THE IMPACT OF FAMILY LEAVE LAWS ON CESAREAN DELIVERY

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ABSTRACT

Cesarean rates have increased dramatically over the past several decades. Currently, nearly a third of all births in the U.S. are delivered by cesarean section. Although numerous factors have contributed to this increase, this paper estimates the impact of state-level family leave laws on cesarean rates. Through their influence on insurance and relative leave length, leave laws can alter the incentives facing both parents and physicians to choose cesarean delivery. The impact of leave laws on cesarean rates is estimated using a difference-in-difference approach that exploits variation in state leave laws that existed prior to the passage of the federal Family and Medical Leave Act (FMLA) in 1993. The empirical results suggest that state leave laws are associated with a reduction in the probability of cesarean delivery among employed women, but have no impact on the probability of cesarean delivery among the nonemployed.

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1. INTRODUCTION

Cesarean rates have increased dramatically over the past several decades. Currently, nearly a third of all births in the U.S. are delivered by cesarean section.[1] As shown in Figure 1, the percentage of all births delivered by cesarean section increased from 5 percent in 1965 to 33 percent in 2010. The increase has prompted medical authorities including the American College of Obstetricians and Gynecologists (ACOG) and the National Institutes of Health (NIH) to voice concern about the high and increasing rate of cesarean delivery in the United States (ACOG 2000; NIH 1981). Both the U.S. Department of Health and Human Services (DHHS) and the World Health Organization (WHO) recommend a cesarean rate of 15 percent for low-risk women because there is little evidence that maternal and infant health are improved when cesarean rates exceed this level (DHHS 1990, 2000; WHO 1985, 1994).[2]

The increase in cesarean rates can be explained by myriad factors including increased maternal age, multiple births, rates of obesity and diabetes among mothers, changes in physician training, advances in technology, and changes in the financial incentives facing physicians. This paper seeks to identify whether the passage of family leave laws impacted cesarean delivery rates. Leave laws may affect the incentives of both physicians and mothers. *A priori*, the laws have theoretically ambiguous impacts. On the one hand, leave laws could *increase* cesarean rates

[1] The United States ranked fourth among 26 OECD countries in terms of cesarean rates in 2004, with a rate of 29 percent. Mexico, Italy, and Korea had higher cesarean rates than the United States (OECD 2007). The average cesarean rate among Latin America, the Caribbean, and East Asia was estimated at 26 percent in 2006. The average cesarean rate for the developing world was estimated at 12 percent (Stanton and Hotz 2006).

[2] A low-risk female is defined as one with a full-term (at least 37 weeks) singleton (not a multiple pregnancy) vertex fetus (head facing in a downward position in the birth canal). In 2003, the cesarean rate among low-risk women was 24 percent, compared to 28 percent for all women (NCHS 2005).

because they include provisions regarding insurance coverage that provide incentives at the margin for physicians and mothers to deliver by cesarean. Previous research suggests that physicians and mothers are sensitive to insurance coverage in their decisions regarding method of delivery, with cesarean rates highest among privately insured patients, followed by those on Medicaid and the uninsured (Grant 2005; Gruber et al. 1999; Keppel et al. 1982; Stafford 1990, 1991).

However, prior to the passage of the leave laws, employers often granted relatively longer leaves for cesarean delivery (typically eight instead of six weeks of leave) (Riley, 2006). Consequently, the laws may *decrease* cesarean rates because they establish uniform leave provisions and could effectively eliminate additional time-off for cesarean delivery. Increased access to leave could also decrease cesarean rates if the laws lead to more women taking leave prior to the birth, thus making them in some way healthier at the time of delivery (i.e., lower levels of stress, lower blood pressure, less time on their feet, etc.) and less likely to deliver by cesarean.

Prior to the passage of the federal Family and Medical Leave Act (FMLA) in 1993, a number of states passed leave laws granting parents time off of work for the birth of a child. To estimate the impact of leave laws on cesarean rates, we utilize a quasi-experimental framework, in which the change in the probability of giving birth by cesarean among women in states that passed leave laws is examined relative to the change in the probability of cesarean among women in the states that did not pass leave laws. [3] If family leave laws impacted cesarean

[3] We focus on state-level leave laws rather than the FMLA for two reasons. First, since the FMLA potentially impacts women in all states simultaneously, it would be difficult to identify an adequate control group against which to test FMLA impacts. Second, the NSLY (the data source we use for our estimates) switched from annual to biennial surveying beginning in 1994.

choices by mothers and physicians, the probability of cesarean should move differently in states that passed leave laws.

The empirical results suggest that the state leave and insurance laws do affect the incentives of mothers or their physicians for delivery by cesarean section and are consistent with the predicted effects on mother and physician incentives. The specific effect of the law differs by the length of the leave period, with laws guaranteeing shorter leave lengths associated with larger reductions in the likelihood of cesarean delivery while laws guaranteeing longer leaves are associated with increased probabilities of cesarean delivery. Additionally, laws that require continuation of insurance coverage are associated with increased cesarean rates.

As a check on our results, we compare changes in the probability of cesarean delivery among nonemployed women, since employment leave laws should not impact the delivery choice among the nonemployed. We find no evidence that leave laws impact cesarean choices among this group. Similarly, laws guaranteeing insurance coverage are not estimated to affect employed women who had not previously been insured. This suggests that the results are unlikely to be driven by endogeneity of laws.

2. FAMILY LEAVE LAWS

Prior to the passage of the federal Family and Medical Leave Act (FMLA) in 1993, 22 states had some form of a law granting time off work for maternity disability (disability due to pregnancy, miscarriage, childbirth, or recovery that substantially limits work activities), maternity leave (leave granted to female employees for the birth and care of a new baby), or

parental leave (leave granted to both male and female employees for the birth and care of a new baby) for private sector employees.[4]

Table 1 provides a state-by-state description of the laws, all of which provided job-protected leave, guaranteeing the employee his or her job back at the end of the leave period. The laws varied primarily in terms of the timing of their passage, the length of leave guaranteed, and requirements regarding the continuation of health insurance coverage during leave.

Some states (e.g., CO, IL, and WA between 1973 and 1989) passed laws requiring that employers grant employees a "reasonable period" of leave, but did not include a specific leave length guarantee. Other states (e.g., CA, MA, and WA after 1989) passed laws specifying the number of weeks of leave to be granted. Among the 15 states that specified the leave length, some states (e.g., WI, IA, and MN) guaranteed relatively short leave lengths of 13 weeks or less, while others (e.g., CA, LA, and CT after 1991) guaranteed leave lengths of 16 weeks or more. A total of nine states passed leave laws requiring that health insurance coverage continue during the leave (e.g., MN, RI, and TN).

Table 2 summarizes the attributes of the state laws that we use in the empirical analysis. Column 1 identifies states and years with any form of leave law covering private sector employees, regardless of whether the law included a specified leave length or only required a "reasonable period" of leave (*any leave law*). Column 2 identifies states and years with leave laws that specified the length of leave to be granted, along with the length of the leave (*length-*

[4] A number of states also passed leave laws that applied only to public sector employees. We focus here only on leave laws that impact private sector. Regressions that include a control for public sector laws (available from the authors) yield similar results to those presented here.

specified leave law). The code "L" in column 2 denotes relatively long leave lengths (16 or more weeks), and the code "S" denotes relatively short leave lengths (13 or fewer weeks).[5]

Column 3 identifies states and years with leave laws that require that insurance coverage continue through the leave period (*insurance law*). Each of these states' laws also granted a specified number of weeks for leave (i.e., every state that had a requirement that insurance coverage continue also had a specified leave length in its statute). However, not every state that passed a length-specified leave law also included an insurance provision, allowing us to disentangle the impact of insurance provisions from the impact of length-specified leave laws.

3. BACKGROUND AND THEORETICAL FRAMEWORK

This paper focuses on the choice by the patient and physician to undertake a cesarean birth. Overall, there is not conclusive medical evidence supporting one delivery method over the other (NIH 2006), and for many mothers the delivery method is indeed a choice. Meikle et al. (2005), for example, find that U.S. rates of elective primary cesarean delivery increased from 20 percent of all primary cesarean deliveries in 1994 to 28 percent in 2001, which translates into approximately 166,000 elective cesarean deliveries in 1994 and 274,000 in 2001.[6] Using international data, researchers have found that 14 to 22 percent of all elective cesareans are maternal choice cesareans (Ryding 1991; Tranquilli and Garzetti 1997; Eftekhar and Steer 2000; Schindl et al. 2003; Kolas et al. 2003; Tranquilli and Giannubilo 2004; and Wiklund et al. 2007). In addition, researchers have found that 40 to 85 percent of physicians report that they would

[5] No states passed laws with mandated leave of 14 or 15 weeks.
[6] A primary cesarean delivery is a cesarean delivery by a woman who has not previously had a cesarean delivery.

perform a non-medically indicated cesarean if requested to do so by the mother (Bergholt et al. 2004; Bettes et al. 2007; Wax et al. 2005).[7]

Although there are many reasons why women and doctors choose one form of delivery over another (e.g., medical factors and medical technology, convenience, fear, personal preference), we focus here on the potential impacts that leave laws have on this choice.[8] We hypothesize that these impacts occur primarily via differential financial incentives for physicians and differential financial and length of leave impacts for mothers in states with leave laws in place. As we describe below, from the physician's perspective, we hypothesize that leave laws' provisions regarding insurance coverage generate net increases in incentives for cesarean delivery. From the patient's perspective, we hypothesize conflicting impacts of the laws on cesarean rates.

3.1 Physician Incentives

Beginning with Arrow's (1963) work, the agency relationship that exists between physicians and patients has been a popular research topic within the health economics literature. To the extent that physicians act as agents to uninformed patients, they may have incentives to "induce demand" for their services since they both diagnose and recommend treatment (Dranove 1988; Fuchs 1978; Gruber and Owings 1996), although this behavior is potentially kept in check

[7] Ghetti et al. (2004), however, estimate that only 2 to 20 percent would do so based on their survey of physicians in Portland, Oregon.

[8] See Tussing and Wajtowycz (1992) regarding medical determinants of cesarean delivery; Shiono et al. (1987) regarding changes in medical technology associated with cesarean delivery; Tussing and Wojtowycz (1992) and Marieskind (1979) regarding physicians' increased tendency to deliver by cesarean to minimize the risk of being sued in the event of a poor birth outcome; and McFarlin (2004), Miesnik and Reale (2007), Penna and Arulkumaran (2003), and Feinman (2002) regarding women's preferences for cesarean because it feels "safer."

by reputation effects (e.g., Gruber and Owings 1996; Kim 2007; Higgins 1985; Goldfarb 1985; Rock 1988).

One channel through which leave laws may impact physicians' incentives in this agency relationship is through the requirement that health insurance coverage continue through the leave period. Although we have found no studies that directly examine the impact of state leave laws on insurance coverage, in its study of the FMLA, the Commission on Family and Medical Leave (1996) found that the number of firms offering continuation of health insurance benefits during the leave period did increase as a result of the FMLA. Of the firms covered by the FMLA, 96 percent continued health benefits when leave was taken to care for a newborn or for maternity disability. Of the firms not covered by the FMLA, only 73 percent continued health benefits when leave was taken to care for a newborn and only 86 percent continued health benefits when leave was taken for maternity disability. Although the report focuses specifically on the FMLA, it offers suggestive evidence of the potential impact of the state leave laws on insurance coverage.

With more mothers covered by private insurance after the passage of leave laws, physicians may respond by performing more cesareans on women who would have been uninsured or insured by a less generous insurance plan without the laws' passage. Indeed, several researchers have found that physicians appear to be more likely to perform cesareans on privately insured women, likely due to the higher fee differential paid by private insurance relative to other types of insurance or the uninsured (Grant 2005; Gruber et al. 1999; Haas et al. 1993; Keppel et al. 1982; Keeler and Brodie 1993; Stafford 1990, 1991).[9]

[9] Physicians may also have incentives to deliver by cesarean in cases where labor is taking a long time or extending into the night (Evans et al. 1984; Phillips et al. 1982; Fraser et al. 1987; Penna and Arulkumaran 2003; Keeler and Brodie 1993), but we see no role for leave laws to alter this outcome.

3.2 Patient Incentives

Leave laws generate important changes, in both directions, in the incentives for a woman to choose a particular delivery method. As is the case with physicians, insurance coverage changes implied by the laws would be associated with increased cesarean sections at the margin. The impact of the laws' job-protected leave guarantees is more complex, as we discuss below.

3.3 Insurance coverage and labor induction

Although a cesarean delivery costs, on average, several thousand dollars more than an uncomplicated vaginal delivery, the extra expense of a cesarean delivery over a vaginal delivery to an insured mother is relatively small, since only about 11 percent of the total charges for maternity care are paid out-of-pocket and since charges for even a vaginal delivery generally meet the out-of-pocket maximums of the typical insurance policy (Gold et al. 1987; Keeler and Brodie 1993). Nonetheless, leave laws' guarantee of insurance coverage could move women on the margin toward the choice of cesarean delivery, as its additional expense is now more likely to be covered.

It is unlikely that cesarean delivery is preferred to vaginal delivery for scheduling or convenience reasons, as both can be planned in advance and scheduled for a convenient time and date, with vaginal delivery aided by labor induction medication.[10] However, Luthy et al. (2004) and Heffner et al. (2003) find that induction of labor increases the risk of cesarean delivery by between 50 and 70 percent. Thus, if leave laws' guarantee of health insurance coverage generates increases in induction rates, they may have an indirect positive impact on cesarean rates.

[10] The NCHS (2007) reports that rates of induction of labor increased from 10 percent in 1990 to 23 percent in 2005, a 138 percent increase.

3.4 Leave Guarantees

The provision of job-protected leave has potential conflicting impacts on patients' delivery choice incentives through its impact on patients' ability to recover from cesarean and to take leave before the birth, and through its impact on the relative length of leave given to mothers who deliver by cesarean.

Research indicates that recovery from cesarean delivery takes longer than for vaginal delivery, that this difference persists until at least three weeks postpartum, but that differences in recovery largely disappear within two months of giving birth (Tullman et al. 1990; DiMatteo et al. 1996; Tullman and Fawcett 1988; Lydon-Rochelle et al. 2001; McGovern et al. 2006, 2007; Gjerdingen et al. 1991; and DiMatteo 1996). With the passage of leave laws, women on the margin between the two delivery methods may have become more likely to prefer, or at least not oppose, cesarean delivery because they were guaranteed time off to accommodate the longer recovery period required for cesarean. In addition, physicians may have become more inclined to perform cesareans, knowing that women had leave to accommodate the longer recovery. This may be especially salient in states with long leave guarantees, while women in states with short leave laws may have been less affected by this channel.

Alternatively, prior to the passage of leave laws, employers that made maternity leave available to employees often granted six weeks of leave for vaginal delivery and eight weeks of leave for cesarean delivery (Riley 2006). Ceteris paribus, the longer leave length for cesarean delivery provides incentives at the margin for mothers to choose a cesarean delivery in order to have more time at home with their newborn. By specifying uniform leave lengths irrespective of the form of delivery, the leave laws may have had the unintended consequence of eliminating

this additional time off of work for cesarean births. As a result, mothers may have become less likely to prefer cesarean delivery. Again, the impact of uniform leave lengths is likely to differ depending on whether the laws guarantee long or short leaves. If, for example, the typical mother would prefer to take 12 weeks of leave if she had a vaginal delivery, but 14 weeks of leave if she had a cesarean delivery, a law guaranteeing 16 weeks of leave (i.e., a long leave law) would not alter her delivery choice. However, a law guaranteeing only eight weeks of leave (i.e., a short leave law) would eliminate the additional time off traditionally given for caesarian deliveries. Thus, if the standardization of leave lengths reduces incentives for cesarean delivery, the effect is likely to be bigger in states and years with short leave laws, since those laws impose a tighter constraint on additional time off relative to states and years with long leave laws.[11]

A decline in cesarean rates is also plausible if women increased their taking of leave *prior to* the birth and as a result, are in some way healthier and less likely to require a cesarean. For example, a woman who begins her leave the week prior to her due date may be less stressed, have lower blood pressure, and spend less time on her feet than if she had otherwise not taken the week off before her due date. Thus, she may have become less likely to require a cesarean because she had access to leave.[12]

In sum, the insurance component of leave laws may generate increased incentives for physicians and mothers to undertake cesarean deliveries. The impact of the leave length guarantees associated with the laws are likely mixed. The leave guarantees can ensure adequate recovery time from cesarean, which may increase its utilization, especially in long leave states.

[11] The literature on how leave laws impacted the incidence of leave taking and the length of leave has produced mixed results. Although some researchers have found that the passage of leave laws led to increased leave taking, taking longer leaves, and increased likelihood of returning to the pre-birth employer (Waldfogel 1998, Berger and Waldfogel 2004; Baum (2003b) Han et al. 2007; Ross 1998; Glass and Riley 1998), other researchers (Klerman and Leibowitz (1997) and Bond et al. (1991), found no significant impact of the laws on leave taking among mothers.

[12] We know of no research that has focused on leave taking before birth and its impact on cesarean rates.

Alternatively, if the laws eliminate leave time premiums for cesarean deliveries, they may reduce incentives for this form of delivery, especially in short leave states. Increased leave taking prior to delivery in all states may reduce cesarean section rates, leaving the net effect ambiguous. We present below a difference-in-difference approach to tease out the impacts of these potential effects.

4. EMPIRICAL FRAMEWORK

To estimate the impact of leave laws on cesarean rates, we use a difference-in-difference approach where cross-state variation in state leave laws is utilized to compare outcomes for women in states with leave laws against their counterparts without these laws in their states. In particular, we estimate regressions of the form

$$(1) \qquad CSECT_{itj} = f(\alpha + \beta_1 anylaw_{itj} + \gamma_1 X_{itj} + \gamma_2 Z_{itj} + \gamma_3 S_j + \gamma_4 T_t + \varepsilon_{itj}),^{13}$$

where, *CSECT* is equal to one if child *i* was delivered by cesarean section in year *t* in state *j*, and zero otherwise, *anylaw* is equal to one if the child was born in a state and year when a leave law was in effect, and zero otherwise, as denoted by the "any leave law" column in Table 2. X is a vector of birth, demographic, and health characteristics of child *i*, and Z is a vector of demographic, health, and economic characteristics of child *i's* mother. Finally, S is a set of state indicator variables, T is a set of year indicator variables, and ε is an error term.

Variables in X include whether the child was born by cesarean delivery, the weight of the child at birth, and an indicator for whether the child was born low birth weight (less than 5.5

[13] We obtain estimated coefficients from linear probability models. Probit estimates are qualitatively and quantitatively similar but result from fewer observations due to perfectly predicted outcomes in some cells. These results are available from the authors.

pounds). X also includes whether the mother had prenatal care during the first three months of the pregnancy, the weeks of gestation of the child at delivery, whether the child was female, the birth order of the child, whether the child was part of a multiple birth, and an indicator for whether the mother had experienced a previous cesarean delivery.

Variables in Z include the race of the mother, the age and education level of the mother at the time of the birth, the body mass index of the mother before and after delivery, the mother's marital status during the year of birth, an indicator for whether the mother had a health condition that limited the kind of work she could do during the year of the birth, the unemployment rate in the local labor market in the year of the birth, the real family annual income in the year before the birth, and the Armed Forces Qualification Test (AFQT) score of the mother.[14,15] When we focus the analysis on employed women, Z also includes indicators for the mother's occupation and industry in the birth year, the mother's earnings in the quarter before the pregnancy began, an indicator for whether the mother worked full time in the quarter before the birth of the child, and whether or not the mother's employer offered health insurance.

Finally, the vectors S and T represent state and year indicator variables that are included in all regressions. The S variables control for any permanent differences among states that may impact both the probability of cesarean delivery and the existence of a leave law in the state. The T variables control for time trends in cesarean rates across states. The standard errors are corrected for heteroskedasticity and are clustered on state of birth.[16]

[14] All dollar amounts were converted to their real (2004) values using the CPI-U.

[15] The AFQT percentile score (scores range from 1 to 99) is a measure of intelligence and was measured in 1980 for the NLSY survey respondents.

[16] For an explanation of standard error clustering in the context of difference-in-difference estimation, see Bertrand, Duflo, and Mullainathan (2004).

The impact of leave laws on cesarean rates is captured by β_1, which measures the change in the probability that a child is delivered by cesarean in states that passed leave laws (the "treatment states") relative to the change in the probability that a child is delivered by cesarean in states that did not pass leave laws (the "comparison states"). The estimate of β_1 will be positive if women in states that passed leave laws experience a relatively larger increase in the probability of cesarean delivery relative to those in states that did not pass the laws, consistent with the idea that the leave laws generate an increase in cesarean sections via increased insurance coverage, induction of labor (and corresponding cesarean sections), or increased ability to take leave for the longer cesarean delivery recovery time. The estimate of β_1 will be negative if laws generate a relative decrease in cesareans, consistent with either the laws reducing the differential leave incentive previously provided to women delivering by cesarean or with the increased access to leave somehow making women healthier and less likely to require a medically necessary cesarean.

Because we hypothesize differential impacts of the laws based on their variation in leave length and insurance coverage, we also allow the law variables to enter our estimating equation with varying specifications. In particular, we can assess the impact of leave length guarantees by including separate indicators for laws' leave length. We do this in equation (2) (where we eliminate subscripts for ease of readability).

$$(2)\quad CSECT = f(\alpha + \beta_1 rplaw + \beta_2 longlaw + \beta_3 shortlaw + \gamma_1 X + \gamma_2 Z + \gamma_3 S + \gamma_4 T + \varepsilon),$$

Where *longlaw* and *shortlaw* correspond to laws guaranteeing 16 or more weeks of leave, and 13 or fewer weeks of leave, respectively, and *rplaw* identifies laws that specify only a

"reasonable period" of leave. (Recall that no states specified leave periods of 14 or 15 weeks.) The coefficient β_2 captures the impact of laws guaranteeing 16 or more weeks of leave, β_3 captures the impact of laws guaranteeing 13 or fewer weeks of leave, all relative to states without leave law provisions.

In order to identify the impacts of the insurance coverage provisions of leave laws, we also estimate specifications that include an indicator for these laws, as in equation (3).

(3) $CSECT = f(\alpha + \beta_1 rplaw + \beta_2 longlaw + \beta_3 shortlaw + \beta_4 insurancelaw + \gamma_1 X + \gamma_2 Z + \gamma_3 S + \gamma_4 T + \varepsilon)$,

where *insurancelaw* identifies states and laws that include insurance continuation provisions in addition to leave length guarantees, and β_4 captures these laws' impacts.

Finally, if leave laws are endogenous, our regressions would simply pick up the effect of some other factor that is correlated with both the state's passage of a leave law and the probability of cesarean delivery. We check against this concern by estimating our regressions separately for a sample of nonemployed mothers. Because leave laws are designed to provide a mechanism for employed mothers to take maternity leave from their jobs, we would not expect the laws to have an impact on the delivery choices of nonemployed mothers. Indeed, we find no effects of the law on the nonemployed in any of our specifications. Similarly, women who did not have insurance offered by their employer at the time of the birth should not be affected by laws guaranteeing insurance coverage, and again the results find no impact of the laws on these mothers.

A final set of regressions estimates the effect of parental leave laws. These are available in only a few states. We hypothesize that parental leave may affect the incentives of married women to give birth by cesarean, but the direction of the effects of these laws is unclear. On the one hand, having a spouse who can take employment leave to help with newborn care during recovery may lead to increased probability of cesarean section. On the other hand, access to parental leave may allow parents to stagger their leaves across time and thus eliminate the differential leave incentive previously provided to women delivering by cesarean. In addition, the insurance provision guarantees extend to husbands in states with parental leave laws, leading to increased probability of cesarean, particularly for nonemployed mothers, who are more likely to rely on their spouse's insurance coverage.

5. DATA

In addition to the law data documented in Tables 1 and 2, the data used in the empirical analysis come primarily from the National Longitudinal Survey of Youth (NLSY). The NLSY is a nationally representative panel that began in 1979 with a sample of respondents between the ages of 14 and 21. These respondents were interviewed annually until 1994 and biennially afterward. Because using the biennial data would not accurately account for changes in marriage or other characteristics of mothers in between-sample years, we limit our sample to the pre-FMLA period 1980-1992.[17]

The NLSY includes information on labor market, demographic, and health characteristics, as well as on the children born to NLSY women. For each child, detailed information about the birth is available, including whether the child was delivered by cesarean.

[17] We do not include births in 1979 in order to include data on mothers' characteristics in the year prior to the birth for 1980 births.

We supplement the NLSY data with the NLSY Geocode data, which allows for identification of the state of birth of the child.

We exclude from the sample any observations with missing values for any of our variables, a small number of births (< 5) that were reported to occur before 20 weeks gestation, any births to mothers who report working in the public sector, being self-employed, working for a family business, or working for no pay, and all observations state-year cells with fewer than eight births.[18]

Because we are interested in employment leave and have concern about insurance coverage (which is generally restrictive regarding preexisting conditions), we limit the sample of employed women to those who were employed during the quarter before the pregnancy began (i.e., during the 13 week the period four quarters before the birth of the child). Labor market information also includes mothers' usual hours of work and real earnings during the quarter before the pregnancy began.

Descriptive statistics for the employed and nonemployed samples are reported in Table 3. Our sample includes 1,120 births by employed women and 1,253 births by nonemployed women. Twenty nine percent of the births in our employed sample occurred in state-years that were covered by any family leave law. Of these, 22 percent were covered by a law that specified the leave length and five percent were covered by a law that also required insurance coverage continuation during the leave. Twenty-six percent of the births in the employed sample were delivered by cesarean, compared to 21 percent of the births in the nonemployed sample. Not

[18] This restriction drops births in AK, DE, DC, HI, ID, IA, KS, ME, NV, NH, ND, RI, SD, UT, VT, WY in all years, plus a few state-year cells with fewer than eight births. We also estimated our regressions while restricting the sample to exclude state-year cells with fewer than five births; our results were qualitatively similar to those presented here, but were less robust across specifications.

surprisingly, mothers in the employed sample were more likely to have had prenatal care during the first trimester of pregnancy and were less likely to be on their second or later birth.

6. EMPIRICAL RESULTS

We estimate the impacts of the laws using the regressions described by equations (1) through (3), and allowing for the differential leave law specifications described in Table 2. The estimated coefficients on the law variables are presented in Tables 4 through 7 and the estimated coefficients for the control variables are presented in Appendix Table A1.

Turning first to the control variables, previous cesarean delivery is a strong predictor of current cesarean delivery and the probability of cesarean delivery declines for higher order births. Mothers with higher BMI at delivery are more likely to deliver by cesarean section, while those with lower BMI just before pregnancy are slightly less likely to deliver by cesarean section. The estimated coefficients on other control variables are statistically significant.

Table 4 presents estimates of equation (1) for the sample of employed mothers. Children born in states with any maternity leave law are six percentage points less likely to be delivered by cesarean than children born in states without such laws, although the significance level is marginal. Births in states with laws guaranteeing a specified length of leave are nine percentage points less likely to be by cesarean, while births in states that specify a "reasonable period" of leave do not have significantly different probabilities of a cesarean section.

The impacts of the laws differ markedly depending on the length of leave guaranteed by the laws. Births in states and years that were guaranteed long leaves were more likely to be by cesarean than births in states without leave laws, although this effect is only significant when controlling for laws guaranteeing insurance coverage. In contrast, births in states that guaranteed

shorter length leaves were between 14 and 24 percentage points less likely to be cesarean births. These results are consistent with the hypothesis that by specifying relatively short uniform leave lengths, short leave laws eliminated the additional time off of work associated with cesarean delivery, moving mothers at the margin away from preference for a cesarean birth. Longer guaranteed leave, in contrast, increases the utilization of cesarean delivery, perhaps because the longer period ensures adequate recovery time. Finally, guaranteed insurance coverage also led to a 16 percentage point increase in the probability of a cesarean birth, consistent with the hypothesis that the insurance provision of the laws provides incentives for patients, doctors, or both, to deliver by cesarean.

Table 5 presents estimates of the impacts of the insurance coverage provisions and the long and short leave specifications for employed and nonemployed mothers. (Results for employed mothers differ from Table 4 because the Table 5 results do not include the employment-based control variables to ensure consistency with the results for nonemployed women.) Because the leave laws are designed to provide employment leave guarantees for working mothers, we would not expect the laws to impact the nonemployed. Indeed, in none of our specifications are leave laws associated with changes in the probability of cesarean delivery among the nonemployed. The results in Table 5 reduce the concern that leave laws are endogenous and that the regression results in Table 4 are simply picking up the effect of some other factor that is correlated with both the state's passage of a leave law and the probability of cesarean delivery.

Table 6 presents the results for a parallel experiment based on insurance status. The NLSY data only include information on employer provided insurance. Table 6 therefore compares the effect of leave laws and the insurance law on insured and non-insured employed

women. Sample sizes for non-insured employed women are smaller (only 254 births), resulting in larger standard errors. As before, both insured and uninsured employed women have a higher probability of a cesarean section in long leave states, and a lower probability of a cesarean section in short leave states, although the point estimate for non-insured women is smaller in magnitude and statistically insignificant. Women who have insurance provided by their employer are 13 percentage points more likely to give birth by cesarean delivery when the state guarantees insurance coverage; non-insured women in these states show no change in their probability of this form of delivery. This makes it very unlikely that the effects of the extended insurance coverage are being driven by other statewide factors.

Finally, some states have parental leave policies as well as maternal leave policies. Tables 7 and 8 present estimates of the effect of parental leave laws on the form of delivery for married and unmarried women, again based on employment status of the mother. Table 7 focuses on nonmarried mothers, while Table 8 focuses on married mothers. Not surprisingly, parental leave laws have no impact on the probability of cesarean delivery among the nonmarried, regardless of employment status.

Among married mothers, the impact of parental leave laws differs among the employed and the nonemployed. Among employed mothers, parental leave laws have no significant impact on the probability of cesarean delivery. Among the nonemployed, the estimates indicate that parental leave laws are associated with reduced probability of cesarean, consistent with the idea that access to parental leave may allow parents to stagger their leaves across time and thus eliminate the differential leave incentive previously provided to women delivering by cesarean. In addition, the insurance provision guarantees extend to husbands in states with parental leave

laws, leading to increased probability of cesarean, particularly for nonemployed mothers, who are more likely to rely on their spouse's insurance coverage.

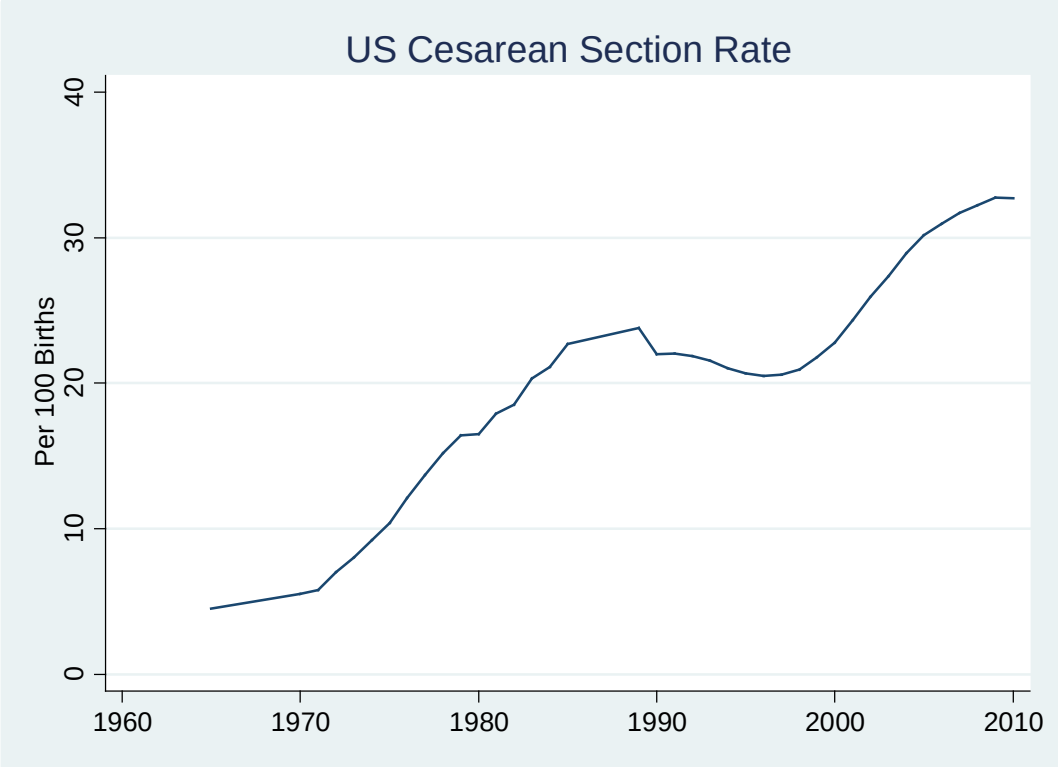
9. CONCLUSION

Rates of cesarean delivery have increased dramatically since 1965, with nearly a third of all current births in the U.S. being delivered by cesarean. Previous research has attempted to explain this trend in cesarean rates by examining clinical and medical factors, maternal requests for cesarean delivery, and the financial incentives surrounding delivery. This paper contributes to previous research by estimating the impact of state leave laws on cesarean delivery. Theoretically, the predicted impact of the leave laws on cesarean rates is ambiguous, as leave laws led to increased health insurance coverage during leave and altered incentives provided by longer leaves associated with caesarean births.

The empirical evidence presented in this paper suggests that state leave laws do impact the incentives of mothers or their physicians in deciding on the method of delivery. Empirical results suggest that state leave laws guaranteeing long leaves (16 or more weeks) increased the probability of cesarean delivery by roughly 17 percentage points. Laws that guaranteed shorter leaves (and perhaps eliminated "bonus" time off routinely given to mothers who deliver by cesarean) decrease the probability of cesarean delivery by between 14 and 24 percentage points. Controlling for whether a state passed a length-specified leave law, laws that guarantee insurance coverage as associated with a 16 percentage point higher probability of cesarean delivery. We find no evidence that leave laws had an impact on the probability that nonemployed mothers delivered by cesarean or that insurance laws affected the incentives of non-insured women. We find that parental leave laws have no impact on the probability of cesarean delivery among

nonmarried mothers or employed mothers, but are associated with decreased probability of cesarean delivery among married, nonemployed mothers.

Figure 1. Cesarean Section Rates for the United States



Sources: Center for Disease Control, National Vital Statistics.

Table 1: Detailed Description of State-Level Maternity Leave Laws

State	Year	Leave Period	Insurance	Law Type	Statute/Code	Source(s)
California	1980	16 weeks	No	M,MD	§12945	Baum, Lenhoff & Becker, NPWF, Waldfogel, WB
	1991	16 weeks	Yes	P	§12945.2	Baum, Irvin & Silberman, Kane, MLR (1992), NPWF, WB
Colorado	1988	RP	No	M	§80.8(d)	BNA, State Law Website, WB
Connecticut	1973	RP	No	M,MD	§46a-60	Baum, BNA, MLR (1974), Waldfogel, WB, Lenhoff & Becker
	1990	12 weeks	No	P		Baum, Irvin & Silberman, MLR (1989)
	1991	16 weeks	No	P	§31-51	MLR (1989), Kane, NPWF, WB
District of Columbia	1991	16 weeks	Yes	P		Baum, Irvin & Silberman, Kane, MLR (1990), NPWF, Waldfogel, WB
Hawaii	1983	RP	No	M,MD	§12-23-1; §12-23-58	BNA, HI Civil Rights Commission, Kane, Lenhoff & Becker, WB
Illinois	1985	RP	No	M,MD	§2.10; §5210	BNA, State Law Website
Iowa	1987	8 weeks	No	M,MD	HB 86; §216:6:2; §601A	BNA, Kane, Lenhoff & Becker, MLR(1988), WB
Kansas	1972	RP	No	M,MD	§21-32-6	BNA, State Law Website, WB, Irvin & Silberman, NPWF
Louisiana	1987	16 weeks	No	M,MD	§23:1008; §23:341	MLR (1988), NPWF, WB, Kane
Maine	1988	8 weeks	Yes	P,MD		Baum, Lenhoff & Becker, MLR (1989), Irvin & Silberman, Kane, Waldfogel
	1991	10 weeks	Yes	P	§843-845; §843-849	MLR (1991), NPWF, WB
Massachusetts	1972	8 weeks	No	M	§4.11A, §3.02 (7), §8.01	Baum, BNA, Irvin & Silberman, Kane, MLR (1973), NPWF, Waldfogel, WB
Minnesota	1987	6 weeks	Yes	P	§181.940-942	Baum, BNA, Irvin & Silberman, WB, Waldfogel

Table 1 (continued): Detailed Description of State-Level Maternity Leave Laws

State	Year	Leave Period	Insurance	Law Type	Statute/Code	Source(s)
Montana	1984	RP	No	M,MD	§49-2-310; §24.9.1201	BNA, Irvin & Silberman, Kane, State Law Website, WB
New Hampshire	1987	RP	No	M,MD	§1001(b); §354-A:9; §402.03; §201.01	BNA, Lenhoff & Becker
	1992	RP	No	M,MD	§ 354-A:7	NPWF, State Law Website, WB
New Jersey	1990	12 weeks	No	P	§ 34:11B-1	Baum, Irvin & Silberman, Kane, MLR (1991), Waldfogel, WB
Ohio	1989	RP	No	M,MD	§ 4112-5-05	Kane, State Law Website
Oregon	1988	12 weeks	No	M, P	§ 659.010, § 659.360,§ 659.389, § 659.560	Baum, BNA, Irvin & Silberman, Kane, MLR (1988), NPWF, Waldfogel
Rhode Island	1987	13 weeks	Yes	P	§ 28-48-1, § 28-5-38	Baum, BNA, Irvin & Silberman, Kane, Lenhoff & Becker, MLR (1988), NPWF, Waldfogel, WB
Tennessee	1988	16 weeks	Yes	M	§ 4-21-408	Baum, BNA, Irvin & Silberman, Kane, Lenhoff & Becker, MLR (1988), NPWF, Waldfogel, WB
Vermont	1989	12 weeks	Yes	M	§ 471-472	MLR(1990)
	1992	12 weeks	Yes	P	§ 470-472	Baum, Irvin & Silberman, Kane, NPWF, WB
Washington	1973	RP	No	M, MD	§ 162-30-020(5)	Baum, BNA, State Law Website, Waldfogel
	1989	12 weeks	Yes	P	§ 49.78.020-.030	Baum, Irvin & Silberman, Kane, MLR (1990), NPWF, WB
Wisconsin	1988	6 weeks	Yes	P	§ 103.10	Baum, Irvin & Silberman, Kane, Lenhoff & Becker, MLR (1989), NPWF, Waldfogel

Key: States without private sector maternity leave laws by 1993 are not listed. RP= reasonable period of leave; P= Parental Leave; M= Maternity Leave; MD= Maternity Disability. For states where no date was listed by some researchers or if the date was not consistent across researchers, we consulted the state law website, state law library, and/or the state department in charge of the law to obtain the date the law was passed.

Key to Sources: Baum = Baum (2003a); Waldfogel = Waldfogel(1998); BNA= Bureau of National Affairs; MLR= Monthly Labor Review; NPWF= National Partnership for Women and Families; WB= Women's Bureau.

Table 2: Coding of State Maternity Leave Laws

	1	2	3	4
State	**Leave Law with or without Length of Leave Specified (*any leave law*)**	**Leave Law with Length of Leave Specified (*length-specified leave law*)**	**Leave Law with Insurance Provision (*insurance law*)**	**Parental Leave Law**
CA	1980	1980 L(16)	1991	1991
CO	1988			
CT	1973	1990 S(12); 1991 L(16)		1990
DC	1991	1991 L(16)	1991	1991
HI	1983			
IL	1985			
IA	1987	1987 S(8)		
KS	1972			
LA	1987	1987 L(16)		
ME	1988	1988 S(8)	1988	1988
MA	1972	1972 S(8)		
MN	1987	1987 S(6)	1987	1987
MT	1984			
NH	1987			
NJ	1990	1990 S(12)		1990
OH	1989			
OR	1988	1988 S(12)		1988
RI	1987	1987 S(13)	1987	1987
TN	1988	1988 L(16)	1988	
VT	1989	1989 S(12)	1989	1992
WA	1973	1989 S(12)	1989	1989
WI	1988	1988 S(6)	1988	1988

Key: States without private sector maternity leave laws by 1993 are not listed. *Any leave law*: Year state passed a maternity leave law, regardless of whether a specific period of leave was granted or whether the state included only a "reasonable period" of leave. *Length-specified leave law*: Year state passed a law granting a specified number of weeks of leave; L = leave length ≥16 weeks; S = leave length ≤ 8 weeks; M = leave length 12 or 13 weeks; numbers in parentheses indicate number of weeks granted by law. *Insurance law*: Year state passed a law that required that health insurance coverage continue during the period of leave. Note that each of these states' laws also granted a specified number of weeks for leave (i.e., every state that had a requirement that insurance coverage continue also had a specified leave length in its statute). *Parental leave law*: Year state passed a law granting a specified number of weeks for parental leave (i.e., both males and females included) to employees in the private sector.

Table 3: Summary Statistics

	1 Employed		2 Nonemployed	
	Mean	**SD**	**Mean**	**SD**
State Leave Law Characteristics				
Any leave law	0.29	0.45	0.25	0.43
Reasonable period of leave law	0.08	0.27	0.05	0.21
Length-specified leave law	0.22	0.41	0.20	0.40
Long leave law (≥16 weeks)	0.17	0.37	0.18	0.38
Short leave law (≤13 weeks)	0.06	0.23	0.03	0.16
Insurance law	0.05	0.22	0.02	0.15
Parental leave law	0.06	0.24	0.02	0.15
Birth and Child Characteristics				
Cesarean delivery	0.26	0.44	0.21	0.41
Weight of child (ounces)	117.79	21.11	116.91	21.81
Born low birth weight	0.08	0.26	0.08	0.28
Had prenatal care by 3 months	0.87	0.34	0.77	0.42
Gestation (weeks)	38.53	2.21	38.68	2.14
Child female	0.50	0.50	0.49	0.50
Birth order	1.58	0.80	2.02	1.09
Multiple birth	0.02	0.13	0.03	0.16
Previous cesarean delivery	0.10	0.31	0.11	0.31
Mother's Characteristics				
AFQT percentile score	47.30	27.24	33.19	26.87
Age (year of birth)	25.86	3.58	23.85	3.98
BMI just before pregnancy	23.25	4.62	22.92	4.45
BMI just before delivery	28.70	4.80	28.28	4.80
White	0.56	0.50	0.46	0.50
Black	0.21	0.41	0.27	0.44
Hispanic	0.16	0.36	0.19	0.39
Other race/ethnicity	0.08	0.26	0.08	0.27
Less than high school education	0.11	0.31	0.36	0.48
High school education only	0.43	0.50	0.38	0.48
Some college	0.25	0.43	0.18	0.38
BA or more education	0.21	0.41	0.08	0.27
Married (year of birth)	0.78	0.42	0.59	0.49
Health limits kind of work mother can do (year of birth)	0.10	0.30	0.12	0.33
Unemployment rate in local labor market (%, year of birth)	7.71	3.27	8.55	3.49
Real family annual income ($000s, year before birth)	64.82	113.18	38.31	85.32
Working full time (4th quarter before birth)	0.83	0.37	-	-
Real own wage and salary income ($000s, 4th quarter before birth)	5.87	3.93	-	-
Employer offers health insurance (year of birth)	0.77	0.42	-	-
Number of observations	1,120		1,253	

Table 4: Effect of Leave Laws on Probability of Caesarian Section

Dependent variable = 1 if birth was by caesarian section

	1	**2**	**3**	**4**
Any leave law	-.056	--	--	--
	(1.41)			
Reasonable period leave law	--	-.027	-.025	-.023
		(0.65)	(0.58)	(0.54)
Length-specified leave law	--	-.086*	--	--
		(1.91)		
Long leave law (≥16 weeks)	--	--	.111	.171***
			(1.57)	(3.60)
Short leave law (≤13 weeks)	--	--	-.138***	-.242***
			(3.57)	(11.64)
Insurance law	--	--	--	.156***
				(3.68)
R-squared	.291	.291	.292	.294
Industry and Occupation Controls	Y	Y	Y	Y
State-fixed effects	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y
Number of observations	1,120	1,120	1,120	1,120

Table reports estimated coefficients from linear probability models of caesarian section birth for employed mothers. Probit estimates are qualitatively and quantitatively similar but result from 27 fewer observations due to perfectly predicted outcomes in some cells (results available from authors). All regressions include a constant and all the controls for birth and child characteristics and mother's characteristics listed in Table 3 (estimated coefficients for these variables are in the appendix). Absolute values of t-statistics are reported in parentheses; standard errors are clustered at the state level.

* p-value <0.10; ** p-value <0.05; *** p-value<0.01 (two-tailed tests)

Table 5: Effect of Leave Laws for Employed and Nonemployed Mothers

Dependent variable = 1 if birth was by caesarian section

	1	**2**	**3**	**4**	**5**	**6**
	Employed	Nonemployed	Employed	Nonemployed	Employed	Nonemployed
Any leave law	-0.057	-0.047	--	--	--	--
	(1.42)	(-0.75)				
Reasonable period leave law	--	--	-0.027	-0.117	-0.024	-0.114
			(0.57)	(1.43)	(0.53)	(1.37)
Long leave law (≥16 weeks)	--	--	0.141*	0.027	0.194***	0.031
			(1.92)	(0.80)	(3.74)	(1.13)
Short leave law (≤13 weeks)	--	--	-0.142***	0.013	-0.232***	-0.033
			(3.84)	(0.19)	(7.25)	(0.44)
Insurance law	--	--	--	--	0.135***	0.062
					(2.83)	(1.20)
R-squared	0.278	0.354	0.279	0.356	0.281	0.356
State-fixed effects	Y	Y	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y	Y	Y
Number of observations	1,120	1,253	1,120	1,253	1,120	1,253

Table reports estimated coefficients from linear probability models of caesarian section birth for employed and nonemployed mothers. Probit estimates are qualitatively and quantitatively similar but result from fewer observations due to perfectly predicted outcomes in some cells (results available from authors). All regressions include a constant and all the controls for birth and child characteristics and mother's characteristics listed in Table 3, with the exception of *working full time, real own wage and salary income,* and *employer offers health insurance*, which are not included in any specifications in this table. Estimated coefficients for the control variables are in the appendix. Absolute values of t-statistics are reported in parentheses; standard errors are clustered at the state level.

* p-value <0.10; ** p-value <0.05; *** p-value<0.01 (two-tailed tests)

Table 6: Effect of Leave Laws for Insured and Noninsured Employed Mothers
Dependent variable = 1 if birth was by caesarian section

	1	**2**	**3**	**4**
	Insured	Noninsured	Insured	Noninsured
Reasonable period leave law	.002	-.177*	.005	-.180
	(0.03)	(1.74)	(0.08)	(1.70)
Long leave law (≥16 weeks)	.138*	.176	.203***	.176
	(1.95)	(0.93)	(3.11)	(0.92)
Short leave law (≤13 weeks)	-.151**	-.085	-.241***	-.055
	(2.56)	(0.52)	(5.68)	(0.52)
Insurance law	--	--	.132**	-.040
			(2.77)	(0.31)
Industry and Occupation Controls	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y
State fixed effects	Y	Y	Y	Y
R-squared	.296	.508	.297	.508
Number of observations	866	254	866	254

Table reports estimated coefficients from linear probability models of caesarian section birth for employed and nonemployed mothers. Probit estimates are qualitatively and quantitatively similar but result from fewer observations due to perfectly predicted outcomes in some cells (results available from authors). All regressions include a constant and all the controls for birth and child characteristics and mother's characteristics listed in Table 3. Estimated coefficients for the control variables are in the appendix. Absolute values of t-statistics are reported in parentheses; standard errors are clustered at the state level.
* p-value <0.10; ** p-value <0.05; *** p-value<0.01 (two-tailed tests)

Table 7: Effect of Leave Laws for Nonmarried Mothers
Dependent variable = 1 if birth was by caesarian section

	1	**2**
	Employed	Nonemployed
Reasonable period leave law	-.118	-.067
	(-1.04)	(0.97)
Length-specified leave law	.152	-.075
	(1.01)	(1.15)
Parental leave law	-.008	-.050
	(0.04)	(0.59)
R-squared	.288	.373
Number of observations	248	516
Year fixed effects	Y	Y
State fixed effects	Y	Y

Table reports estimated coefficients from linear probability models of caesarian section birth. Probit estimates are qualitatively and quantitatively similar but result from fewer observations due to perfectly predicted outcomes in some cells (results available from authors). All regressions include a constant and all the controls for birth and child characteristics and mother's characteristics listed in Table 3, with the exception of *working full time, real own wage and salary income*, and *employer offers health insurance*, which are not included in any of the specifications.
[a] For the nonmarried, *insurance law* is perfectly collinear with *parental leave law* and is thus not identified for the employed sample; *insurance law* is identified from too few observations (N=3 cesarean sections) to produce robust estimates for the nonemployed sample. Results are available from the authors.
* p-value <0.10; ** p-value <0.05; *** p-value<0.01 (two-tailed tests)

Table 8: Effect of Leave Laws for Married Mothers
Dependent variable = 1 if birth was by caesarian section

	1	**2**	**3**	**4**
	Employed	Nonemployed	Employed	Nonemployed
Reasonable period leave law	-.011	-.173*	.004	-.172*
	(0.20)	(-1.96)	(0.07)	(1.95)
Length-specified leave law	-.168**	.133***	-.165**	.151***
	(2.35)	(2.99)	(2.53)	(3.65)
Parental leave law	.076	-.090*	.101	-.516***
	(1.08)	(1.78)	(0.95)	(6.37)
Insurance law	--	--	-.034	.434***
			(0.36)	(5.07)
R-squared	.314	.391	.302	.392
Number of observations	872	737	872	737
Year fixed effects	Y	Y	Y	Y
State fixed effects	Y	Y	Y	Y

Table reports estimated coefficients from linear probability models of caesarian section birth. Probit estimates are qualitatively and quantitatively similar but result from fewer observations due to perfectly predicted outcomes in some cells (results available from authors). All regressions include a constant and all the controls for birth and child characteristics and mother's characteristics listed in Table 3, with the exception of *working full time*, *real own wage and salary income*, and *employer offers health insurance*, which are not included in any of the specifications.
* p-value <0.10; ** p-value <0.05; *** p-value<0.01 (two-tailed tests)

Table A1: Estimated Coefficients on Control Variables

	1 Employed		2 Employed		3 Nonemployed	
	Coeff.	**t-stat**	**Coeff.**	**t-stat**	**Coeff.**	**t-stat**
Birth and Child Characteristics						
Weight of child (ounces)	-0.01	1.38	-0.01	1.49	-0.01	1.03
Weight of child-squared	0.00	1.54	0.00	1.65	0.00	0.96
Born low birth weight	0.07	0.81	0.04	0.53	0.03	0.55
Had prenatal care by 3 months	-0.04	1.27	-0.04	1.14	0.03	1.08
Gestation (weeks)	0.00	0.93	-0.01	0.84	0.00	0.59
Child female	0.01	0.33	0.01	0.48	-0.03**	2.33
Birth order	-0.11***	5.65	-0.11***	5.91	-0.09***	7.19
Multiple birth	0.05	0.33	0.04	0.26	0.22***	4.69
Previous cesarean delivery	0.64***	12.14	0.66***	12.97	0.66***	17.58
Mother's Characteristics						
AFQT percentile score	-0.00*	1.82	-0.00*	1.92	0.00	1.06
Age (year of birth)	0.01	1.04	0.01	1.42	0.01	1.31
BMI just before pregnancy	-0.01*	1.84	-0.01	1.52	-0.01*	1.88
BMI just before delivery	0.02***	3.48	0.01***	3.12	0.01***	4.18
White	-0.01	0.22	-0.02	0.27	-0.01	0.24
Black	-0.03	0.40	-0.02	0.39	-0.02	0.32
Hispanic	0.01	0.38	0.01	0.19	-0.06	1.67
High school education only	0.05	1.15	0.05	1.18	-0.01	0.21
Some college	0.05	1.22	0.05	1.01	-0.01	0.18
BA or more education	0.10*	2.00	0.08*	1.76	0.00	0.07
Married (year of birth)	0.03	1.09	0.04	1.36	-0.02	0.75
Health limits kind of work mother can do (year of birth)	0.01	0.38	0.02	0.64	0.02	0.54
Unemployment rate in local labor market (%, year of birth)	0.00	0.25	0.00	0.34	0.00	0.71
Real family annual income ($000s, year before birth)	0.00	0.07	0.00	0.43	0.00	0.70
Working full time (4th quarter before birth)	0.00	0.25	--		--	
Real own wage and salary income ($000s, 4th quarter before birth)	0.00	1.08	--		--	
Employer offers health insurance (year of birth)	0.04	1.00	--		--	
Number of observations	1,120		1,120		1,253	

Column 1 reports estimated control variable coefficients and absolute values of t-statistics from the regression reported in Table 4 column 4. Columns 2 and 3 report estimated control variable coefficients from the regressions reported in Table 5 columns 5 and 6, respectively.

* p-value <0.10; ** p-value <0.05; *** p-value<0.01 (two-tailed tests)

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