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Mothers in the Military: Effect of Maternity Leave Policy on Take-Up

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Abstract

The United States remains the only OECD nation without national paid maternity leave. This paper exploits changes in paid maternity leave offered by one of its largest employers, the U.S. Department of Defense. Since 2015, the U.S. Marine Corps has shifted their maternity leave policy from six to 18 to 12 weeks. Leave expansions increased leave duration while contractions decreased leave taken by active-duty service members. However, the policy changes crowded out other forms of leave: with an increase in maternity leave available, mothers increased use of maternity leave and stopped supplementing with additional annual leave. Though all mothers used the full six weeks of leave in the early period, it is the less advantaged mothers—in the enlisted ranks, first-time, and single mothers—who disproportionately used more of the additional leave than officers, experienced mothers, and married mothers. Pregnant officers, experienced mothers, and single women use less leave than non-pregnant women in the months leading up to birth, but expecting additional post-birth leave did not change average pre-birth leave-taking. Our results highlight the importance of optimally sizing family leave policies and provide evidence that the true cost of such programs may be lower than the raw count of weeks provided by additional maternity leave allowances.

Keywords: maternity leave; female labor supply; military; crowd-out
JEL Codes: J21, J32, J38, J4

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1 Introduction

Nearly all developed countries offer some type of paid maternity or parental leave (Livingston and Thomas 2019). Access to paid family leave (PFL) for most Americans is through their employer and remains limited (NPWF 2021). This paper exploits recent changes in the paid maternity leave policy offered by one of the largest employers in the United States, the Department of Defense (DoD), to estimate the effect of this policy on the leave-taking behavior of mothers.

While our setting examines the U.S. military, our study can also more generally address first-order questions of maternity leave policies: Does expanded paid leave increase women's time away from work, or does it simply crowd out other forms of leave? Which types of mothers are more likely to stay out of work longer? One of the main arguments for paid maternity leave is that it enables mothers to take time off work to recover from childbirth and care for their newborn (Chatterji and Markowitz 2012; Rossin 2011; Staehelin et al. 2007). A significant crowd out of other leaves would indicate there is little actual increased recovery time and parental time with children. Crowd out would also indicate that women can use their other leaves for different purposes rather than saving it for post-pregnancy.

PFL policies generally aim to enhance maternal and child well-being and alleviate tradeoffs between female employment and childbearing (Olivetti and Petrongolo 2017). PFL could potentially address demographic challenges of declining birthrates and growing elderly populations in industrialized countries by incentivizing fertility (Kalwij 2010; Lalive and Zweimüller 2009; Raute 2019).

Conversely, PFL could instead lower women's future labor attachment and prove costly to employers, particularly if there is wide take-up of available leaves. In theory, PFL impose employer costs that could lead to gender discrimination in the labor market, further widening gender gaps (e.g., Glass 2004). Thus, addressing the first-order questions of how much time off new mothers take and which types of mothers take more time off matters for understanding female labor supply and gender gaps.

Prior studies generally show leave-taking increases with the adoption of and expansions to PFL policies (e.g., Bartel et al. 2015; Baum and Ruhm 2016; Kleven et al. 2019; Rossin-Slater et al. 2013). Because maternity policies vary not just in duration, but also eligibility, income replacement rates, and job protections, it is not always clear how and what aspects of maternity leave programs affect maternal leave-taking.

Our study clarifies prior literature in several important ways. First, our unique context exclusively focuses on how varying leave length affects leave usage. Eligibility, benefit amounts, and job protections remained constant while only duration of leave changed. Second, we examine both a leave expansion (from six to 18 weeks) and contraction (from 18 to 12 weeks), giving us two quasi-experiments and allowing us to explore if policy effects are asymmetric. Third, the leave lengths we examine are similar to current U.S. policy considerations, in contrast to more generous non-U.S. policies.

Our empirical design compares PFL and other types of leave taken by mothers who gave birth before and after policy expansions/contractions, relative to leave taken by propensity-score-matched comparisons. By comparing changes in take-up by mothers with similar Marines, we account not just for time-invariant differences but also for time trends in leave-taking, operational tempo, and work demands. We focus on Marines because the Marine Corps consistently tracked leave during the period that leave policies changed. The Marine Corps also offers insight into both enlisted (workers) and officers (managers/supervisors), who, like civilians, may have different degrees of career attachment and organizational commitment. The pool of mothers is also diverse in terms of race/ethnicity, marital status, and number of prior children. This allows us to investigate whether there are disparities in leave-taking across groups, which is not possible if treated groups are more homogeneous.

Our first finding is that mothers almost uniformly used all of the maternity leave under the six-week and 12-week policies. Most mothers also supplemented with additional leave in the year following birth during the six-week policy, relative to non-mothers, indicating that mothers prefer more than six weeks maternity leave.

Second, maternity leave expansions increase take-up of maternity leave, but mothers did not automatically use all leave. In particular, mothers prefer leave immediately following birth rather than flexible leave available several months after birth.

Third, maternity leave crowds out other forms of leave, even in our context with 100% income replacement. With an increase from six to 18 weeks of maternity leave, mothers increased their maternity leave by 11.1 weeks and decreased their annual leave by 1.7 weeks in the following year. The same pattern occurred to a lesser extent during the 12-week policy. Crowd out of other leave plus less than full take-up means mothers did not increase time spent at home by the increased number of weeks allowed.

Fourth, additional leave was taken up disproportionately by mothers who were of lower ranks (with lower earnings, less education, and less career attachment) and were new to motherhood, while single mothers had less leave crowd-out. That lower-ranked women use more leave could be due to their lower incomes if they do not have as many resources for childcare. It also means that policy expansions allowed less-advantaged mothers to spend more time recovering and caring for their newborns. These findings are consistent with the literature on the motherhood penalty; higher-skilled and higher-earning mothers minimized losses in career continuity.

Finally, the policy changes do not affect leave taken towards the end of mothers' pregnancies. Some pregnant women, in particular officers, experienced mothers, and single mothers, tend to "save" annual leave in the months before birth, but these patterns remain largely consistent regardless of how many weeks of maternity leave pregnant women anticipate.

Given these behaviors, our results have implications on the duration of PFL policies being considered in the public sphere. For instance, Congress introduced a bill to increase military maternity leave to 18 weeks and secondary caregiver leave to 12 weeks (Military Times, 2021). The Marine Corps is currently considering a one-year maternity leave policy. Our study suggests there would be less than full take-up of the new leave, and it will be the younger, lower-ranked, less-educated parents who are most likely to increase take-up. Beyond the military, our findings suggest that more-educated high-earning women are likely to take shorter maternity leaves even when they have access to expanded, fully-paid leaves. The military may differ from civilians in certain dimensions (e.g., more physically fit, younger, male-dominated), but the employment environment may provide particular insight into other heavily male-dominated sectors such as law enforcement or engineering. The internal labor market also provides insights into professions such as lawyers or academics with limited lateral entry.

2 Background and Related Literature

Maternity leave and other policies such as job flexibility and unpaid leave predict whether a mother will return to work after childbirth (Glass and Riley 1998; Hofferth 1996; and many others).[1] Motherhood is often highlighted as the moment the gender wage gap widens over the lifecycle (e.g., Gonalons-Pons et al. 2021). Budig and England (2001) estimate a motherhood wage penalty of 7% per child. This motherhood penalty is far higher for high-skilled high-earning white women (Budig and Hodges 2010; England et al. 2016). However, availability and generosity of leave differs substantially by where women live and work.

2.1 Federal PFL Policies

Starting in October 2020 the U.S. federal government offered 12 weeks of PFL for civil servants. For non-federal workers, the only national policy is the 1993 Family and Medical Leave Act (FMLA) that mandates employers grant eligible workers 12 weeks of unpaid job-protected family leave with continued health insurance coverage. Klerman and Leibowitz (1999) estimate that only 60% of full-time working women return to their pre-pregnancy employer under FMLA.

Slightly more than half of U.S. private sector workers are eligible given FMLA firm size and work history requirements (Ruhm 1997). FMLA increased leave-taking by 23% among mothers of children under one year of age (Waldfogel 1999) with maternal leave-taking increasing 13% during the birth month, 16% during the month after birth, and a marginally significant 20% increase two months after birth (Han et al. 2009). Given limited coverage and a lack of effect on eligible men's leave, Han and Waldfogel (2003) conclude that FMLA has limited impact overall.

2.2 State-level PFL

Eight states plus Washington, D.C. have enacted PFL. States pay benefits as a percentage of prior earnings up to a ceiling. State policies vary in duration from four weeks (e.g., Rhode Island) to 12 weeks

[1] For fathers, increased maternity leave could increase flexibility in their own work schedules (since their spouse is at home), improve mental and physical health, and lower family stress.

(e.g., Massachusetts).

Rossin-Slater et al. (2013) show that California's six-week partially-paid policy moved leave-taking from around three weeks up to six or seven weeks for typical new mothers, relative to various control group mothers in other states and mothers of older children in California. Baum and Ruhm (2016) found that leave duration increased by approximately five weeks for mothers and less than one week for fathers under California's policy. Similar to our study, leave-taking particularly increased among mothers who were less advantaged (less educated, unmarried, or nonwhite) (Rossin-Slater et al. 2013). While California mothers were 18 percentage points more likely to use paid leave, there were no positive effects on their long-run labor market outcomes (Bailey et al. 2019).

Baum and Ruhm (2016) is a useful comparison, as it demonstrates the importance of the income effect: mothers took only five of the six weeks with partial income replacement but all six weeks with full income replacement. Following an increase in California's weekly benefit amount, leave duration did not increase, though more women returned to their pre-leave employer (Bana et al. 2020).

2.3 PFL Outside the United States

PFL mandates have longer histories and generally more generous benefits outside the United States. For example, Canadian expansion in job-protected PFL from six months to one year increased leave duration by three months among new mothers (Baker and Milligan 2008). Ruhm (1998) examines impacts of changes in PFL policies in Europe, where six of the nine study countries offered wage replacement rates of at least 80% as of 1993; PFL policies are associated with higher female employment-to-population ratios. Similarly, Germany's 1979 maternity leave expansion from two to six months led mothers to delay their return to work in the first year after childbirth (Guertzgen and Hank 2018). Meanwhile Dahl et al. (2016) studied PFL in Norway using a series of expansions from 18 to 35 weeks with full income replacement. The reforms did not crowd out unpaid leave and parents increased time spent at home instead of at work. More similar to the United States, Australia introduced 18 weeks of paid leave for mothers in 2011 (Kalb 2018). Mothers' leave-taking increased in the first half-year, and the return to work increased in the first year (Broadway et al. 2020; Martin et al. 2015).

While these studies inform American considerations of PFL policies, the international context may not translate to the United States given relatively generous benefits and financing through government revenues, rather than direct employer contributions.

In the absence of state or federal PFL, firms become de facto policymakers, and firms need to know PFL costs to weigh against the benefits. Brenøe et al. (2020) estimate the effect on firms and coworkers when a worker takes PFL in Denmark. They find no measurable effects on firm output, profitability, or survival, with negligible costs on coworkers.

2.4 PFL and Health

Childbirth is a major medical episode with risk of infection, birth complications, postpartum depression, and changes in health behaviors (Bellows-Riecken and Rhodes 2008; Declercq et al. 2014; Hagen et al. 2013; O'Hara and Swain 1996). Maternal and child health may benefit from expanded PFL through increased recovery, bonding, and breastfeeding time (Rossin-Slater and Uniat 2019), and these benefits may be largest for disadvantaged families.

Norway's introduction of paid maternity leave improved mothers' body mass index, blood pressure, pain, mental health, and propensity to exercise and not smoke, with larger benefits for those with complications at delivery and mothers from less-advantaged backgrounds (Butikofer et al. 2018). In the U.S. Army and Air Force, expansion from six to 12 weeks of maternity leave was associated with fewer postpartum depression diagnoses, with possible benefits to mothers' pain and health care utilization (Balser et al. 2020). California's PFL introduction increased breastfeeding by 10–20 percentage points three–nine months post-birth (Huang and Yang 2015). Child health benefits may extend through early elementary school, with lower rates of being overweight, ADHD, and hearing-related problems following the introduction of California's PFL program, particularly for children from less-advantaged backgrounds (Lichtman-Sadot and Bell 2017).

Limited causal research on *pre*natal leave in the weeks before birth finds that it may slightly increase birthweight while decreasing premature birth and infant mortality (Rossin 2011; Stearns 2015).

2.5 United States DoD Context

Almost 1% of the U.S. population is part of an active duty family (Department of Defense 2019). Congress and DoD leadership frequently discuss the importance of increasing female representation in the military, and understanding parental leave policy is one component of making the military more open to females. Thus, patterns in the military are important in their own right, beyond implications for the civilian sector.

Figure 1 lays out the policies we examine. Active-duty service members earn 30 calendar days of annual leave per year. To take a full week of leave, individuals use seven days of leave. In July 2015, the Department of the Navy (DoN, comprised of the Navy and Marine Corps) announced it would increase maternity leave from six weeks to 18 weeks.[2] The new 18-week policy included six weeks of consecutive convalescent leave immediately following hospital discharge and 12 additional weeks that could be taken non-consecutively within the first year following birth. Eligibility was retroactive to mothers of babies born January 1, 2015, or later, meaning that some mothers who had returned to work following their original six weeks of leave were eligible to take 12 additional weeks before their child's first birthday.

In January 2016 the DoD announced a standardization to 12 weeks of consecutive paid maternity leave for all services. For DoN mothers, that reduced leave by six weeks and required the time to be taken consecutively. The policy applied to pregnancies that began (per doctor estimation) on March 3, 2016, or later, which implies birth dates around November 2016.

Marine mothers cannot immediately exit the labor market as their civilian counterparts can. Officers must submit their resignation 9–12 months in advance of the date they request to resign, while enlisted members are obligated to serve up to their contract end dates. Military employment contracts are typically for four or six years of obligated service. Officers and enlisted members may request an administrative separation prior to the end of their contract due to hardship related to pregnancy or childcare, but these are typically even longer administrative processes.

The DoD offers childcare options for the military; most occurs in on-base childcare centers for chil-

[2]Our analysis takes place within broadly expanding parental support in DoD policy; see Estes et al. (2015). Secondary caregiver leave remained constant at 10 days.

dren ages six weeks–five years (GAO 2020). Some childcare centers have waitlists that limit immediate access for infants (Military Times 2020). Childcare limitations may necessitate more leave for parents.

Balser (2020) examines the expansion of paid leave from six to 12 weeks in the U.S. Air Force and Army, finding that military mothers increased take-up by about five of the additional six weeks. The study does not address crowd out, as its main focus is on the policy impacts on employment and promotion.

3 Data and Empirical Approach

3.1 Data

Our data covers the population of active-duty Marines from January 2013 to August 2018. Our primary data are nearly 13 million month-by-individual snapshots of each Marine's leaves, age, gender, race, ethnicity, pay grade, marital status, months of total service, number of children, unit location, occupational codes, education level, and cognitive test scores from the Armed Forces Qualification Test (AFQT) and General Classification Test (GCT). The data also includes exact dependent dates of birth.

3.1.1 Leave Data

We define two leave categories: maternity leave and chargeable leave. The data includes monthly leave used by type (e.g., sick, maternity, annual) for each Marine, as well as duty limitation type (see Data Appendix). We define "maternity leave" as the combination of what was recorded as maternity, sick, permissive temporary additional duty (PTAD), and emergency leave to capture the maximum amount of birth-related leave available to mothers. About 77% of what we call chargeable leave is annual accrued vacation-type leave but also includes leave related to moving duty stations (17%), combat leave (5%), and special leave (less than 1%). An "all leave" variable captures total leave used. For non-mothers, "all leave" is about 9% sick, PTAD, or emergency leave and 91% chargeable leave; for mothers in the year following birth "all leave" is about 80% maternity, sick, PTAD, or emergency leave and 20% chargeable leave.

Most leave is recorded in a centralized system in a straightforward manner (see Data Appendix). Some mothers' leave was not fully recorded. To minimize measurement error, we exclude such women from the main analysis; missing this data is unrelated to other observable characteristics. In supplementary analysis, we impute a "low" estimate using six weeks and a "high" estimate using the maximum leave available to ambiguously-coded women to estimate a range of potential outcomes for the full sample. We call this the imputation sample.

For each observed month, we calculate the leave used in that month and the sum of leave used in the following 12 months for maternity, chargeable, and total leave. We also define "pregnancy leave" as chargeable leave taken in the 0–3 months before the birth month.

3.1.2 Sample Restrictions

We limit our sample to Marines younger than 45 years to capture women of childbearing age. We exclude individuals stationed in a country or U.S. state in which we never observe a female give birth (e.g., Alaska), as these imply a type of assignment that was likely off-limits to pregnant women.[3] We exclude women who add a baby as a dependent, but who do not give birth, as these women do not receive maternity leave (so are not treated) but are also not representative of what would have happened to mothers in the absence of birth (and thus are not a good control).

Because eligibility for the 18- versus 12-week policy was based on date of conception, it is not obvious which policy applies to babies born in November–December 2016. We exclude births in these months. We also differentiate mothers who had returned to work before they received 12 additional weeks of leave in July 2015 from those who had not yet returned. May 2015 births include mothers who may have returned to work by July 2, so we drop May 2015 births.

We retain individual-months only if we can follow their leave for at least 12 months after the birth month, so our last included birth is in August 2017. Supplementary analyses found no significant changes in female retention following changes to leave policy, as expected given contractual barriers to exit (see Appendix Table 7).

[3]The yearly leave calculation includes subsequent leave taken in these locations.

3.2 Methodology

Naïve analyses that examine parental leave cannot be interpreted as causal because certain types of mothers (e.g., more advantaged mothers) may work at firms that provide more leave. To understand how maternity leave policies affect leave take-up, we need external policy changes that apply broadly to many types of workers. The DoD policy change provides exactly the sort of natural experiment that allows us to examine what happens when leave unexpectedly expands for a broad range of workers, while important characteristics like job security, income level, and benefits remain constant.

Our identification strategy follows Marines over time, comparing leave take-up of mothers who gave birth under the six-week policy to mothers who gave birth under more generous policies. In our first-difference approach, we first compare maternity leave take-up of four sorts of birth events: those who gave birth in December 2014 and earlier (who expected and received six weeks of leave), those who gave birth January–mid-May 2015 (who expected to receive six weeks of leave, gave birth, and received 12 additional weeks of leave after returning to work), those who gave birth mid-May 2015–November 2016 (who knew they would get 18 total weeks before returning to work), and those who gave birth December 2016–August 2017 (who knew they would get 12 weeks of leave). We compare each of the more generous policy periods to the early policy, as follows:

$$\begin{aligned} Y_{itjrl} = &\beta_1 UnexpectedExtra12_{it} + \beta_2 ExpectedExtra12_{it} + \beta_3 ExpectedExtra6_{it} + \mu_m \\ &+ \alpha_j + \gamma_r + \delta_l + X_{it}\theta + \varepsilon_{itjrl} \end{aligned} \tag{1}$$

where Y_{itjrl} is the total amount of a given leave category used in the year following a mother's birth event i in month-year t. The first-difference analysis is limited to mothers. The analysis includes month-of-birth (μ_m), military occupational categories (α_j), military rank (γ_r), and unit location (δ_l) fixed effects.[4] The model also includes controls for demographic characteristics in X_{it}, which accounts for age at birth, age-squared, test scores, and indicators for race/ethnicity (Black, Hispanic, or non-Hispanic white); prior number of children; marital status (married, divorced, or single never-married);

[4] See Data Appendix for details.

and education (high school, some college, or college). We cluster robust standard errors by individual to account for women with multiple birth events. The coefficients of interest are β_1, β_2, and β_3, which provide an estimate of how mothers' leave take-up changed relative to the six-week policy.

Our second strategy takes a difference-in-differences (DID) approach. Using a group of otherwise similar individuals who did not give birth as a control, we compare differences between mothers and non-mothers across policy periods, as follows:

$$\begin{aligned} Y_{itjrl} =& \beta_0 Baby_{it} + \beta_1 Baby_{it} * UnexpectedExtra12_t + \beta_2 Baby_{it} * ExpectedExtra12_t \\ &+ \beta_3 Baby_{it} * ExpectedExtra6_t + \tau_t + \alpha_j + \gamma_r + \delta_l + X_{it}\theta + \varepsilon_{itjrl} \end{aligned} \tag{2}$$

The DID strategy accounts for changes in general leave-taking over time using month-year fixed effects τ_t. Then, β_0 provides an estimate of the differences between mothers and non-mothers in the six-week policy period, while β_{1-3} compare whether the mothers had a change in leave take-up beyond any changes observed in their non-mother comparisons. We cluster robust standard errors by individual to account for women with multiple births over time and comparators who are matched to different birth events at multiple times. The model retains fixed effects and control variables X_{it} from Equation 1.

If women expect to have more maternity leave available post-birth, they may feel less need to save leave and could instead increase their chargeable leave usage $before$ birth. We adapt Equation 2 to assess "pregnancy leave" taken 0–3 months before birth, where treatment is based on the expected policy at the end of pregnancy:

$$Y_{itjrl} = \beta_0 Baby_{it} + \beta_1 Baby_{it} * Expect18_t + \beta_2 Baby_{it} * Expect12_t + \tau_t + \alpha_j + \gamma_r + \delta_l + X_{it}\theta + \varepsilon_{itjrl} \tag{3}$$

Women who gave birth in January 2015 could eventually take 18 weeks of leave, but during pregnancy they anticipated six weeks of maternity leave. Thus, women who gave birth in June 2015 and earlier are in the baseline group of mothers who thought they had six weeks of leave during pregnancy.

Women who gave birth in August 2015 could take some of their chargeable leave during pregnancy, knowing that they had 18 weeks of maternity leave following birth. However, they did not have much time to act on the information, so we exclude women who gave birth immediately following the policy announcement. $Expect18_t$ is equal to 1 for births in October 2015–October 2016, again excluding November and December 2016 births due to ambiguity about the policy. $Expect12_t$ is equal to 1 for births in January 2016 and later, as these mothers knew during pregnancy they would have 12 weeks of maternity leave.

3.3 Assumptions and Limitations

We make two main identifying assumptions. First, we assume that, after implementing our DID model, there are no factors other than the policy change affecting maternal leave take-up over the observed time. For instance, perhaps mothers who wanted more leave did not get pregnant until they knew they would have more leave available following the unexpected announcement of the 18-week policy. To confirm that such behaviors do not drive our results, we include a supplementary analysis that focuses on "choice-limited" mothers (and their comparators) who gave birth before March 2016 (see the online appendix). These mothers made the pregnancy decision before they knew the more generous policy was forthcoming. A similar test ensures abortion decisions do not drive results. These results match our main results.

Second, we assume that in the absence of motherhood our comparators serve as a valid counterfactual. Our DID estimates would be biased if there were also systematic changes occurring among non-mothers that affect only non-mothers. We test directly for differential trends between parents and non-parents using a series of event-study type figures. Additionally, we identify several potential comparison groups to ensure that our results hold across various counterfactual choices.

We note that the policy changes are not far apart in time, which could affect the interpretation of the estimates. It may take time for women to feel comfortable taking 18 weeks of leave, and a longer-term follow-up (if the more generous policy had remained in place) might show different results.

3.4 Identifying a Comparison Group

We identify several potential control groups. First, there is some concern that females in general may be affected by maternity policy changes, even if they do not yet have a child. Male Marines who did not have a baby during the study are not affected by this policy and constitute one potential control group. However, male Marines differ in a variety of ways from female Marines, and female Marine behavior may be more similar to Marine mothers' behavior for unobserved and observed reasons. Limiting the comparison to female Marines who do not have a baby results in a comparison group that is much more similar to the new mothers, and female Marines who do not have a baby during our study period constitute another potential control group.

Maternity leave-taking is on a one-year timescale, while we have observations at the monthly level. Further, estimating event studies requires defining a discrete point of comparison. One difficulty in such a strategy is that we are comparing mothers at the point of birth relative to potentially millions of monthly observations of every Marine in the military. To allow for a point-in-time comparison across similar individuals, we use a machine-learning-based matching strategy to identify additional comparison groups who are similar to the new mothers on a variety of characteristics at the particular month of birth. We use this strategy to identify parents who are observably very similar to the mothers. We repeat this exercise for the "imputation" sample and the pre-pregnancy sample.

The matching process begins by using an adaptive ridge least absolute shrinkage and selection operator (LASSO) model with 10-fold validation to predict who will have a baby among the given set of individuals. LASSO models can improve propensity score comparisons in high-dimensional data with a low share of treated observations (Goller et al. 2020). The LASSO models include new mothers as well as either males or females whom we do not observe adding a dependent baby to the home, who are not married to a military member, and who do not have a child under age one in their home.[5] The LASSO model includes all observable characteristics included as X_{it} in Eq. 3 and interactions between each of these variables. We aim to minimize deviance from the binomial prediction to identify a preferred model

[5]We exclude dual military families because sometimes child dependents are only listed on one parent's file. We do not want to inadvertently include a new mother in the control group if the baby was listed under the father.

for each matching group. From this, we predict the probability that a given observation would have a baby in a given month. Appendix Table 7 displays the coefficients included in the resulting LASSO models. Appendix Figure 6 displays the distribution of propensity scores and common support.

We match each birth month-year for a mother to her five nearest neighbors with replacement, with the requirement that all matches are from the same month-year and the same rank group. Weight w_{it} for each potential comparator is $0.2 * m_{it}$, where m_{it} is the number of times an individual i is matched to any mother in month t. Each birth event month for mothers has a weight of 1 for the 2,424 birth events in the main sample.[6] Most matches have $w_{it} = 0.2$. Our results are largely the same across all comparison groups; we display multiple comparisons for transparency.

3.5 Descriptive Statistics

Table 1 reports summary statistics for mothers in both the main (Column 1) and imputed (Column 2) samples, as well as various potential comparison groups. The average mother (observed at the birth event level) in our sample has a GCT score of 103.0 in both the main and the imputed sample, in contrast to an average of 110.2 for all observations of Marines that we never observe having a baby over our study period (p-value of the difference from the main mothers=0.000 when using robust standard errors clustered by individual) or 105.5 for female Marines in general (p-value of difference from mothers=0.000. N is large in Columns 3–4, as each comparator occurs up to 12 times per year over multiple years. Across all other variables, the unmatched samples are quite different from mothers.[7] Together, the variables in Table 1 are jointly statistically significant in predicting who is a mother (p-value=0.000), indicating that the mothers substantially differ from the unmatched samples.

The final three columns use potential matched groups, which instead connect each birth event to five other Marines in the same month-year, in the same rank group, who are similar on observed characteristics. When the main 2,424 observations of births are matched to 12,030 male observations, the male matches are older, are more likely to be Hispanic, and have served longer. The F-statistic on the test

[6] Multiple births (e.g., twins) count as one birth event.

[7] The unmatched sample is 7.8% female in Column 3; by construction other columns are entirely male or female.

of joint significance is smaller than the non-matched sample, though it remains statistically significant (p-value=0.000). Both female matches to the main and imputed samples are observably quite similar, and the variables are not jointly statistically significant. Overall, this points to a fairly observably similar group of individuals in the matched samples, especially for the female matches. Patterns are the same in the pregnancy leave sample (Appendix Table 8).

4 Results

4.1 Leave Take-Up

We begin by examining the first-differences estimate of how policy changes correspond to changes in maternity leave usage. Figure 2 graphically displays the pattern. The x-axis is month of birth, and the y-axis is average weeks of maternity leave taken in the year following birth. Thus, December 2014 indicates that, on average, mothers who gave birth in December 2014 took about six weeks of maternity leave in the year after birth. The figure includes a linear fit of the six, unexpected 18, expected 18, and 12-week policies.

We highlight several takeaways. First, mothers consistently took exactly six weeks of maternity leave during the six-week policy. Second, there is a sharp increase at the start of the 18-week policy in January 2015. The policy announcement happened in July 2015, well after mothers who gave birth in January had returned to work in February or March, so these early 2015 mothers went back on maternity leave after returning to work between July and their child's first birthday.

Third, maternity leave take-up increased throughout the 18-week policy period such that mothers giving birth in the latter half of the 18-week policy period utilized nearly all 18 weeks of maternity leave.

Finally, there is a sharp decline in leave for babies born in December 2016, with perhaps some mothers with long gestation who were still eligible for the 18 weeks of leave pushing up the average. Maternity leave patterns stabilize at 12 weeks starting in January 2017. Going forward we exclude November–December 2016 birth observations from the formal regression analysis.

Table 2 displays the change in maternity leave, conditional on the column-specific controls. Because non-mothers did not have maternity leave, we use Eq. 1, comparing mothers with six weeks of leave to mothers under more generous policies. In our preferred model in column 3, mothers who received an unexpected additional 12 weeks of leave after returning to work took about 8.4 additional weeks of leave. Those who expected the 12 extra weeks before returning to work averaged 11.1 additional weeks. Those who expected only six additional weeks (a total of 12) generally took the full amount of additional leave. Patterns do not substantively differ when we use the low/high estimates with larger sample sizes but less precision in the leave usage.[8]

One important question for policymakers and firms is whether, under the flexible 18-week policy, mothers used their flexibility or took all of their leave immediately following birth. Figure 3 displays maternity leave by month since birth for each of the four policies. As expected and required, mothers took maternity leave continuously in the six- and 12-week policy periods. Not surprisingly, given the nature of the roll-out, those who received an unexpected additional 12 weeks after returning to work tended to space out their leave over the full year. Those who expected 18 weeks generally used the leave continuously upfront. That is, the mothers who expected a total of 18 weeks and could use the final 12 weeks flexibly over the subsequent year chose to use their leave much as if they had been required to use it all at once. Appendix Figures 7 and 8 break out the patterns by month of birth.

4.2 Crowd-Out of Other Leaves

We next examine whether maternity leave crowds out chargeable leave. We begin with Panel A of Figure 4, which shows chargeable leave usage by mothers (black circles) and matched female non-mothers (gray Xs). Under the six-week policy, mothers always used more leave than non-mothers. Among all females, leave increased over time, possibly due to the draw-down in Afghanistan, changes in quality of leave recording, or changes in preferences for work and leisure. The change in non-mothers is fairly steady over time, with no discernible jumps at any of the key policy changes. Mothers move in parallel to

[8] We prefer the main estimates because they are less subject to measurement error. The lower bound, where the command recorded only six weeks of immediate leave but then did not include any additional leave seems unlikely to have occurred with such frequency given patterns in the non-imputed sample. The upper bound is too generous as we allocate the full available leave for those with incomplete leave data.

non-mothers under the six-week policy, but they decrease their leave usage by over a week once the new policy hits. Indeed, reversing the earlier pattern, mothers use less chargeable leave than non-mothers once they have 18 weeks of maternity leave. Once the policy is reduced to 12 total weeks, non-mother leave remains stable, but mother leave usage increases to match the non-mothers.

Table 3 examines the change in chargeable (Panel A) and total (Panel B) leave associated with each policy. Column 1 uses the fully-specified first-difference approach (column 3 from Table 2). The average change from the six- to 18-week policy is less than a week, though this is likely an underestimate; Figure 4 demonstrates an overall increase in chargeable leave recorded in 2013–2016 across all individuals. Thus, columns 2–5 use various potential comparison groups in the DID framework. Column 2 includes all females that we never observe having a baby as a control, column 3 uses the male matches we never observe having a baby, column 4 uses the female matches, and column 5 uses the female matches from the expanded sample of mothers that used imputation for some maternity leave outcomes. Chargeable leave was not imputed for the imputation sample, but the sample size is larger.

Results are broadly the same across columns 2–5. Using column 4 as an example, the control females used 3.2 weeks of chargeable leave on average. During the six-week maternity leave policy, mothers supplemented their time away with 0.6 weeks more chargeable leave than non-mothers. More generous policies were associated with a substantial reduction in relative chargeable leave. When mothers expected the additional maternity leave, mothers used 1.2 fewer weeks of chargeable leave in the following year than non-mothers (calculated as 0.566-1.731; p-value of difference between mothers and non-mothers=0.000). There was no difference in chargeable leave between mothers and non-mothers in the period with 12 total weeks (p-value=0.556). In sum, relative to similar comparators, mothers used more chargeable leave under the six-week maternity policy, equally used chargeable leave under the 12-week policy, and used less chargeable leave under the 18-week policy.

Because expanded maternity leave crowded out chargeable leave, the total increase in time away from work was lower than what would have been anticipated from changes to maternity leave take-up alone. Panel B of Figure 4 graphically displays total leave of any sort taken by mothers relative to non-mothers under each policy. Table 3 more formally conducts the analysis. Using the matched female control as an example, non-mothers tended to take a total of 3.6 weeks of all leave types across the analysis period. Under the six-week policy, mothers used a total of 6.5 weeks more than non-mothers across all leave types; that is, mothers supplemented with additional leave relative to non-mothers beyond the allotted six weeks. When mothers received an unexpected 12 additional weeks of leave, their difference from the non-mothers only increased by 6.3 weeks (a 53% net utilization of the additional leave). In total, mothers' chargeable leave exceeded non-mothers by only 12.8 weeks (6.5 + 6.3) despite having 18 total weeks of maternity leave available. Those who expected the 12 extra weeks of maternity leave at birth had an 8.8-week relative increase in total leave (73% net take-up), for a total difference from non-mothers of 15.3 weeks. Those who expected a total of 12 weeks of maternity leave at birth had a 5.1-week increase in total leave relative to the six-week policy (85% net take-up), for a total difference from non-mothers of 11.6 weeks.

Patterns are broadly similar when using alternative comparison groups or the mothers with imputed low or high maternity leave. Mothers in the six-week maternity leave period always used more than six weeks of all leave above and beyond non-mothers, and the change in the mother/non-mother gap was always smaller than the additional maternity leave granted under more generous policies.

4.3 Leave During Pregnancy

If mothers with more maternity leave use less chargeable leave after birth, they may instead use that chargeable leave before birth. Table 4 explores this possibility by examining the chargeable leave used in the 0–3 months prior to birth by month of birth for the mothers and their matches across expected maternity leave. Table 4 indicates that, on average, mothers use about half a day less leave than similar women in the three months before birth. This pre-birth pattern does not change when mothers know they have additional maternity leave available.

4.4 Heterogeneity of Impacts

We examine whether take-up and crowd-out are similar across several groups: enlisted (workers) versus officers (managers), new mothers having their first child versus experienced mothers, single versus married mothers, and white versus non-white mothers. Considering England (1982) and Budig (2002), we examine individuals from job types with more and fewer females, as job types with different gender segregation may have different attitudes towards leave take-up. We also differentiate by O*NET-defined job physicality (based on whether a Marine job requires physical skills that are above or below the average Marine job).[9]

We begin by examining the officer/enlisted difference in columns 1–2 in Panel A of Table 5. The mean leave taken when mothers expected and received six weeks of leave is six weeks for both officers and enlisted. The increase in maternity leave is larger for enlisted than officers when mothers received 12 additional weeks of maternity leave, whether the leave is unexpected (8.6 weeks for enlisted versus 5.7 weeks for officers, p-value of difference=0.006 using a test of coefficients across equations) or expected (11.2 weeks for enlisted versus 10.0 weeks for officers, p-value=0.000). Once leave drops to 12 total weeks, there is again no statistical difference between the enlisted/officers. There was substitution of chargeable leave post-pregnancy. Before birth, officer mothers-to-be use about 2.7 fewer days than the matched officer females, while enlisted mothers and non-mothers were about the same. These patterns did not differ after gaining additional maternity leave. Overall, officer mothers use less leave before birth and use less of the 18 weeks of leave.

In the six-week policy, experienced mothers (who had dependent children before the observed birth event) saved some chargeable leave in the final three months of pregnancy relative to their matches, while new mothers did not. Both groups used six weeks of maternity leave, with about the same chargeable leave in the year following birth. Once mothers knew maternity leave was more generous, experienced mothers stopped saving leave before birth but also used less of the additional maternity leave than new mothers. When the policy reverted to 12 total weeks, experienced mothers reverted to saving leave during pregnancy, the groups' maternity leave was similar, and there was no difference in post-birth chargeable leave crowd-out.

Single (unmarried) mothers may also react differently to the policy than married mothers. In the six-week policy, single mothers saved leave during pregnancy, and both groups used the full six weeks

[9]We characterize physicality as described in Bacolod and Rangel (2017) and Zunic (2018).

of maternity leave. There are no differences in pregnancy or maternity leave as the policies change. However, when mothers could plan ahead for the expected extra 12 weeks of leave, married mothers had larger crowd-out of chargeable leave than single mothers (-2.1 weeks versus -1.4 weeks, p-value=0.003), meaning the most generous policy resulted in larger net increases in leave-taking for single mothers than married mothers.

There are no consistent differences across policy periods for white and non-white mothers, mothers in more- or less-female jobs, or by level of job physicality across pregnancy, maternity, or post-birth chargeable leave (see Appendix Table 9).

The 18-week policy resulted in greater heterogeneity in leave usage than was observed under the six-week policy; the same is true of the 12-week policy to a lesser degree. Figure 5 graphs a locally weighted scatterplot smoothing line of the one-year maternity leave used by the 10th, 25th, 50th, 75th, and 90th percentile for the given birth month. The 90-10 gap is small in the six-week policy time frame: almost everyone took six weeks of leave. The lines spread out for the more generous policy: the 90-10 gap is over 10 weeks in the beginning of the 18-week policy. Though that narrows over time, the 90-10 gap remains around six weeks by the end of the 18-week policy and remains at several weeks under the 12-week policy. This continued gap is largely driven by officers; enlisted across all percentiles generally take the full maternity leave except in early 2015. Thus, our estimates for average leave usage are driven by a long tail of women who under-use leave under more generous policies; the median woman generally takes the full leave under all policies except when leave was added several months after she had given birth.

5 Conclusion

As the United States continues to consider a national maternity leave policy, we show how leave policies affect use of various forms of paid leave. Our results indicate that six weeks of maternity leave is inadequate in meeting the needs of most mothers. Under the six-week policy, mothers used all of their maternity leave and supplemented with additional chargeable leave. In the absence of income effects, mothers would likely take more than six weeks of leave if available, even in a large male-dominated setting. This is consistent with Baum and Ruhm (2016) who find that mothers in California took more leave under full income replacement.

Expanding maternity leave comes at a cost to either the government or employers. However, with more generous leave available, mothers did not use the full leave, indicating that program costs are likely lower than simply $weekly\ cost \times available\ weeks\ of\ maternity\ leave$. For firms considering expanding leave, the additional time firms will be short-staffed due to birth is likely less than the amount of paid maternity leave provided; under the status quo, women often find ways beyond maternity leave to facilitate time away from work post-birth. Here, the expansion of maternity leave crowds out chargeable leave, and variation in leave used increases substantially across individuals. Firms that provide paid vacation and sick days should see those getting crowded out with a maternity leave expansion.

Since we find more generous leaves are taken up disproportionately by enlisted mothers and single mothers, firms with larger shares of less-advantaged workers may also have different patterns than firms with more-advantaged workers. With less-advantaged mothers disproportionately taking up increased leave, maternity leave expansions could narrow socioeconomic disadvantages, given the health benefits of leave for mothers and children.

One concern with flexible leave options for new mothers is that mothers will take leave in an unpredictable way. Federal workers can use their family leave within a year of birth, and Congress recently proposed a flexible policy for military parents (Military Times 2021). Here, mothers demonstrate a strong preference for leave immediately following birth. Though some mothers may have reasons to use the more flexible leave, firms may not see sporadic leave usage even if they provide flexible options.

Our context provides insight into how leave take-up might vary over the six, 12, or 18-week options that are common in the U.S. labor market with 100% income replacement. The Marines Corps is potentially not representative of typical civilian firms. However, the employment environment of the military may provide insight into other heavily male-dominated occupations.

The internal labor market of the military at higher ranks is also similar to other tournament-style professions such as lawyers and academics. There is no lateral entry, and Marines who are not selected for promotion to the next rank leave the service. The labor supply responses of female officers indicate that mothers in tournament-style civilian professions may also choose their leave lengths to optimize their career continuity. More broadly, we find that mothers with lower career attachment and who are less-advantaged in terms of family structure and education are the ones increasing take-up with policy expansions. Higher-skilled and higher-earning women take relatively shorter job interruptions for childbirth, consistent with the literature on the motherhood wage penalty.

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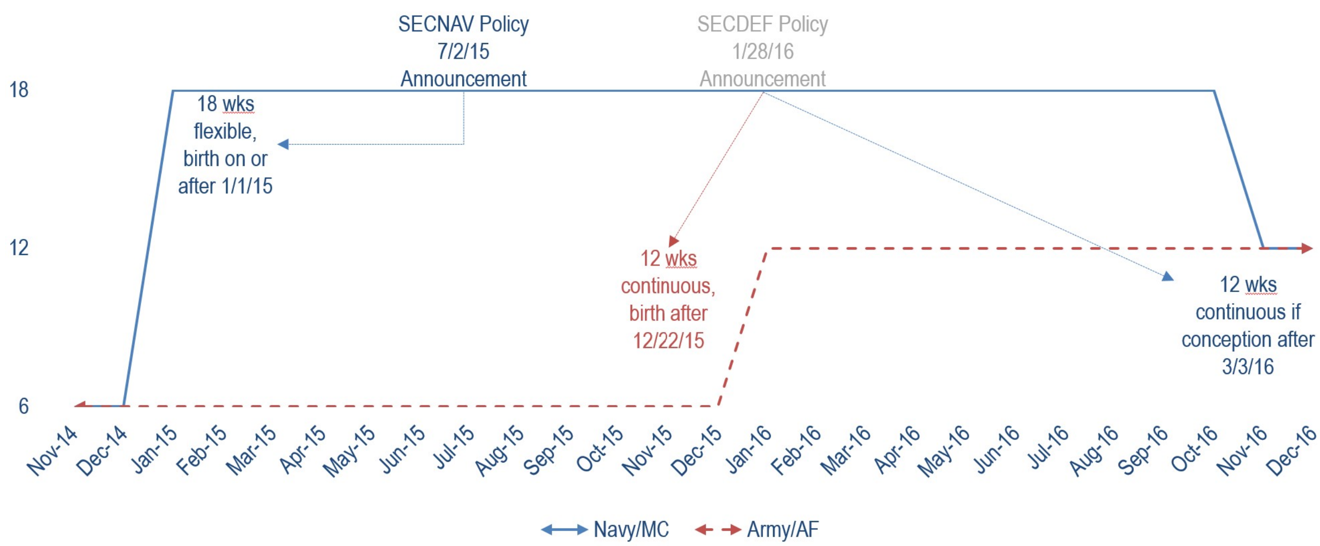
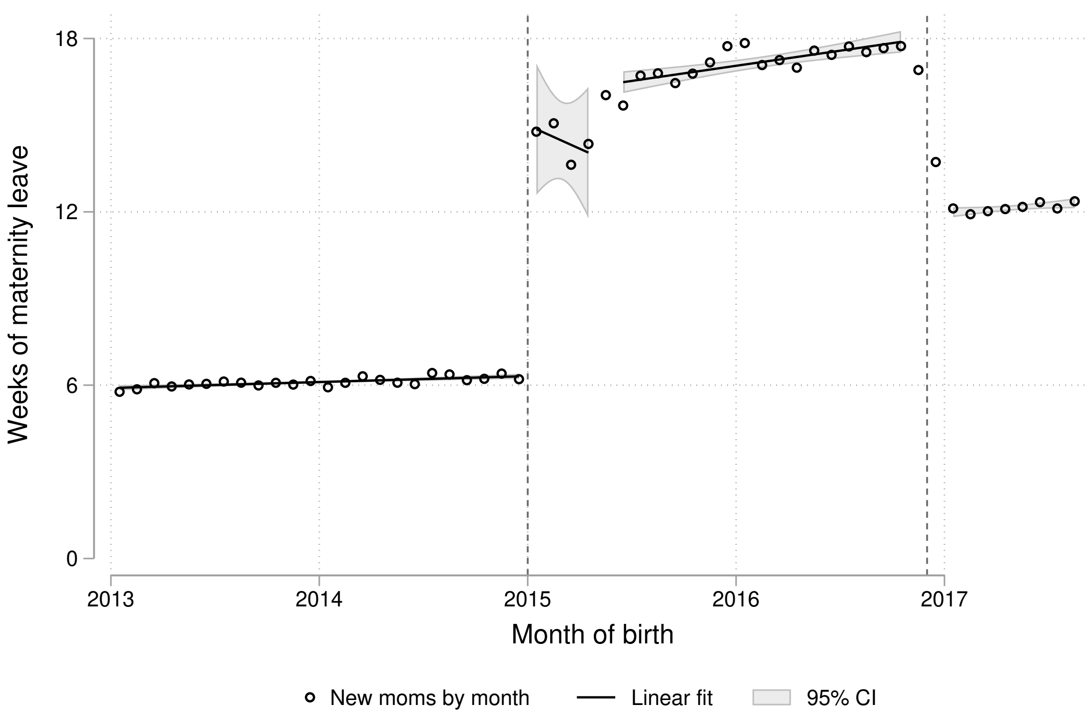
6 Figures

Figure 1: Policy Changes Over Time



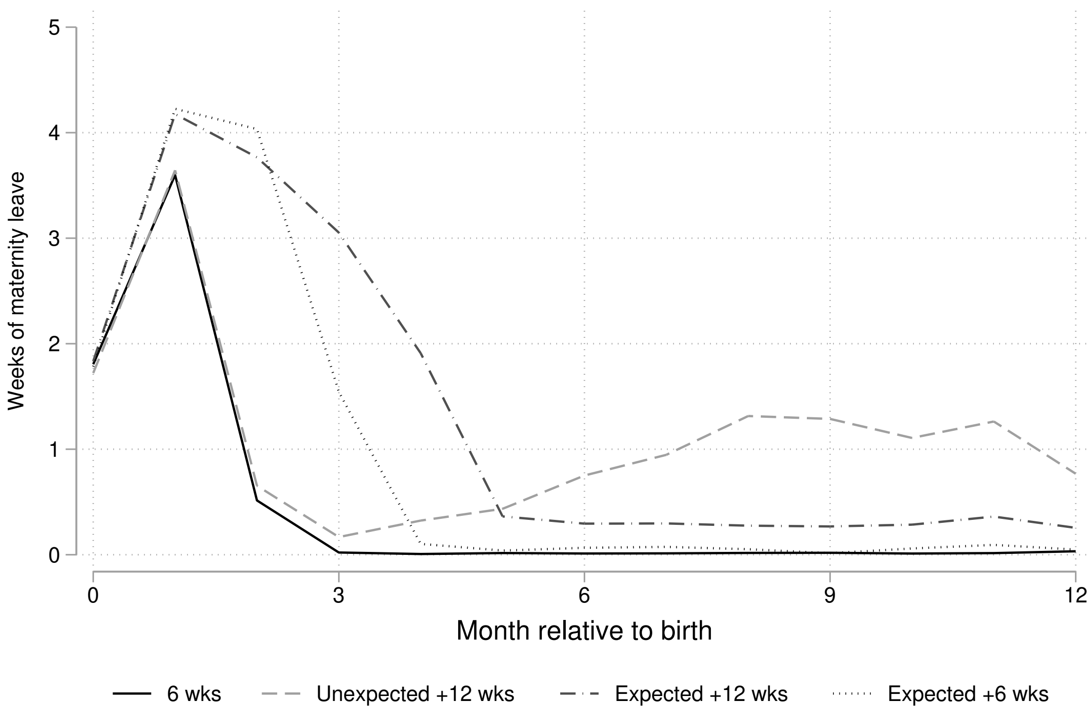
Notes: The figure plots policy changes by branch (Navy/Marine Corps and Army/Air Force) based on changes from the Secretary of the Navy (SECNAV) and Secretary of Defense (SECDEF). Y-axis is total leave available to women by date of birth on the X axis.

Figure 2: Yearly Maternity Leave by Month of Birth for Mothers



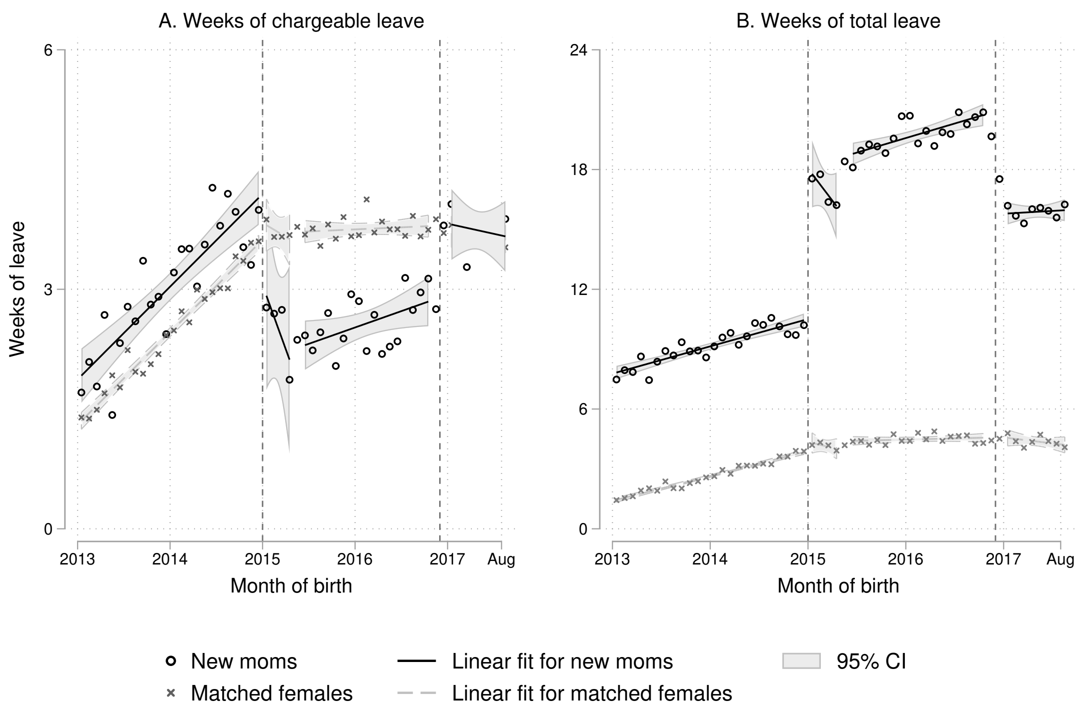
Notes: The figure plots average maternity leave used in the 12 months following birth by month of birth. Vertical lines indicate a change in maternity leave from six to 18 weeks (as of January 1, 2015) and from 18 to 12 weeks (around November/December 2016). Figure includes linear fit of leave for six, unexpected 18, expected 18, and 12 weeks with a donut excluding May 2015 and November/December 2016.

Figure 3: Monthly Maternity Leave by Policy for Mothers



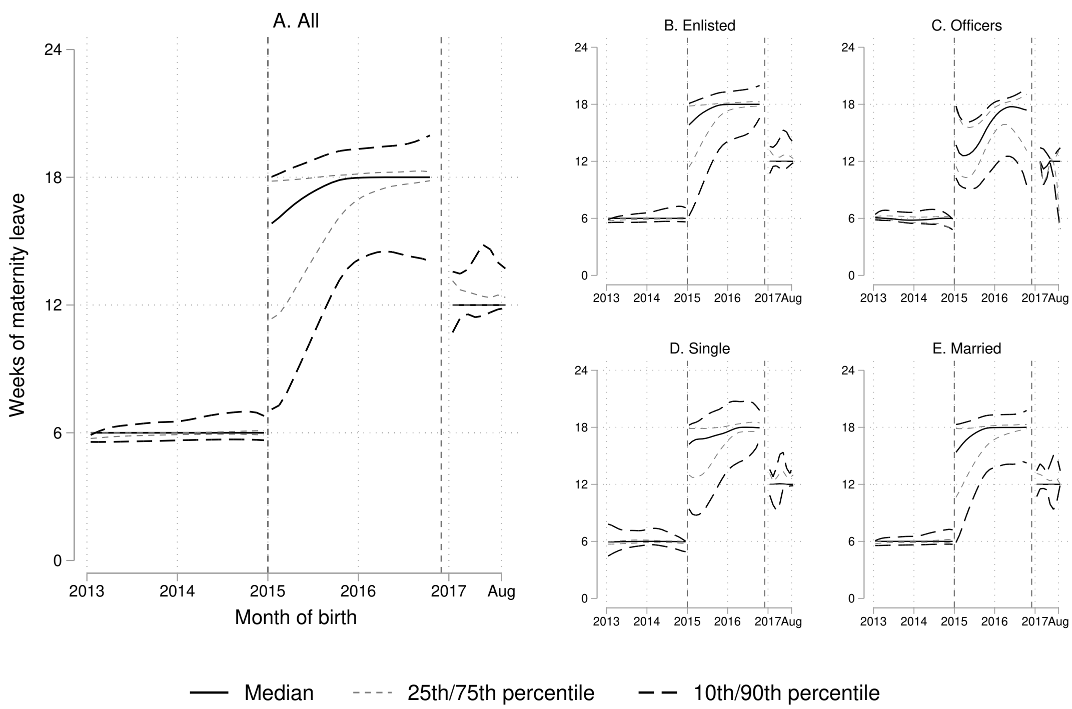
Notes: The figure plots average maternity leave used in each of the 12 months following birth by policy, excluding May 2015 and November/December 2016.

Figure 4: Annual Chargeable and Total Leave by Month of Birth for Mothers and Female Comparisons



Notes: The figure plots average chargeable (annual) and total (maternity and chargeable) leave used in the 12 months following birth by month of birth or month of match. Vertical lines indicate a change in maternity leave from six to 18 weeks (as of January 1, 2015) and from 18 to 12 weeks (around November/December 2016). Figure includes linear fit of leave for six, unexpected 18, expected 18, and 12 weeks with a donut excluding May 2015 and November/December 2016.

Figure 5: Distribution of Maternity Leave by Month of Birth for Mothers



Notes: The figure plots average maternity leave used in the 12 months following birth by month of birth, at the 10th, 25th, 50th, 75th, and 90th percentiles for a given month, as well as the median leave taken. Panel A is all mothers; Panels B and C split the sample by enlisted/officer; Panels D and E split the sample by single/married. Vertical lines indicate a change in maternity leave from six to 18 weeks (as of January 1, 2015) and from 18 to 12 weeks (around November/December 2016). Figure includes linear fit of leave for six, 18, and 12 weeks with a donut excluding May 2015 and November/December 2016.

7 Tables

Table 1: Summary Statistics

	Mothers		All others		Matches		
	Main	Imputed	All	F	M	F	F
Age	24.70	24.57	24.91	24.16	25.02	24.73	24.57
p	.	.	0.052	0.000	0.006	0.873	0.952
Black	0.17	0.17	0.11	0.16	0.19	0.17	0.17
p	.	.	0.010	0.010	0.132	0.720	0.729
Hispanic	0.26	0.26	0.18	0.25	0.29	0.26	0.27
p	.	.	0.006	0.133	0.019	0.926	0.699
Other	0.13	0.13	0.08	0.11	0.13	0.12	0.11
p	.	.	0.000	0.594	0.921	0.360	0.162
Officer	0.08	0.08	0.09	0.10	0.08	0.08	0.08
p	.	.	0.000	0.000	1.000	1.000	1.000
Warrant	0.01	0.01	0.01	0.01	0.01	0.01	0.01
p	.	.	0.041	0.797	1.000	1.000	1.000
Time_in_service	4.90	4.77	5.01	4.17	5.20	4.97	4.80
p	.	.	0.000	0.000	0.005	0.627	0.786
Married	0.75	0.74	0.35	0.31	0.77	0.75	0.74
p	.	.	0.000	0.000	0.081	0.848	0.844
Divorced	0.06	0.06	0.03	0.08	0.06	0.06	0.06
p	.	.	0.000	0.000	0.926	0.345	0.522
Prior_kids	0.35	0.35	0.35	0.19	0.36	0.31	0.31
p	.	.	0.000	0.000	0.431	0.102	0.049
Some_college	0.05	0.04	0.03	0.04	0.05	0.05	0.04
p	.	.	0.000	0.959	0.925	0.970	0.953
College	0.10	0.10	0.11	0.12	0.11	0.10	0.10
p	.	.	0.000	0.000	0.538	0.545	0.788
AFQT	59.66	59.56	64.74	63.20	58.89	59.73	59.62
p	.	.	0.006	0.000	0.066	0.911	0.902
GCT	102.99	102.95	110.16	105.46	103.02	103.07	103.05
p	.	.	0.000	0.000	0.925	0.845	0.789
Comparison			Main	Main	Main	Main	Imputed
Gender			All	F	M	F	F
Observations	2,424	2,955	9,823,488	763,263	12,030	10,657	12,750
N of individuals	2,235	2,692	326,028	27,433	9,984	3,797	4,291
F-test	.	.	1705.13	109.20	3.03	0.70	0.70
p-value of F-test	.	.	0.000	0.000	0.000	0.780	0.777

Notes: Observation period is January 2013 to August 2017. Mother columns display characteristics for month of birth by birth event for the main sample and the imputed sample. All others columns display characteristics for multiple observations per individual across months within all Marines not observed having a baby (All) and all female Marines not observed having a baby (F). Match columns display descriptive characteristics for the month of the match to mothers for males we do not observe having a baby matched to the main sample (M), females we do not observe having a baby matched to the main sample (F), and females we do not observe having a baby matched to the imputed sample (F), weighted by match weights. The p-values indicate statistical difference relative to mothers as noted in the comparison row using robust standard errors clustered by individual. F-test assesses whether the listed characteristics jointly predict motherhood for the given column and its noted mother comparison group.

Table 2: Maternity Leave Used 12 Months Post-birth

	Main mother sample			Lower/upper bound	
	(1)	(2)	(3)	(4)	(5)
Unexpected +12 wks	8.366***	8.371***	8.387***	8.321***	8.508***
	(0.326)	(0.323)	(0.324)	(0.313)	(0.303)
Expected +12 wks	11.080***	11.106***	11.107***	10.291***	11.215***
	(0.110)	(0.109)	(0.111)	(0.133)	(0.097)
Expected +6 wks	6.066***	6.075***	6.093***	4.894***	6.113***
	(0.133)	(0.133)	(0.133)	(0.151)	(0.098)
Month FE	X	X	X	X	X
Rank group FE			X	X	X
Location FE			X	X	X
Job type FE			X	X	X
Controls		X	X	X	X
Observations	2424	2424	2424	2955	2955
N of individuals	2235	2235	2235	2692	2692
R-squared	0.812	0.816	0.819	0.717	0.838
6-week policy mean	6.121	6.121	6.121	6.113	6.117

Notes: Robust standard errors clustered by ID in parentheses. *$p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Reference group is female Marines who gave birth during the 6-week maternity leave policy period and received 6-weeks of maternity leave.

Table 3: Chargeable and Total Leave Used 12 Months Post-birth

	Mothers	Females	Matched comparators		Bounding	
	(1)	(2)	(3)	(4)	(5) Lower	(6) Upper
A. Chargeable leave						
Baby Appeared	0.000	1.052***	0.456***	0.566***	0.429***	
	(.)	(0.068)	(0.074)	(0.082)	(0.077)	
Baby × Unexpected +12 wks	-0.369*	-1.338***	-1.749***	-1.777***	-1.628***	
	(0.169)	(0.156)	(0.169)	(0.179)	(0.169)	
Baby × Expected +12 wks	-0.594***	-1.866***	-1.667***	-1.731***	-1.580***	
	(0.093)	(0.091)	(0.098)	(0.110)	(0.104)	
Baby × Expected +6 wks	0.705***	-0.791***	-0.436***	-0.497***	-0.368**	
	(0.126)	(0.121)	(0.131)	(0.143)	(0.127)	
R-squared	0.104	0.243	0.147	0.170	0.177	
Control mean	3.073	2.477	3.303	3.183	3.125	
p(baby+unexpected)=0		0.044	0.000	0.000	0.000	
p(baby+expected 12)=0		0.000	0.000	0.000	0.000	
p(baby+expected 6)=0		0.010	0.861	0.556	0.548	
B. Total leave						
Baby Appeared	0.000	6.961***	6.451***	6.499***	6.352***	6.351***
	(.)	(0.078)	(0.084)	(0.093)	(0.087)	(0.087)
Baby × Unexpected +12 wks	8.017***	6.790***	6.434***	6.297***	6.541***	6.633***
	(0.370)	(0.355)	(0.360)	(0.376)	(0.359)	(0.353)
Baby × Expected +12 wks	10.513***	8.626***	9.098***	8.814***	8.161***	9.100***
	(0.147)	(0.144)	(0.148)	(0.173)	(0.180)	(0.156)
Baby × Expected +6 wks	6.798***	4.716***	5.324***	5.084***	4.105***	5.264***
	(0.183)	(0.177)	(0.184)	(0.201)	(0.201)	(0.170)
R-squared	0.711	0.281	0.852	0.846	0.805	0.853
Control mean	.	2.877	3.567	3.643	3.573	3.573
p(baby+unexpected)=0		0.000	0.000	0.000	0.000	0.000
p(baby+expected 12)=0		0.000	0.000	0.000	0.000	0.000
p(baby+expected 6)=0		0.000	0.000	0.000	0.000	0.000
Match gender			M	F	F	F
Month FE	X					
Month-year FE		X	X	X	X	X
Rank group FE	X	X	X	X	X	X
Location FE	X	X	X	X	X	X
Job type FE	X	X	X	X	X	X
Observations	2424	765687	14454	13081	15705	15705
N of individuals	2235	29668	12219	6032	6983	6983

Notes: Robust standard errors clustered by ID in parentheses. $^{+}p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Reference groups: Model (1) is female Marines who gave birth during the 6-week maternity leave policy period and received 6 weeks of maternity leave; Model (2) is females with no birth events; Model (3) is the matched group of males with no observed birth events; Model (4) is the matched group of females with no observed birth events; and Models (5) and (6) are the matched group of females with no observed birth events with imputation for maternity leave. Chargeable leave is not imputed so is the same for lower/upper bounding.

Table 4: Total Chargeable Leave Used 0–3 Months Pre-birth

	Mothers	Females	Matched comparators	
	(1)	(2)	(3)	(4)
Baby Appeared	0.000	-0.107***	-0.151***	-0.063*
	(.)	(0.023)	(0.023)	(0.025)
Baby × 18 weeks announced	0.578***	0.149**	0.044	0.022
	(0.047)	(0.047)	(0.048)	(0.053)
Baby × 12 weeks announced	0.498***	0.011	-0.006	-0.037
	(0.045)	(0.044)	(0.042)	(0.044)
Match gender			M	F
Month FE	X			
Month-year FE		X	X	X
Rank group FE	X	X	X	X
Location FE	X	X	X	X
Job type FE	X	X	X	X
Observations	2996	669257	23891	21454
N of individuals	2737	27010	19749	9719
R-squared	0.124	0.095	0.113	0.128
Control mean	2.682	2.515	2.730	2.738
p(baby+18 wks)=0		0.308	0.013	0.392
p(baby+12 wks)=0		0.011	0.000	0.006

Notes: Robust standard errors clustered by ID in parentheses.
*$p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Reference groups: Model (1) is female Marines who gave birth believing they had the 6-week maternity leave policy period; Model (2) is females with no birth events; Model (3) is the matched group of males with no observed birth events; and Model (4) is the matched group of females with no observed birth events.

Table 5: Leave Types Used by Subgroups 12 Months Post-birth

	Grade		Experience		Marital Status	
	Enlisted	Officer	New	Not new	Single	Married
A. Maternity leave						
Unexpected +12 wks	8.56***	5.66***	8.54***	7.85***	8.84***	8.14***
	(0.33)	(1.10)	(0.36)	(0.64)	(0.63)	(0.37)
Expected +12 wks	11.20***	9.96***	11.25***	10.71***	11.25***	11.03***
	(0.12)	(0.38)	(0.13)	(0.22)	(0.22)	(0.13)
Expected +6 wks	6.09***	5.69***	6.03***	6.22***	6.04***	6.06***
	(0.13)	(0.62)	(0.15)	(0.27)	(0.21)	(0.16)
Observations	2214	210	1778	646	610	1814
p(diff, unexpected)		0.006		0.329		0.330
p(diff, expected +12)		0.000		0.034		0.359
p(diff, expected +6)		0.457		0.587		0.905
B. Chargeable leave						
Baby Appeared	0.57***	0.38	0.68***	0.29+	0.24+	0.74***
	(0.09)	(0.27)	(0.09)	(0.16)	(0.14)	(0.11)
Baby × Unexpected +12 wks	-1.86***	-0.94	-1.74***	-2.14***	-1.74***	-2.16***
	(0.18)	(0.64)	(0.20)	(0.36)	(0.32)	(0.28)
Baby × Expected +12 wks	-1.69***	-2.10***	-1.73***	-1.82***	-1.37***	-2.06***
	(0.12)	(0.34)	(0.12)	(0.22)	(0.19)	(0.17)
Baby × Expected +6 wks	-0.53***	-0.05	-0.59***	-0.30	-0.22	-0.65*
	(0.15)	(0.54)	(0.16)	(0.32)	(0.26)	(0.25)
Observations	11943	1138	9904	3177	3625	8578
Comparison mean	3.129	3.745	3.093	3.479	3.154	3.192
p(diff, baby)		0.452		0.067		0.002
p(diff, baby × unexpected)		0.139		0.502		0.246
p(diff, baby × expected +12)		0.265		0.834		0.003
p(diff, baby × expected +6)		0.346		0.330		0.156
C. Pregnancy leave						
Baby Appeared	-0.04	-0.39***	-0.01	-0.18***	-0.12**	-0.04
	(0.03)	(0.09)	(0.03)	(0.05)	(0.04)	(0.03)
Baby × 18 wks announced	0.02	0.04	-0.06	0.20+	0.10	-0.01
	(0.06)	(0.16)	(0.06)	(0.12)	(0.10)	(0.06)
Baby × 12 wks announced	-0.05	0.09	-0.06	-0.03	0.06	-0.08
	(0.05)	(0.15)	(0.05)	(0.09)	(0.08)	(0.05)
Observations	19856	1591	16543	4904	6355	15095
Comparison mean	0.902	1.194	0.911	0.969	0.896	0.934
p(diff, baby)		0.000		0.014		0.044
p(diff, baby × 18 wks)		0.886		0.046		0.240
p(diff, baby × 12 wks)		0.334		0.648		0.084

Notes: Robust standard errors clustered by ID in parentheses. $^{+}p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
For each regression, the treated and reference groups are limited to the category indicated by the column header. For Panel A, the first-differences reference group is moms who gave birth under the 6-week policy. For Panels B and C, the difference-in-dfferences reference group is the matched controls to females.

Online Appendix for *Mothers in the Military: Effect of Maternity Leave Policy on Take-Up*

A.1 Data Appendix

Active-duty service members earn 30 calendar days of annual leave per year (accrued at a rate of 2.5 days per month). To take a full week (including weekends) of leave, individuals use seven days of annual leave. Service members can carry over a maximum of 60 days of accrued leave from one fiscal year to another, and any leave in excess of 60 days is lost by a service member on October 1 of each new fiscal year. A service member can sell back up to 60 days of leave during their career; the remainder is forfeited (Absher 2021). Annual leave allows new mothers flexibility for managing their pregnancy and post-birth time away across all policy periods.

Our data covers the population of active-duty Marines from January 2013 through August 2018, largely from the Total Force Data Warehouse, including detailed leave data. Prior to 2016, the USMC coded all maternity leave under the sick leave type. In 2016, they generated a maternity-specific leave type code to supersede the sick leave type for maternity purposes. This change caused overlap of maternity and sick leave used for some individuals in our data set. We remove overlapping occurrences of sick and maternity leave, giving precedence to maternity leave in cases where a newborn appears. In other cases, permissive temporary additional duty (PTAD) leave or emergency leave were recorded postpartum rather than maternity leave, and we include these leave types as maternity leave. Leave does not begin to be charged until the woman leaves the hospital.

Different commands used different leave types for maternity leave over time. We define "maternity leave" as the combination of what was recorded as maternity, sick, permissive temporary additional duty (PTAD), and emergency leave to capture the maximum amount of birth-related leave available to mothers.

Most leave is recorded in a centralized system. Maternity leave was recorded in one of two ways for Marines. The majority of leave (59% of birth events with one year of subsequent service observed) was recorded using a specific leave code that calculated leave systematically in the system, but certain Marines had no or very limited maternity leave recorded in that system. Instead, their command used a series of textual notes to track maternity leave. Sometimes this was straightforward, identifying the date the woman went on maternity leave and the date she returned to work (13% of birth events) or the date of birth and the date she returned to work (15%). In the latter instances, we estimated the start of leave based on the date of birth. We allowed for two days of in-hospital stay, which does not count against a woman's maternity leave in this system. In other cases, either no leave was recorded or the leave was recorded as a change of duty status (13%). For instance, after leave expansion, the first six weeks of leave were administratively considered separate from the new additional leave, and women were recorded as in a "medical" status for the first six weeks before being moved to a "non-deployable" status for an extended period. It is possible that such women really only took six weeks of leave and then returned to work, it is also possible that they took the full 12 or 18 weeks of leave available, or it is possible that they took some other amount of leave. To minimize measurement error, we exclude such women in the main analysis; we verify that having this data as missing is unrelated to any other observable characteristic in the data. In supplementary analysis, we also impute a "low" estimate using six weeks and a "high" estimate using the maximum leave available to these ambiguously-coded women to estimate a range of potential outcomes for the full sample of women. We call this the imputation sample.

Pregnant service members cannot deploy to combat zones and are sent home if a pregnancy is discovered while deployed. Women could not deploy for the 12 months following birth in the time frame we examine here. For everyone else, there is little time for annual leave while deployed, so those returning home have likely accrued annual leave. Additionally, those returning from deployment receive combat leave, with duration depending on deployment length. Thus, non-pregnant females who are not new mothers may have somewhat different leave options available than pregnant women and new mothers.

We limit our sample to Marines younger than 45 years to capture women of childbearing age. We also do not include any observations of individuals stationed in a country or U.S. state in which we never observe a female give birth (e.g., Argentina and Alaska), as these imply a type of assignment that was likely off-limits to pregnant women. We do retain leave taken while in these locations and include it in the yearly leave calculation for individuals who are stationed elsewhere in a prior period. So, for instance, for a female in North Carolina in December 2015 who is then stationed in Iraq in 2016, we retain the December 2015 observation, and our calculation of leave for the subsequent year would include time she was in Iraq. We do not want to exclude the potential comparison while she was in North Carolina, as that point serves as a relevant counterfactual to what could have happened to a woman who instead gave birth in December 2015 and remained in North Carolina in 2016.

For the fixed effects, military occupational categories are infantry, infantry support, aviation, and other based on specific job types. Rank groups are Private/Private First Class, Lance Corporal, Corporal, Sergeant, Staff Sergeant, Gunnery Sergeant, and Master Sergeant for enlisted; warrant officers; and Lieutenant, Captain, or Senior Officer for officers. No generals are below the age cutoff. Unit locations are at the state-level for places where we observe at least 50 births to females (Arizona, California, DC, Hawaii, North Carolina, South Carolina, and Virginia). We group remaining births into two groups for the other U.S. states and international births (which mostly occurred in Japan).

Because eligibility for the 18- versus 12-week policy was based on date of conception, it is not obvious which policy babies born in the November/December 2016 time frame fall under. A mother with a March 2, 2016, conception date who gave birth at 42 weeks gestation would have her baby on December 21, 2016. Most mothers with a March 2 or earlier conception date give birth before December. Mothers who conceived on March 3 and gave birth before about 38.9 weeks could have fallen under the 12-week policy, though their children were born in November. Thus, we exclude babies born in November and December from our analysis.

An alternative to examining yearly patterns is to look at leave usage by month. Appendix Figure 7 shows average leave usage by month since birth for the November 2014–October 2015 birth months. The 2014 mothers used their leave immediately, with occasional small exceptions that gave them more health leave later in the year. The early 2015 mothers used their initial six weeks of leave immediately, then started sporadically using their additional 12 weeks of leave once the expanded policy was announced. For instance, the January 2015 mothers used their leave in January–March (months 0–2), depending on birth timing within January. They have an uptick in usage again in July when the new policy was announced (month 6) that continues on through the remainder of the year. There is a particular spike in December (month 11 for January births). July–October 2015 mothers, who knew about the leave at birth, tended to continuously use leave upfront. Figure 8 shows the same patterns over the transition from 18 to 12 weeks.

An alternative identification strategy could compare new mothers to mothers of older children. However, this is problematic because the annual leave available to mothers of older children is affected by the decisions they made when they were new mothers, which was (as we demonstrate) affected by maternity leave policy. We conducted an analysis where we set aside this problem and used the mothers of children aged 1–5 to form a counterfactual group of mothers who still had to care for young children. This was a relatively small group of women, and we could not perfectly match them to mothers of younger children on the observable characteristics. Still, we generally found slightly larger (in absolute terms) coefficients on the chargeable leave analysis and smaller (in absolute terms) coefficients on the total leave analysis, with standard errors several times larger than in the main analysis. Due to both policy spillover concerns and poor observable comparability, we do not include this group in our main analysis.

A.2 Limiting to Those Surprised by the Policy Change

One potential worry with the analysis is that female Marines who knew they would have more leave made different fertility choices than they did with only six weeks of leave. Thus, we confirm that patterns are similar for mothers who could not have chosen to get pregnant based on the policy at the time of conception in the odd columns of Appendix Table A.4. The July 2, 2015, policy announcement was retroactive to January, and females who conceived on July 1 or earlier did not make the decision to become pregnant based on knowledge of the additional leave. These mothers would have given birth around March 11, 2016, at the latest.[10] To be conservative, we limit the pregnancy-limited analysis to those who gave birth in February 2016 and earlier in the odd columns of Appendix Table 10; this necessarily excludes any births under the 12-week policy.

Another potential concern is that knowledge of the policy affected abortion decisions. We find this scenario unlikely, but to verify, the even columns of Appendix Table 10 limits the analysis to the cohort of pregnancies that likely already terminated their pregnancies by July 2. Because 90.0% of abortions happen in week 13 of pregnancy or earlier (Jatlaoui et al., 2019), pregnancy termination decisions were likely determined prior to the policy announcement for births that occurred in December 2015 or earlier.[11]

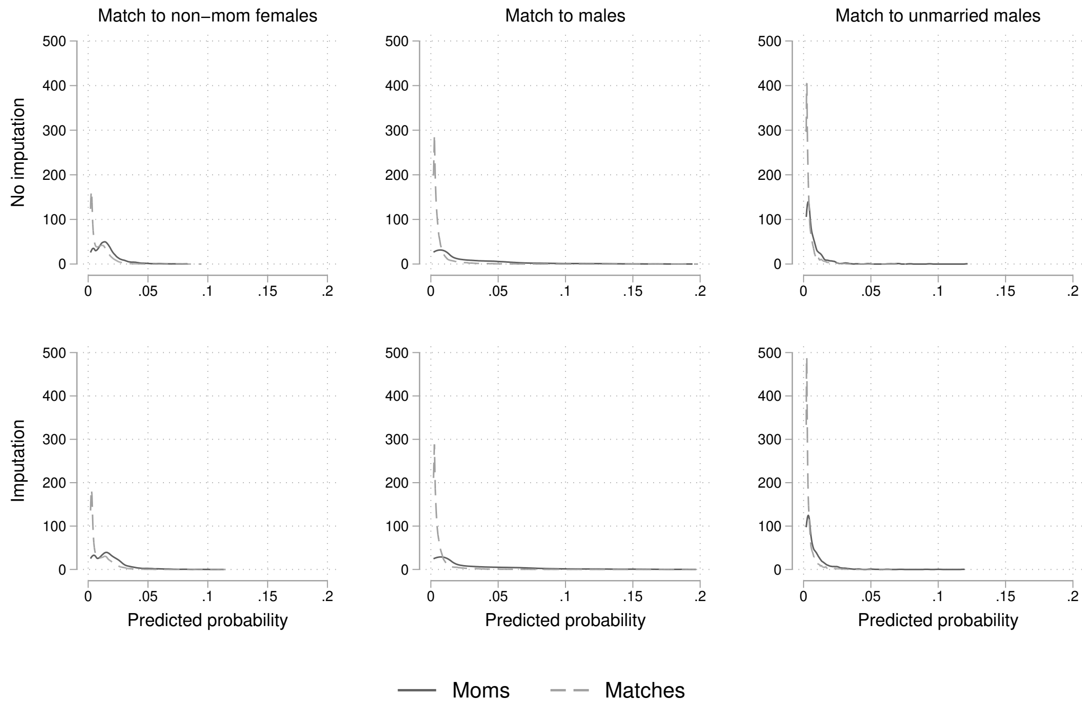
In both cases, the results are fundamentally the same as the main results, though with larger standard errors, and we take this as evidence that pregnancy and abortion decisions did not determine patterns we observe.

[10] Calculated as July 1, 2015 – 14 days + 268 days, based on a typical conception 14 days following prior menses and a 268 day pregnancy (Jukic et al, 2016).

[11] Calculated as July 1, 2015 – 13 weeks $\times$ 7 days/week $+$ 268 days.

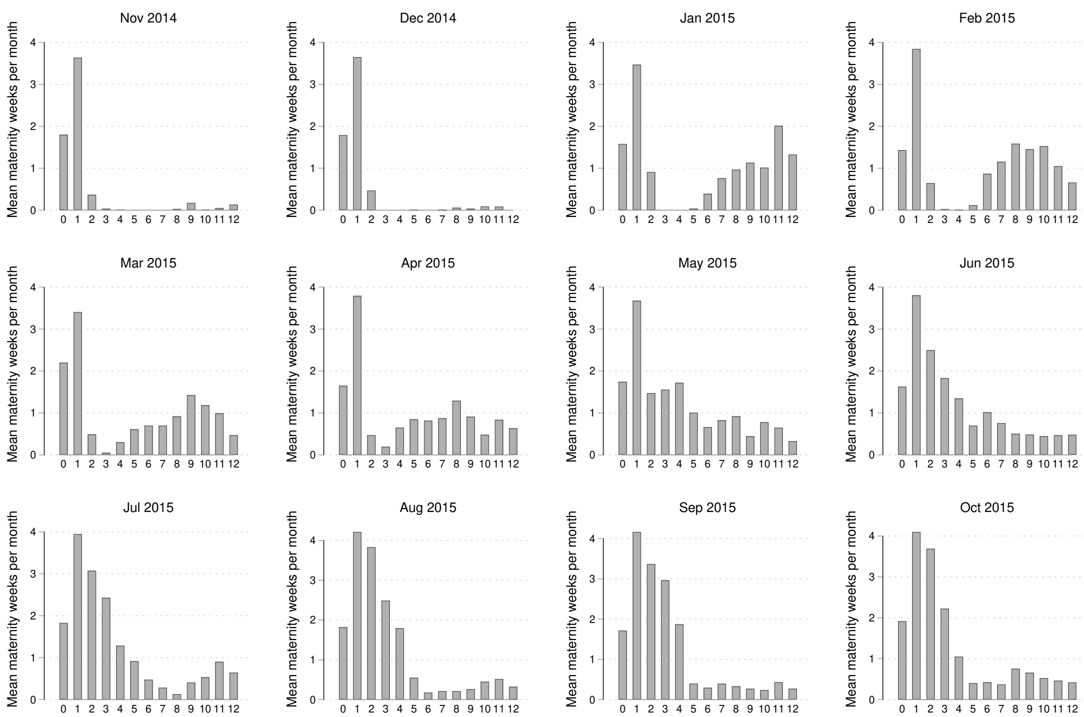
A.3 Online Appendix Figures

Figure 6: Probability Density by Method for Mothers and Female Matches



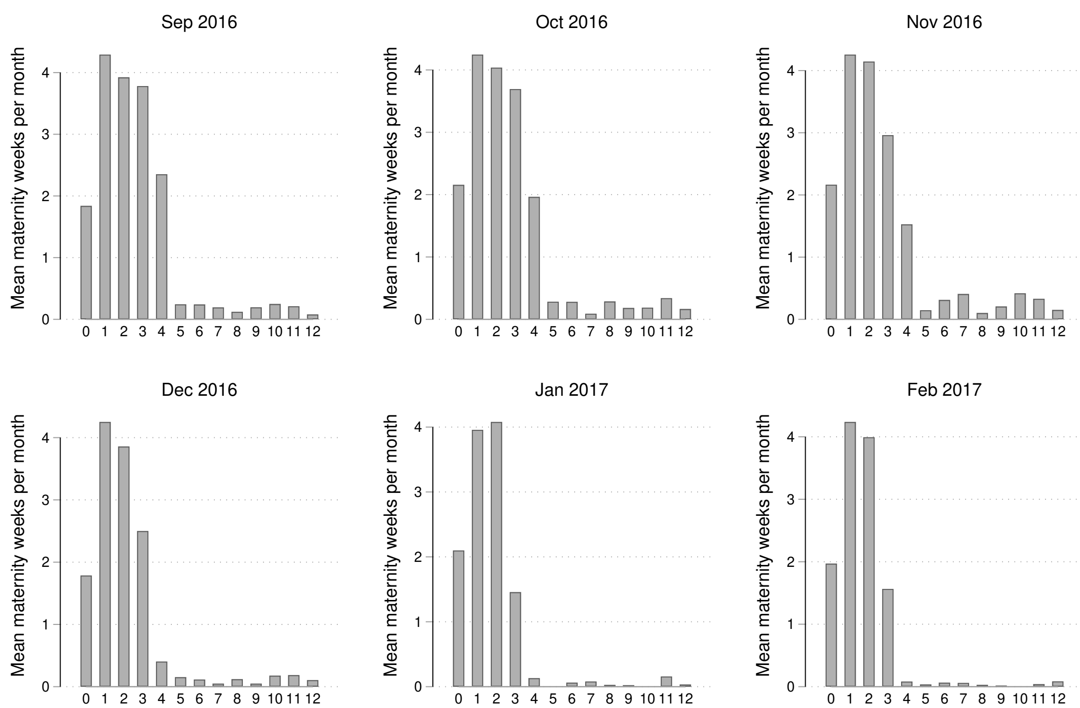
Notes: The figure plots the kdensity for new mothers and their respective matches by predicted probability for each of the six match types, limited to predicted probabilities from 0.2–20% for visibility purposes; majority of matches are below 0.2%.

Figure 7: Monthly Maternity Leave Used by Month of Birth over Policy Transition (6 to 18 Weeks)



Notes: The figure plots maternity leave used by month for the months surrounding the change from six (continuous) weeks to 18 (flexible) weeks. The policy announcement was in July 2015 and was retroactive to January 2015.

Figure 8: Monthly Maternity Leave Used by Month of Birth over Policy Transition (18 to 12 Weeks)



Notes: The figure plots maternity leave used by month for the months surrounding the change from 18 (flexible) weeks to 12 (continuous) weeks. November/December 2016 likely contained many births conceived both before and after the March 2, 2016, conception cutoff date.

A.4 Online Appendix Tables

Table 6: Probability of leaving the Marines for all mothers by 6 or 12 months

	p(Leaves within 6 months)		*p*(Leaves within 12 months)	
	(1) OLS	(2) LASSO	(3) OLS	(4) LASSO
Unexpected +12 wks	0.012 (0.022)		-0.001 (0.028)	
Expected +12 wks	-0.001 (0.011)		-0.005 (0.015)	
Expected +6 wks	0.010 (0.012)		0.018 (0.021)	
Age	0.066*** (0.010)	0.058	0.100*** (0.015)	0.093
Age Squared	-0.001*** (0.000)	-0.001	-0.002*** (0.000)	-0.002
African American	-0.032** (0.012)	-0.021	-0.041* (0.019)	-0.033
Other	-0.014 (0.014)		-0.041* (0.020)	-0.031
Hispanic	-0.011 (0.011)		-0.039* (0.016)	-0.033
Previous number of Kids=1	0.041** (0.015)	0.001	0.054** (0.019)	
Previous number of Kids=2	0.026 (0.024)		0.077* (0.033)	
Previous number of Kids=3	-0.042 (0.031)	-0.049	-0.038 (0.052)	-0.052
Previous number of Kids=4	-0.022 (0.025)		0.143 (0.158)	
Previous number of Kids=5	0.454 (0.342)	0.339	0.381 (0.363)	0.062
Married	0.002 (0.011)		0.019 (0.017)	0.000
Divorced	0.030 (0.025)	0.020	0.092** (0.034)	0.068
Time in Service	0.018*** (0.004)	0.014	0.040*** (0.005)	0.037
Some College	0.012 (0.023)		-0.010 (0.030)	
College Degree	-0.044* (0.022)	-0.051	-0.050 (0.033)	-0.048
Armed Forces Qualification Test Score	0.001* (0.001)	0.001	0.001 (0.001)	0.001
General Classification Test Score	-0.001 (0.001)		0.000 (0.001)	
Observations	4107	4107	3654	3654
N of individuals	3648	3648	3273	3273
R-squared	0.076		0.125	
Control mean	0.098	0.098	0.216	0.216

Notes: Robust standard errors clustered by ID in parentheses. $^{+}p < 0.1$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$. Outcome is indicator for leaving by six or 12 months post-birth. Comparison group for leave policy is mothers who gave birth in December 2014 or earlier. Odd columns are linear probability models. Even columns instead use an adaptive LASSO model with 10-fold cross-validation to predict leaving, using deviance to minimize loss. N is larger for shorter duration because we can follow more people six months out than 12 months out at the end of the sample.

Table 7: Adaptive LASSO with 10-fold Cross-validation to Predict Birth

Mother group:	No imputation of leave		Imputation of leave	
Comparison group:	Females	Males	Females	Males
Intercept	-3.569	0.469	-2.769	0.920
Age	-0.075	-0.069	-0.109	-0.076
Black	.	0.492	.	0.528
Other	0.078	0.218	.	0.116
Hispanic	0.146	0.577	0.145	0.584
Prior # kids	0.869	1.800	0.890	1.917
Married	4.099	2.410	3.348	2.369
Divorced	1.775	3.404	1.750	3.278
Years of service	0.082	0.172	0.119	0.156
Some college	.	0.784	0.000	0.596
College	-1.467	-0.906	-1.144	.
AFQT	-0.004	0.025	-0.005	0.025
GCT	-0.008	-0.095	-0.007	-0.096
Age * age	.	.	.	.
Age * Black	.	.	.	.
Age * other	.	.	.	.
Age * Hispanic	.	.	.	.
Age * # kids	.	.	.	.
Age * married	-0.038	.	0.000	.
Age * divorced	.	.	.	.
Age * yrs service	.	.	.	.
Age * some col	.	.	.	.
Age * college	.	.	.	.
Age * AFQT	.	.	.	.
Age * GCT	.	.	.	.
Black * Hispanic	-0.242	-0.331	-0.207	-0.301
Black * # kids	.	-0.139	.	-0.081
Black * married	-0.200	0.010	-0.172	0.056
Black * divorced	-0.150	-0.191	-0.144	-0.138
Black * yrs service	.	.	.	-0.015
Black * some col	0.304	-0.289	0.201	-0.332
Black * college	-0.515	-0.545	-0.587	-0.604
Black * AFQT	.	.	.	.
Black * GCT	.	.	.	.

Notes: Table displays best coefficients from the adaptive LASSO with 10-fold cross-validation to predict having a baby, using deviance to minimize loss. Variables are the same as those used in the descriptive statistics, as well as all potential interactions, except for percent female in the MOS which could potentially be endogenous if pregnant women are moved to a new area. Sample includes either the sample of mothers with full data or the sample that adds the mothers with some imputation of maternity leave as well as (1) all females or (2) all males whom we do not observe adding a dependent baby to the home, who are not married to a military member, and who do not have a child under age one in their home. Positive signs indicate the variable (or interaction) is more likely among mothers than the comparison group, conditional on all other variables. The LASSO process dropped many variables (and interactions) from the model because they do not improve the bias/deviance trade-off.

Table 7. Adaptive LASSO with 10-fold cross-validation to predict birth (continued)

Mother group:	No imputation of leave		Imputation of leave	
Comparison group:	Females	Males	Females	Males
Other * Hispanic	-0.200	-0.085	-0.276	-0.171
Other * # kids	0.164	0.057	0.170	0.077
Other * married	-0.450	0.318	-0.312	0.469
Other * divorced	-0.511	0.288	-0.165	0.620
Other * yrs service	.	.	.	.
Other * some col	0.450	.	0.330	-0.077
Other * college	0.787	0.163	0.680	0.073
Other * AFQT	.	.	.	.
Other * GCT	.	.	.	.
Hispanic * # kids	0.093	.	0.095	.
Hispanic * married	-0.225	-0.251	-0.214	-0.266
Hispanic * divorced	0.016	-0.147	-0.156	-0.343
Hispanic * yrs service	.	.	0.003	0.007
Hispanic * some col	-0.352	-0.291	-0.439	-0.331
Hispanic * college	-0.324	-0.204	-0.271	-0.219
Hispanic * AFQT	.	.	.	.
Hispanic * GCT	.	.	.	.
# kids * # kids	-0.180	-0.274	-0.176	-0.270
# kids * married	-0.153	-1.235	-0.154	-1.318
# kids * divorced	.	-0.673	.	-0.789
# kids * yrs service	-0.050	-0.031	-0.050	-0.036
# kids * some col	0.164	-0.025	0.096	-0.056
# kids * college	0.492	.	0.457	0.082
# kids * AFQT	.	.	.	.
# kids * GCT	.	.	.	.
Married * yrs service	-0.015	-0.185	-0.064	-0.181
Married * some col	-0.049	-0.192	.	-0.071
Married * college	1.476	1.357	1.216	0.673
Married * AFQT	.	0.013	.	0.013
Married * GCT	.	.	.	.
Divorced * yrs service	-0.074	-0.240	-0.081	-0.231
Divorced * some col	.	0.513	0.063	0.600
Divorced * college	0.500	0.899	0.304	0.231
Divorced * AFQT	.	0.001	.	0.003
Divorced * GCT	.	.	.	.
Yrs service * yrs service	.	-0.001	.	0.000
Yrs service * some col	.	0.028	.	0.035
Yrs service * college	.	0.060	.	0.037
Yrs service * AFQT	.	.	.	.
Yrs service * GCT	.	.	.	.
Some col * AFQT	.	.	.	.
Some col * GCT	.	.	.	.
College * AFQT	.	.	.	.
College * GCT	.	.	.	.
AFQT * AFQT	.	.	.	.
AFQT * GCT	.	.	.	.
GCT * GCT	.	.	.	.

Table 8: Summary Statistics for Pre-birth Analysis Sample

	Mothers	All others		Matches	
	Main	All	F	M	F
Age	24.426	24.909	24.157	24.740	24.449
p	.	0.000	0.003	0.000	0.852
Black	0.172	0.109	0.156	0.184	0.168
p	.	0.011	0.013	0.104	0.722
Hispanic	0.264	0.184	0.253	0.282	0.278
p	.	0.007	0.157	0.047	0.326
Other	0.114	0.081	0.112	0.117	0.108
p	.	0.000	0.630	0.633	0.471
Officer	0.067	0.091	0.099	0.067	0.067
p	.	0.000	0.000	1.000	1.000
Warrant	0.008	0.011	0.008	0.008	0.008
p	.	0.105	0.740	1.000	1.000
Time_in_service	4.667	5.006	4.168	4.936	4.693
p	.	0.000	0.000	0.001	0.808
Pct_job_female	0.160	0.077	0.148	0.085	0.154
p	.	0.000	0.000	0.000	0.007
Married	0.733	0.354	0.315	0.754	0.731
p	.	0.000	0.000	0.008	0.852
Divorced	0.060	0.033	0.075	0.067	0.066
p	.	0.000	0.000	0.139	0.253
Prior_kids	0.346	0.346	0.193	0.368	0.300
p	.	0.000	0.000	0.058	0.006
Some_college	0.043	0.027	0.043	0.044	0.044
p	.	0.000	0.944	0.705	0.791
College	0.094	0.106	0.123	0.092	0.095
p	.	0.000	0.000	0.797	0.818
AFQT	59.319	64.731	63.184	58.509	59.310
p	.	0.012	0.000	0.014	0.986
GCT	102.819	110.154	105.449	102.890	102.857
p	.	0.000	0.000	0.752	0.906
Comparison		Main	Main	Main	Main
Gender		All	F	M	F
Observations	4,019	9,531,255	741,469	19,874	17,439
N of individuals	3,608	325,730	27,386	16,143	6,113
F-test	.	1675.85	106.63	5.26	1.10
p-value of *F*-test	.	0.000	0.000	0.000	0.354

Notes: Observation period is April 2013 (to allow three months pre-pregnancy to pass) to August 2018. Data all mothers observed, regardless of the quality of the maternity leave record-keeping, as chargeable leave was much more consistent. The mother column displays descriptive characteristics for the month of birth by birth event. The all others column displays descriptive characteristics with multiple observations per individual across months within all Marines not observed having a baby (All) and all female Marines not observed having a baby (All F). Match columns display descriptive characteristics for the month of the match to mothers for males we do not observe having a baby (M) and females we do not observe having a baby (F), weighted by match weights, and *p*-values indicate statistical difference relative to mothers using robust standard errors clustered by individual.

Table 9: Leave Types Used by Subgroups 12 Months Post-birth

	White (1)	Non-white (2)	Less F job (3)	More F job (4)	Less physical (5)	More physical (6)
A. Maternity leave						
Unexpected +12 wks	8.06***	8.70***	7.94***	8.72***	8.77***	8.07***
	(0.41)	(0.48)	(0.43)	(0.47)	(0.47)	(0.43)
Expected +12 wks	11.22***	10.96***	10.95***	11.20***	11.15***	11.03***
	(0.15)	(0.17)	(0.16)	(0.16)	(0.16)	(0.16)
Expected +6 wks	6.04***	6.07***	5.96***	6.12***	6.07***	6.06***
	(0.20)	(0.17)	(0.23)	(0.15)	(0.18)	(0.19)
Observations	1180	1244	1229	1194	1178	1246
p(diff, unexpected)		0.315		0.241		0.315
p(diff, expected +12)		0.336		0.265		0.622
p(diff, expected +6)		0.738		0.460		0.942
B. Chargeable leave						
Baby Appeared	0.62***	0.50***	0.72***	0.38***	0.63***	0.51***
	(0.11)	(0.12)	(0.11)	(0.12)	(0.12)	(0.11)
Baby × Unexpected +12 wks	-1.73***	-1.81***	-1.66***	-1.90***	-1.80***	-1.75***
	(0.23)	(0.27)	(0.23)	(0.28)	(0.28)	(0.23)
Baby × Expected +12 wks	-1.76***	-1.72***	-1.80***	-1.62***	-1.84***	-1.63***
	(0.16)	(0.15)	(0.15)	(0.16)	(0.16)	(0.15)
Baby × Expected +6 wks	-0.29	-0.65**	-0.29	-0.69***	-0.51**	-0.49*
	(0.20)	(0.20)	(0.21)	(0.20)	(0.20)	(0.21)
Observations	6430	6651	7217	5864	6174	6907
Comparison mean	3.110	3.253	3.103	3.285	3.225	3.146
p(diff, baby)		0.440		0.033		0.408
p(diff, baby × unexpected)		0.823		0.435		0.813
p(diff, baby × expected +12)		0.810		0.425		0.318
p(diff, baby × expected +6)		0.295		0.222		0.937
C. Pregnancy leave						
Baby Appeared	-0.03	-0.09*	-0.06^{+}	-0.07^{+}	-0.05	-0.07*
	(0.03)	(0.04)	(0.03)	(0.04)	(0.04)	(0.03)
Baby × 18 wks announced	-0.09	0.13^{+}	0.04	0.02	0.00	0.05
	(0.07)	(0.08)	(0.07)	(0.08)	(0.08)	(0.07)
Baby × 6 wks announced	-0.01	-0.04	0.02	-0.08	-0.01	-0.07
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Observations	10475	10976	11760	9687	9754	11695
Comparison mean	0.878	0.967	0.913	0.938	0.915	0.931
p(diff, baby)		0.164		0.777		0.644
p(diff, baby × 18 wks)		0.027		0.906		0.726
p(diff, baby × 12 wks)		0.800		0.324		0.515

Notes: Robust standard errors clustered by ID in parentheses. $^{+}p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
For each regression, the treated and reference groups are limited to the category indiacated by the column header. For Panel A, the first-differences reference group is moms who gave birth under the 6-week policy. For Panels B and C, the difference-in-dfferences reference group is the matched controls to females.

Table 10: Leave Usage by Choice-limited Sample

	Maternity leave		Annual leave		All leave	
	(1)	(2)	(3)	(4)	(5)	(6)
Baby Appeared	0.000	0.000	0.564***	0.560***	6.495***	6.490***
	(.)	(.)	(0.082)	(0.082)	(0.093)	(0.092)
Unexpected +12 wks	8.283***	8.390***	-1.778***	-1.775***	6.279***	6.288***
	(0.320)	(0.317)	(0.179)	(0.179)	(0.375)	(0.375)
Expected +12 wks	10.807***	10.607***	-1.832***	-1.822***	8.478***	8.339***
	(0.158)	(0.181)	(0.131)	(0.137)	(0.233)	(0.257)
Sample limitation	Pregnancy	Abortion	Pregnancy	Abortion	Pregnancy	Abortion
Match gender			F	F	F	F
Month FE	X	X				
Month-year FE			X	X	X	X
Rank group FE	X	X	X	X	X	X
Location FE	X	X	X	X	X	X
Job type FE	X	X	X	X	X	X
Observations	1,687	1,601	9,196	8,742	9,196	8,742
N of individuals	1,619	1,547	4,562	4,396	4,562	4,396
R-squared	0.829	0.820	0.182	0.186	0.819	0.808
Control mean			2.947	2.897	3.287	3.218
p(baby+unexpected)=0			0.000	0.000	0.000	0.000
p(baby+expected)=0			0.000	0.000	0.000	0.000

Notes: Robust standard errors clustered by ID in parentheses. $^{+}p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Outcomes indicated by column header. Reference groups: Models (1-2) are female Marines who gave birth during the 6-week maternity leave policy period and received 6-weeks of maternity leave; Models (3-6) are the matched group of females with no birth events. Even columns limited to time where the mother was pregnant before the policy announcement of the extended 18-week maternity leave; odd columns limited to time when probably abortion timing had already passed once the policy announcement of the extended 18-week leave had passed.