them in the group of control states to check for sensitivity to the choice of control states.

[19] These indicators were developed by the Institute for Women's Policy Research based on data from the US Census Bureau American Community Survey 2009 and 2012, as part of its "Status of Women in the States" initiative; more information can be found at:
http://www.iwpr.org/initiatives/thestatusofwomenandgirls
The tables used to select control states for this study are available here:
http://www.iwpr.org/initiatives/states/2009-state-by-state-overview
http://www.iwpr.org/initiatives/states/state-by-state-rankings-and-data-on-indicators-of-womens-social-and-economic-status-2012

[20] Specifically, I select the state ranked the same or just above and just below New Jersey in each of the parameters, drawing upon Chapter 3 "Work and Family" of the IWPR (2015) report and its associated dataset, http://statusofwomendata.org. Indicators and the composite work by IWPR from the American Community Survey, Child Care Aware of America 2014 and a prior report by Gault, Hartmann, Hegewisch, Milli and Reichlin (2014).

[21] Regression adjusted mean difference in well-being between women who had a birth in New Jersey after July, 2009 and women who had a birth in New Jersey before July, 2009, also indicate no significant difference in proportion of women reporting being very satisfied (Appendix A, Table A1).

[22] Appendix A also presents descriptive statistics for key characteristics of the treatment and control groups in policy and non-policy states separated into pre and post policy periods

[23] See also Table B3 for results using inclusion exclusion criteria based on health insurance coverage and county of residence and Table B4 for Falsification Tests using Michigan or Maryland as policy states. Neither of these exercises changes the main results meaningfully.
[24] http://www.dfeh.ca.gov/Publications_CFRADefined.htm;
https://lwd.state.nj.us/labor/fli/content/fli_faq.html#39;
http://www.edd.ca.gov/disability/FAQ_PFL_and_FMLA_and_CFRA.htm