

THE IMPACT OF MANDATORY DELAY LAWS ON FERTILITY OUTCOMES

JOB MARKET PAPER

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This paper analyzes the effects of mandatory delay laws for abortions on the fertility decisions of women in the U.S. In 1992, the U.S. Supreme Court ruled that mandatory delay laws are constitutional, reversing a previous ruling. Consequently, 24 states have adopted laws which require women to wait a specified period of time before obtaining an abortion. States provide counseling to women during the waiting period, and the type of counseling varies across states. Using state-level panel data, I find mandatory delay laws are associated with a five to six percent reduction in abortion rates. The adoption of mandatory delay laws is positively related to births, but has no effect on pregnancy rates. Since pregnancy rates are unaffected, I further test the effect of mandatory delay laws and counseling requirements on the decision to have an abortion or give birth, controlling for pregnancy. My results show that pregnant women are five percent less likely to choose abortion in states with mandatory delay laws and almost twenty percent less likely in states with the most stringent counseling requirements.

Key words: Abortion; Mandatory Delay; Fertility

JEL Categories: I18, J13

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1. Introduction

The U.S. Supreme Court ruling in *Roe v. Wade* (1973) legalized abortion yet still gave states the right to restrict abortion access (P. Levine 2004). States began adopting laws restricting abortion access as early as the end of the decade. Prohibiting the use of Medicaid funds to pay for an abortion procedure (1973) and requiring minors to either obtain consent from a guardian or to inform them of their decision prior to obtaining an abortion (1973) were the earliest and most common restrictions passed across states (P. Levine 2004). States began adopting mandatory waiting periods for abortion in 1992 following the U.S. Supreme Court decision in *Planned Parenthood of S.E. Pennsylvania v. Casey* (P. Levine 2004). Mandatory delay laws vary by state but typically women receive counseling concerning the procedure and are then required to wait 24 hours before they can obtain an abortion (T. J. Joyce, et al. 2009). Between 1992 and 2005, 22 states passed mandatory delay laws, and the overall abortion rate fell by 29 percent.

Mandatory delay laws have generated substantial controversy in and out of the court system. Opponents of the laws claim waiting periods unnecessarily increase the burden for abortions while proponents claim the laws allow women to make a more informed decision (Richardson and Nash 2006, New 2008). A major point of contention among advocacy groups is the counseling requirements associated with mandatory delay laws (Richardson and Nash 2006, New 2008). Counseling requirements vary across states, and some requirements have been criticized as biased. For instance, some states require in-person counseling, thereby increasing the number of visits to the provider. Some states include information stating that a link between breast cancer and abortion exists, the fetus can feel pain after a certain amount of weeks of gestation, and/or post-procedure negative emotional distress is associated with abortion.

Although contentious debate exists over mandatory waiting periods, current literature suggests the laws have little to no effect on abortion rates (Bitler and Zavodny 2001, P. Levine 2002, Medoff 2007, Wind 2009). The purpose of this paper is to conduct a comprehensive analysis of mandatory delay laws on fertility in the U.S. This research provides several extensions to the current literature. First, I estimate the impact of the laws in conjunction with several counseling requirements. Second, I analyze the full effect of the law by testing the effects on abortion, birth, and pregnancy. Third, I test the effects of the mandatory delay laws on the decision to have an abortion, controlling for pregnancy. Finally, I extend my data to 2005, while in the existing literature the samples end during the late 1990s. This allows me to analyze twice the number of state law changes than has been previously studied, in order to better capture the effects of the law changes.

Mandatory delay laws could increase the financial and emotional costs of abortion by increasing expenses and stress. The change to the cost of abortion would vary across states depending on the waiting period requirements. An increase in the cost to abortion would be expected to reduce abortion rates. However, the effect on births is ambiguous. Birth rates may rise if pregnant women choose not to have an abortion because of the waiting period and/or counseling received. However, birth rates could decline because women may choose greater contraception, thereby reducing pregnancies.

I construct a state-level panel on abortions, births, and pregnancies, and the timing of restrictions across states, in order to identify the effects of mandatory delay laws on the fertility decisions of women in the U.S. In this paper, I find support for several conclusions regarding mandatory delay restrictions. Panel regressions reveal that mandatory delay laws are associated with a reduction in abortion rates. Approximately three percent of the overall decline in abortion

rates since the first law was adopted is attributed to mandatory delay laws. Mandatory delay laws are also shown to increase birth rates, but they have no effect on pregnancy rates. Since pregnancy rates are unaffected, I further examine the decision of whether to terminate a pregnancy by estimating a logit model that examines the binary choice of abortion or birth, conditional upon being pregnant. Mandatory delay laws reduce the probability that women choose abortion. The effect on the probability of abortion is magnified when combined with certain counseling requirements.

2. Background

2.1. Legal Background

Mandatory delay laws have generated much controversy in and out of the court system. In 1983, the U.S. Supreme Court ruled in *City of Akron v. Akron Center for Reproductive Health* an Ohio law requiring a 24-hour waiting period to be unconstitutional because its intent was to dissuade women from having abortions when not medically necessary (P. Levine 2002, P. Levine 2004). In a 5 to 4 vote, the U.S. Supreme Court ruled in *Planned Parenthood of S.E. Pennsylvania v. Casey* (1992) that mandatory delay laws do not violate the rights set forth in *Roe v. Wade* (1973) (P. Levine 2004, Richardson and Nash 2006). The ruling legalized any restrictions that did not impose “undue burden,” defined as a “substantial obstacle in the path of a woman seeking an abortion before the fetus attains viability” (P. Levine 2004). States began passing mandatory delay laws in August of the same year (P. Levine 2004, T. J. Joyce, et al. 2009). To date, 24 states have passed laws requiring women to delay having an abortion for a specified period of time after the initial contact (Guttmacher Institute 2009, T. J. Joyce, et al. 2009).

The heated debate surrounding mandatory delay laws extends beyond the U.S. Supreme Court. The primary point of debate concerns additional requirements and the information provided to women during the waiting period, such as information about the procedure, status of the fetus, and post-procedure emotional and physical expectations (T. J. Joyce, et al. 2009). Proponents of the law claim mandatory delay laws and counseling allow women to make a more informed decision regarding their options (New 2008, National Right to Life Committee 2009). Opponents of the law claim women are given counseling which is biased and medically ungrounded with the intent to dissuade them from having an abortion (Center for Reproductive Rights 2006, Richardson and Nash 2006).

States require women to receive counseling during the waiting period before obtaining an abortion (Guttmacher Institute 2009). Some states require the counseling to be done in person, meaning an additional visit to the provider. Other states allow women to access materials through the mail, phone, fax, or internet, as long as it is done in advance. In addition to the visit requirements, states generally provide information about the procedure and alternatives to abortion (Guttmacher Institute 2009). Three particular types of information that have been criticized as biased are information that suggests the fetus can feel pain, that suggests a possible link between abortion and breast cancer, and that suggests there is a possibility of increased depression and negative emotional stress after having an abortion (Center for Reproductive Rights 2006, Richardson and Nash 2006, NARAL: Pro-Choice America 2009).

2.2. Theoretical Background

Models of fertility follow Becker and others and assume women make rational decisions about fertility by weighing the costs and benefits.¹ Restrictions to abortion should raise the cost of having an abortion and, therefore, reduce the number of abortions. The financial and emotional costs of having an abortion would differ among states that have mandatory delay laws due to varying state counseling requirements. For example, in-person counseling requirements mandate that women make two visits to the provider which would increase the indirect costs to having an abortion. Also, some information may also make the decision more stressful and increase the emotional costs to abortion.

Requiring two visits to the clinic raises the financial cost of having an abortion by increasing travel costs and forgone wages (Lupfer and Silber 1981, T. J. Joyce, et al. 2009). Many states have few providers, requiring out-of-town travel to obtain an abortion. A 24-hour waiting period which requires in-person counseling may cause these women to pay for overnight accommodations as well. The two-visit requirement could also increase the emotional costs associated with abortion because in-person counseling may be more stressful than getting materials online, and wading through protestors on multiple occasions could cause additional stress. Thus, states with in-person counseling requirements are expected to have lower abortion rates than states that allow counseling via fax, phone, internet, or mail, *ceteris paribus*.

Other state requirements may also increase the emotional costs to having an abortion. For instance, some counseling includes information of a possible link between abortion and breast cancer. In addition, women with a history of depression may be deterred from having an abortion because of information stating women are more likely to experience depression, guilt, and

¹ See Kane and Staiger (1996), Levine (2002), Levine and Staiger (2002), and Medoff (2002) for theoretical models with abortion restrictions. See Montgomery and Trussel (1986) for an overview of models of fertility.

overall negative emotional distress after an abortion procedure. Including information about fetal pain is also likely to deter some women from having the procedure. Thus, states with mandatory delay laws that have more stringent counseling requirements are expected to have lower abortion rates.

Mandatory delay laws increase the cost of unwanted pregnancies by increasing the cost of abortion. Increases in the cost of pregnancy should lead to increased contraceptive use and a decrease in the number of pregnancies. The effect of mandatory delay laws on births is, therefore, ambiguous. Births could increase because women who are already pregnant may decide not to have an abortion. However, births could decrease due to a decline in pregnancies from increased contraceptive use.

3. Existing Literature

Extensive research exists on the effects of abortion legalization and abortion restrictions on abortion, birth, and pregnancy in the U.S. (Blank, George and London 1996, Haas-Wilson 1996, Kane and Staiger 1996, Levine, Trainor and Zimmerman 1996, Levine, Staiger and Kane, et al. 1999, Bitler and Zavodny 2001, P. Levine 2002, P. Levine 2003). The majority of the literature on abortion laws focuses on restrictions to Medicaid funding and parental involvement laws. States with legal constraints to Medicaid do not permit the use of Medicaid funds to pay for abortions, thereby increasing the direct financial cost for women of low income. Most studies find that Medicaid funding restrictions decrease the overall abortion rate with estimates ranging from a 9 to 25 percent decline (Blank, George and London 1996, Haas-Wilson 1996, Levine, Trainor and Zimmerman 1996).² Medicaid funding restrictions are found to have either no effect

² Bitler and Zavodny (2001) find no effect of Medicaid funding restrictions on the timing of abortion and some evidence of an increase in total abortions.

or a slight negative effect on births, implying a reduction in pregnancies (Kane and Staiger 1996, Levine, Trainor and Zimmerman 1996). States with parental involvement laws require minors to obtain parental consent or to inform a parent of their decision before obtaining an abortion. Some studies show parental involvement laws decrease abortion rates for minors by about 13 to 25 percent (Haas-Wilson 1996, P. Levine 2002, 2003). Other studies find no effect of parental involvement laws on total abortion rates for all women (Blank, George and London 1996, Bitler and Zavodny 2001, P. Levine 2003).³ Studies states with parental involvement laws have lower teenage birthrates attributed to lower pregnancy rates (Kane and Staiger 1996, P. Levine 2002, 2003).⁴

Medicaid funding and parental involvement laws are restrictive to particular groups of the population, women with low-income or minors. Mandatory delay laws are unique because they change the financial and emotional costs for all women seeking an abortion in states with these requirements. The first mandatory delay law passed in 1992, much later than the first Medicaid funding and parental consent laws. Due to the more recent nature of mandatory delay restrictions, the impact of these laws has not been widely studied. Initial research on the effects of mandatory delay laws on fertility focused on Mississippi, the first state to adopt the law (Althaus and Henshaw 1994, Joyce, Henshaw and Skatrud 1997, Joyce and Kaestner 2000, Joyce and Kaestner 2001). The overall abortion rate declined in Mississippi after the law was passed (Althaus and Henshaw 1994, Joyce, Henshaw and Skatrud 1997). However, Mississippi's

³ Bitler and Zavodny (2001) find no effect on total abortion rates, but an increase in later-term abortions. Thus, women delay having an abortion when these laws are in place.

⁴ Levine (2002) and Levine (2003) show parental consent laws resulted in increased contraceptive use among minors which is consistent with the reduction in pregnancies.

mandatory delay law led to an increase in out-of-state and second trimester abortions (Joyce and Kaestner 2000, Joyce and Kaestner 2001).⁵

Subsequent research on these restrictions uses state-level panel data with state and year fixed effects and state-specific time trends (Bitler and Zavodny 2001, P. Levine 2002, Medoff 2007). The current literature finds no effect of mandatory delay laws on state abortion, birth, or pregnancy rates (Bitler and Zavodny 2001, P. Levine 2002, Medoff 2007).⁶ However, mandatory delay laws are found to increase the rate of later-term abortions. (Bitler and Zavodny 2001). Mandatory delay restrictions were not the primary focus of these state-level analyses. To my knowledge, the current literature does not estimate the effects of mandatory delay laws by counseling requirements.

This paper extends the literature in several ways. First, I show how the effects of mandatory delay laws differ by state requirements for counseling because much of the debate surrounding mandatory delay laws disputes counseling requirements. Second, I am able to show the full effect of the laws on fertility by analyzing abortions, births, and pregnancies. Third, I show how mandatory delay laws affect the decision to have an abortion or give birth, controlling for pregnancies. Using state-level data to model this decision has the advantage of reporting accuracy since research shows individuals underreport abortion in surveys. Finally, I am able to capture additional variation in mandatory delay laws. The majority of the literature on mandatory delay laws end their samples prior to 1997 (Bitler and Zavodny 2001, P. Levine 2002) or use

⁵ Previous research shows no effect of South Carolina's one-hour waiting period on out-of-state or second trimester abortions (Joyce and Kaestner 2001)

⁶ Levine (2002) finds births and pregnancies rates decline with state and year fixed effects, but no effect of mandatory delay laws on either outcome with state trends.

decennial data (Medoff 2007).⁷ Twelve additional states pass mandatory delay laws between 1997 and 2005. Thus, my analysis exploits twice the variation in state law includes state law changes than the current literature.

4. Data

I construct a state-level panel from 1976 to 2005 to analyze the effects of mandatory delay laws.⁸ Data on state abortion restrictions including mandatory delay, parental involvement, and Medicaid funding laws were obtained from Bitler and Zavodny (2001), Levine (2004), Americans United for Life (2008), and the Alan Guttmacher Institute (AGI). Table 1 defines the data and sources used in this analysis.

Data on the major legislative actions in reproductive health across states are from AGI. This information allows me to identify counseling visit and information requirements for each state. Visit requirements include in-person counseling or counseling that is received via mail, fax, phone, or internet. Information requirements include information on post-procedure negative emotional distress, fetal pain, or a link between breast cancer and abortion. I chose these requirements because they have been accused of being biased or medically ungrounded (Center for Reproductive Rights 2006, Richardson and Nash 2006).⁹

The AGI and the Center for Disease Control (CDC) are the two main sources of state abortion rates in the literature. I use state abortion rates from the CDC for this analysis because the CDC reports annual abortion rates which allows me to fully exploit the variation in law changes across states and years. At least one state adopts a mandatory delay law in almost every

⁷ Medoff (2007) uses decennial data for 1980, 1990, and 2000. Using 30 years of annual data, I am able to better capture the variation in the laws.

⁸ The latest year of data available through the CDC's Abortion Surveillance System is 2005.

⁹ See Guttmacher Institute (2009) for a complete list of state counseling requirements.

year between 1992 and 2005. The AGI only reports abortion rates for half of these years. The CDC collects the number of abortions per year from health departments and surveys while the AGI collects information directly from abortion providers. Unfortunately, the CDC may not include information from smaller clinics and could understate the number of abortions (Blank, George and London 1996, Center for Disease Control (CDC) 2003).¹⁰

The abortion rate is defined as the number of abortions per 1,000 women of childbearing age (15 to 44) in the population, henceforth called fertile women (Blank et al., 1996). Figure 1 presents the abortion rate per 1,000 fertile women for all states in my sample from 1976 to 2005. The figure also includes the abortion rate per 1,000 fertile women in comparison and reform states. A state is in the comparison group if they do not adopt mandatory delay laws at any time during my sample. A state is in the reform group if they adopt mandatory delay laws at any time in the sample. The graph shows reform states have lower abortion rates. Wolfers (2006) argues that pre-existing trends in the outcome variable could produce incorrect estimates when analyzing policy changes. Beginning my sample in 1990 would predate the reform, but it will be difficult to determine the effect of the law changes from pre-existing trends in abortion rates. Figure 1 shows abortion rates began to decline around 1980, but the first mandatory delay law did not pass until 1992. Therefore, I begin my sample in 1976, prior to the downward trend in abortion rates that began around 1980.

Birth rates are defined as the number of births per 1,000 fertile women in each year and state. Following Levine et al. (1996), I define the pregnancy rate as the sum of abortion and birth rates

¹⁰ In fact, the abortion rates reported from the CDC is 16.93 and from the AGI is 20.25 per 1,000 women aged 15 to 44 in the population during the available years of data from the AGI.

for each year and state.¹¹ I also estimate the decision between choosing abortion or birth for women who are already pregnant using a logit model. In this model, the probability of having an abortion is the proportion of pregnancies that result in abortion or the number of abortions divided by the number of pregnancies. Likewise, in this model, the probability of birth is the number of births divided by the number of pregnancies.

Time-varying state controls which may be correlated with abortion rates and mandatory delay laws are also included. Specifically, I include a covariate measuring the number of hospital beds per million people and the number of physicians per 1,000 people in the population to control for abortion access.¹² I also control for the political environment of the state by including the percent of women in the state legislature. Other controls include the marriage rate, the female labor force participation rate, the unemployment rate, state per capita income, and state maximum AFDC or TANF benefits. State population estimates are also used as controls including the population of females aged 15 to 19, 20 to 24, 25 to 34, and 35 to 44 as well as the percent of females that are white and the percent that are black. I use state population of females aged 15 to 44 to weight the regressions.

5. Estimation Methodology

The estimation relies on cross-state and cross-time variation in the timing of laws in order to identify the effects of mandatory delay restrictions on fertility outcomes. During my sample period, 22 states adopt waiting period restrictions. The timing of mandatory delay reform was likely not in response to changes in fertility outcomes but rather in response to a Supreme Court

¹¹ It is possible that the rate of miscarriages changes over time. See Levine et al. (1996) for additional discussion on the problem of pregnancy losses.

¹²Blank et al. (1996) show that abortion providers may be endogenous to the abortion rate. Therefore following Levine (1996) and Bitler and Zavodny (2001), I include the physician rate and hospital bed rate to control for abortion access in the state.

decision because prior to the ruling in *Planned Parenthood of S.E. Pennsylvania v. Casey* (1992) mandatory delay laws were deemed unconstitutional (P. Levine 2004).

Multivariate regression analysis is used to capture the effect on fertility outcomes such as state-level abortion rates, birth rates, and pregnancy rates as well as the probability of abortion. The following equations are used to capture the effect of mandatory delay restrictions to abortion access on fertility outcomes:

$$Y_{st} = \text{Mandatory Delay}_{st}\beta_1 + R_{st}\beta_2 + X_{st}\beta_3 + \gamma_s + \gamma_t + \text{trend} * \gamma_s + \epsilon_{st}. \quad (1)$$

Subscripts s and t index states and years, respectively. Y represents the logged values of state-level fertility outcomes: abortion, birth, and pregnancy rates. Y also represents the probability of choosing abortion over giving birth in subsequent estimations. *Mandatory Delay* is an indicator variable for whether a state has mandatory delay restrictions. *Mandatory Delay* is replaced with interaction terms for mandatory delay laws with certain counseling requirements in subsequent estimations. R is a vector of indicator variables for other abortion restrictions. X is a vector of time-varying state controls such as state population demographics, economic conditions and the state political environment. γ_s is a vector of state fixed effects, γ_t is a vector of year fixed effects, and $\gamma_s * \text{trend}$ is a vector of state-specific linear time trends. State fixed effects would capture anything specific to a state that does not change over time which is not already accounted for, such as the religious environment. State-specific linear time trends are included to capture state-specific unobserved changes over time, such as demographic changes which could be correlated with abortion rates.

Table 2 provides summary statistics for all outcome variables. Columns 2 and 3 of Table 2 present the summary statistics for states with and without mandatory delay restrictions. Nearly

70 percent of states with mandatory delay laws allow counseling to be received via mail, phone, fax, or internet whereas fewer than 30 percent require counseling to be received in person. Slightly over half of the states with mandatory delay laws also include at least one counseling requirement. The simple averages show that states with mandatory delay laws in place are more likely to have parental consent and Medicaid funding restrictions compared to states without mandatory delay laws. The table also shows the average abortion rate is much lower in states that have mandatory delay laws. Birth rates are very similar between states with and without the restriction while pregnancy rates are lower in states with mandatory delay laws. The proportion of pregnancies that result in abortion is also lower in states with mandatory delay restrictions.

6. Results

6.1. Abortion Rates

Table 3 presents the results of mandatory delay laws on abortion rates using state, time-varying controls, state and year fixed effects, and state-specific linear trends.¹³ The effect of mandatory delay laws on abortion rates is negative and significant. The results shows mandatory delay laws reduce abortion rates by 5.88 percent. I test the joint inclusion of state-specific linear trends using an F test. The F-statistic is 21.30. Therefore, the joint inclusion of state-specific linear trends is significant, and my preferred model specification includes state, time-varying controls, state and year fixed effects, and state-specific linear time trends.

Table 3 also presents the estimates for other restrictions on abortion rates due to the interest in the literature of these laws. I find no effect of parental involvement laws on aggregate abortion rates. Several studies find a similar result on aggregate rates (Blank, George and London 1996,

¹³ Tables 3 presents the estimates for logged outcomes.

Bitler and Zavodny 2001, P. Levine 2002, P. Levine 2003).¹⁴ Similarly, I find no effect of restricting Medicaid funding on abortion rates. The literature is mixed on the effects of these laws. Bitler and Zavodny (2001) find some evidence of a positive effect of restricting Medicaid funds on the abortion rate while Blank et al. (1996) and Levine et al. (1996) both find it reduces abortion rates. The difference in the results is likely due to differences in data and time frames. Table 3 also shows enjoining Medicaid funding increases the abortion rate in estimations with linear state-specific trends. This result is similar to that found in Bitler and Zavodny (2001).

6.2. Birth and Pregnancy Rates

Recall that theory suggests an ambiguous effect of mandatory delay laws on births and a negative effect on pregnancies. The number of births could rise after the law is implemented because pregnant women who are contemplating abortion may decide not to have the procedure due to the waiting period requirement and/or the counseling received. Mandatory delay laws could also cause a decrease in the number of births from a reduction in pregnancies. Mandatory delay laws increase the cost of abortion, which increases the overall cost of unwanted pregnancies. Therefore, women may increase contraceptive use thereby decreasing the number of pregnancies and possibly the number of births.

Table 3 also presents the effects of mandatory delay restrictions on birth rates. Column 2 shows mandatory delay laws increase the number of births by 0.81 percent. An F-statistic of 21.56 verifies the joint-significance of state-specific linear trends. The average birth rate for my sample is 66.55 per 1,000 fertile women. Therefore, mandatory delay laws are related to an increase in the birth rate of 0.54 births per 1,000 women.

¹⁴ Levine (2002) and Levine (2003) both find evidence that parental involvement laws reduce the teenage abortion rate.

To determine whether pregnancy rates change with the restriction, I estimate the effect of mandatory delay laws on the sum of birth and abortion rates per 1,000 fertile women in the population as in Levine (1996). Table 3 also shows that pregnancy rates are unaffected by mandatory delay laws.

6.3. Probability of Having an Abortion

The results in sections 6.1. and 6.2. show that mandatory delay laws do not affect pregnancy rates. Since the evidence also suggests the laws decrease abortion rates and increase birth rates, the effect of the law is mainly on the decision to have an abortion or give birth and not on the decision to get pregnant. I estimate the effect of mandatory delay laws on the decision to have an abortion or give birth controlling for pregnancies by using a logit model. A logit model using state-level abortion rates has the advantage of reporting accuracy when analyzing decisions about abortion. Individual survey data is difficult to use when estimating the effect of policies on abortion because individuals underreport abortion at high rates which vary by culture and legal restrictions (Jones and Darroch 1992, Rossier 2003).

Table 4 presents the marginal effects of mandatory delay laws on the probability of having an abortion over giving birth. The logit model shows mandatory delay laws reduce the probability that women choose abortion relative to giving birth by 0.0097 (or 5.0 percent for the average state).¹⁵ Thus, controlling for pregnancy, women are about five percent less likely to have an abortion relative to giving birth in states with mandatory delay laws.

I further test the effects of mandatory delay laws on the probability of choosing abortion by analyzing the laws in conjunction with visit and counseling requirements. The marginal effects

¹⁵ The average probability of abortion for the entire sample is 0.1953.

for mandatory delay laws by visit and counseling requirement relative to states without mandatory delay laws are also presented in Table 4. Model 2 shows in-person counseling has a larger affect on decreasing the probability that women choose abortion, controlling for pregnancy, compared to counseling obtained online or over-the-phone. This is consistent with my ex ante predictions that in-person counseling has higher emotional and monetary costs. Specifically, mandatory delay laws with in-person counseling requirements reduce the probability that pregnant women choose abortion by 0.0134 (or 6.9 percent) compared to states without mandatory delay laws. Mandatory delay laws with counseling that can be obtained by phone, fax, internet, or mail reduce the probability of abortion by 0.0078 (or 4.0 percent).

Model 3 presents the results of mandatory delay laws with and without counseling requirements on the probability of abortion, relative to states without mandatory delay laws. Mandatory delay laws with and without additional counseling information both reduce the probability that women choose abortion, relative to states without mandatory delay laws. Specifically, mandatory delay laws with additional counseling reduce the probability of abortion by 0.0098 (or 5.0 percent) while mandatory delay laws without the additional information during counseling reduce the probability of abortion by 0.0096 (or 4.9 percent). Because the effect on the decision to have an abortion is similar between states with mandatory delay law that have additional requirements and those that do not have the requirements, the information alone does not appear to have a large impact on the decision to have an abortion or give birth.

The effects of the information provided may depend on whether the information is given in-person or not. Model 4 of Table 4 includes counseling interaction terms for visit and information requirements. The baseline form of mandatory delay laws, where information is obtained online or over-the-phone and does not include controversial information, reduces the probability that

women have an abortion by about 0.0138 (or 7.1 percent). This is important because about 31 percent of my sample with mandatory delay laws have this type of waiting period requirement. Model 4 also shows the most stringent form of mandatory delay laws, those which include controversial information and require in-person counseling, has the greatest impact on reducing the probability of abortion. This restrictive form of mandatory delay laws decreases the probability that pregnant women choose abortion by 0.0382 (or 19.5 percent).

6.4. Comparison to Previous Work

Bitler and Zavodny (2001), Levine (2002), and Medoff (2007) find no effect of mandatory delay laws on abortion rates. The results presented in this paper show mandatory delay laws decrease abortion rates by 5.9 percent. To see whether results differ from previous research due to different controls or extending the time frame to include additional state variation in law changes, I reestimate my model using data coinciding with years found in Bitler and Zavodny (2001), Levine (2002), and Medoff (2007).¹⁶ Using my data and model and the time frames used in their papers, I also find insignificant.¹⁷ Because my model produces insignificant results using a shorter time frame, I contend that the results in this paper differ from previous research due to the additional variation in the laws by using annual data which extends to 2005. A second reason for differences in results could be that Levine (2002) and Medoff (2007) use data from AGI for abortion rates.

Levine (2002) finds mandatory delay laws have no effect on birth or pregnancy rates in a model with state and year fixed effects and state-specific linear trends. In this paper, I find mandatory delay laws are associated with an increase in births, but have no effect on

¹⁶ I estimate my model for years 1976 to 1997 to compare to Bitler and Zavodny (2001). Their data begins in 1974; however, the first mandatory delay law doesn't pass until 1992.

¹⁷ The results are not reported but can be obtained upon request.

pregnancies. To my knowledge, the current literature does not estimate the effect of mandatory delay laws on the probability of abortion or by counseling type.

7. Conclusion

The first mandatory delay law was passed in 1992 following the ruling in *Planned Parenthood of S.E. Pennsylvania v. Casey* (P. Levine 2004). Significant controversy surrounds mandatory delay restrictions to abortion (Richardson and Nash 2006, New 2008) despite the fact that empirical research shows little effect of the laws on fertility (Bitler and Zavodny 2001, P. Levine 2002, Medoff 2007). This paper provides a comprehensive analysis of mandatory delay laws by analyzing the average effects of the law on fertility decisions as well as investigating the impact of the law and counseling requirements on the decision to have an abortion or give birth, controlling for pregnancy.

From 1991 to 2005, 22 states adopted mandatory delay laws and the abortion rate fell from 18 to 13 per 1000 women of child-bearing age. Mandatory delay laws are associated with a 5.88 percent decline in abortions accounting for less than three percent of the overall decline in abortions since the first law was adopted in 1992.

Mandatory delay laws increase the number of births, but have no effect on the number of pregnancies. This suggests that mandatory delay laws affect a pregnant woman's decision to give birth or have an abortion, but they do not affect the decision of women to become pregnant. Further analysis on the decision to have an abortion or give birth shows mandatory delay laws reduce the probability that pregnant women choose abortion by about five percent.

Since the visit and counseling requirements associated with mandatory waiting periods are the point of much debate, I estimate the effects of the laws in conjunction with waiting period visit

and information requirements. Counseling received in-person has a larger effect on reducing the likelihood that pregnant women choose abortion than counseling received online or over the phone. Specifically, in-person counseling reduces the probability that women choose abortion by about seven percent whereas counseling received online or over the phone reduces the likelihood of abortion by four percent. Additional information requirements, however, do not appear to be a significant determinant in reducing abortion rates. The most basic form of mandatory delay laws which allow counseling to be received online or over-the-phone and does not include additional information reduces the likelihood that pregnant women will choose abortion over giving birth by eight percent. However, mandatory delay laws that require in-person counseling including certain additional informational requirements have the largest impact. This restrictive form of the law reduces the probability pregnant women choose abortion by almost twenty percent.

States continue to pass mandatory delay laws and alter their counseling requirements. Recently, several states have adopted ultrasounds as part of their counseling requirements (Guttmacher Institute 2009). The evidence presented in this paper on mandatory delay laws and counseling requirements shows that mandatory delay laws affect fertility by altering pregnant women's decisions whether to give birth or have an abortion.

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Table 1: Variable Definition and Data Source

Variable	Definition	Data Source
Abortion Restrictions		
<i>Mandatory Delay</i>	=1 if state has a mandatory waiting period for abortion	Bitler and Zavodny (2001), Levine (2004), and Americans United for Life; Defending Life 2008, Alan Guttmacher Institute: State Policies in Brief and Monthly State Update Archives
<i>Parental Involvement</i>	=1 if state has a parental involvement law for minors	Bitler and Zavodny (2001), Levine (2004), Alan Guttmacher Institute: State Policies in Brief
<i>Medicaid Funding Restrictions</i>	=1 if state has Medicaid Funding Restrictions	Bitler and Zavodny (2001), Levine (2004), Alan Guttmacher Institute: State Policies in Brief
<i>Medicaid Funding Enjoined</i>	=1 if state enjoined Medicaid Funding Restriction	Bitler and Zavodny (2001)
<i>Border States with Mandatory Delay</i>	Percent of border states that have mandatory waiting period laws	Created from Mandatory Delay
<i>Border States with Parental Involvement</i>	Percent of border states that have parental involvement laws	Created from Parental Involvement
<i>Border States with Medicaid Funding</i>	Percent of border states that have Medicaid funding laws	Created from Medicaid Funding
<i>Border States with Medicaid Funding Enjoined</i>	Percent of border states that have enjoined Medicaid funding laws	Created from Medicaid Funding Enjoined
Fertility Outcomes		
<i>Abortion Rates</i>	Abortions per 1,000 women aged 15 to 44	Johnston Archive: CDC and AGI sources
<i>Birth Rates</i>	Births per 1,000 women aged 15 to 44	U.S. Department of Health and Human Services: National Vital Statistics System
<i>Pregnancy Rates</i>	Sum of Abortions and Births per 1,000 women aged 15 to 44	Created from Abortion and Birth Rates
State Controls		
<i>Hospital Bed Rate</i>	Number of hospital beds per million people in the population	U.S. Census Bureau: Statistical Abstracts of the U.S., Health and Nutrition
<i>Physician Rate</i>	Number of physicians per 1,000 people in the population	U.S. Census Bureau: Statistical Abstracts of the U.S., Health and Nutrition
<i>% Women State Legislators</i>	Percent of state legislature that are women (including both parties)	Center for the American Woman and Politics
<i>Marriage Rate</i>	Marriage Rate per 1,000 population per state	U.S. Census Bureau: Statistical Abstracts of the U.S., Vital Statistics
<i>Female Labor Force Participation Rate</i>	Female Labor Force Population Rate	U.S. Census Bureau: Statistical Abstracts of the U.S., Labor Force, Employment, and Earnings
<i>% Population (white)</i>	Percent of female population that is white	U.S. Census Bureau: Current Population Survey
<i>% Population (black)</i>	Percent of female population that is black	U.S. Census Bureau: Current Population Survey
<i>Population (women)</i>	Population of women by ages 15-19, 20-24, 25-34, 35-44	U.S. Census Bureau: Current Population Survey
<i>Unemployment Rate</i>	State Unemployment Rates	U.S. Department of Labor: Bureau of Labor Statistics
<i>Per Capita Income</i>	Real per capita income per state	Regional Economic Information System
<i>Maximum AFDC and TANF Benefits</i>	Maximum AFDC and TANF Benefits paid to families of three with no income	U.S. Department of Health and Human Services: Administration for Children and Families, Welfare Rules Databook

Table 2: Descriptive Statistics for Full Sample and by Mandatory Delay Restrictions

Variable	Full Sample	With <i>Mandatory Delay</i>	Without <i>Mandatory Delay</i>
Restrictions			
<i>Mandatory Delay</i>	0.1202	1	0
Mandatory Delay:			
<i>Requires In-Person Counseling</i>	0.0344	0.2865	0
<i>Allows Counseling received via mail, phone, fax, or internet</i>	0.0858	0.7135	0
<i>Includes Counseling Information</i>	0.0608	0.5056	0
<i>Does not include Controversial Information</i>	0.0594	0.4944	0
Other Restrictions			
<i>Parental Involvement</i>	0.3440	0.9663	0.2594
<i>Medicaid Funding</i>	0.6907	0.9494	0.6554
<i>Medicaid Funding Enjoined</i>	0.1540	0.0225	0.1719
<i>Percent of Border States with Mandatory Delay</i>	0.1186	0.3484	0.0872
<i>Percent of Border States with Parental Involvement</i>	0.3456	0.6965	0.2977
<i>Percent of Border States with Medicaid Funding</i>	0.6966	0.7866	0.6843
<i>Percent of Border States with Medicaid Funding Enjoined</i>	0.1467	0.0968	0.1535
Fertility Outcomes			
<i>Abortion Rate</i>	16.510	10.528	17.327
<i>Birth Rate</i>	66.547	66.549	66.546
<i>Pregnancy Rate</i>	83.057	77.077	83.873
<i>Probability of Abortion</i>	0.1953	0.1362	0.2033
<i>Probability of Birth</i>	0.8047	0.8638	0.7967

Notes: Sample: 1976 – 2005, $n = 1481$ (unbalanced panel). Abortion, birth, and pregnancy rates are numbers of abortions, births, and pregnancies per 1,000 females aged 15 to 44 in each year and state. Probability of Abortion is the abortion rate divided by the pregnancy rate by year and state. Probability of Birth is the birth rate divided by the pregnancy rate for each year and state.

Table 3: Abortion Access Restrictions on State Abortion, Birth, and Pregnancy Rates

Variable	Abortion Rates (1)	Birth Rates (2)	Pregnancy Rates (3)
<i>Mandatory Delay</i>	-0.0588*** (0.0214)	0.0081* (0.0044)	-0.0020 (0.0054)
<i>Parental Involvement</i>	0.0223 (0.0165)	0.0066* (0.0034)	0.0034 (0.0041)
<i>Medicaid Funding</i>	0.0079 (0.0212)	0.0121*** (0.0044)	0.0098* (0.0053)
<i>Medicaid Funding Enjoined</i>	0.0514** (0.0248)	0.0107** (0.0052)	0.0216*** (0.0062)
Adjusted R ²	0.9125	0.9273	0.9302

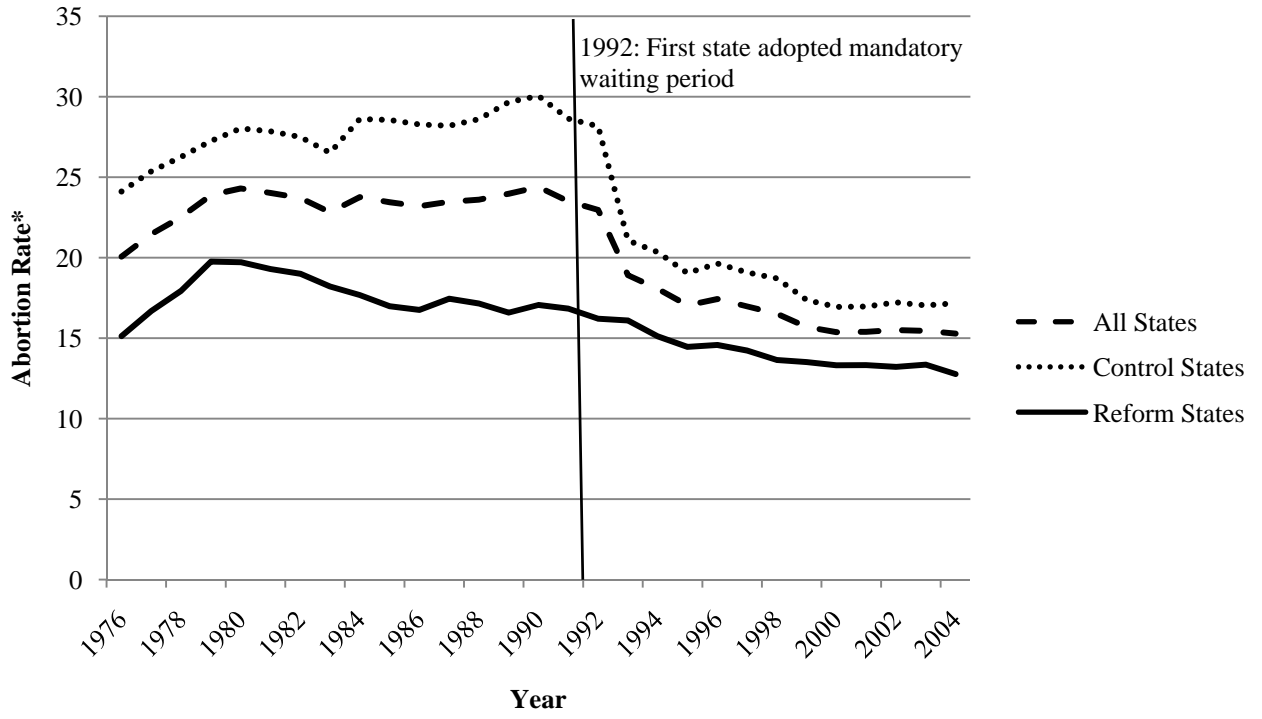
Notes: Sample: 1976 – 2005, $n = 1481$ (unbalanced panel). Standard errors are in parentheses. *, **, and *** indicate statistical significance at the ten, five, and one percent levels, respectively. Regressions are weighted using female population per state and year. Regressions include state time-varying controls, state and year fixed effects and state linear time trends. The abortion rate is the number of abortions per 1,000 women aged 15 to 44 in each year and state. Birth rate is the number of births per 1,000 women aged 15 to 44 by year and state. Pregnancy rate is the sum of births and abortions per 1,000 women aged 15 to 44 by year and state. The outcome variable is logged. Models include time-varying state controls listed in Table 1.

Table 4: Effects of Mandatory Delay Laws on the Probability of Having and Abortion

	Probability of Abortion
Model 1:	
<i>Mandatory Delay</i>	-0.0097*** (0.0032)
Mandatory Delay Law includes:	
Model 2:	
<i>In-Person Counseling (2 Visits)</i>	-0.0134*** (0.0051)
<i>Online or Over-the-Phone Counseling (1 Visit)</i>	-0.0078** (0.0038)
Model 3:	
<i>Includes additional information at counseling</i>	-0.0098** (0.0047)
<i>Does not include additional information at counseling</i>	-0.0096** (0.0040)
Model 4:	
<i>In-person counseling includes additional information</i>	-0.0382*** (0.0104)
<i>In-person counseling does not include additional information</i>	-0.0064 (0.0049)
<i>Online or over-the phone counseling includes additional information</i>	-0.0063 (0.0058)
<i>Online or over-the phone counseling does not include additional information</i>	-0.0138** (0.0058)

Notes: Sample: 1976 – 2005, $n = 1481$ (unbalanced panel). Estimates are reported as marginal effects. Standard errors are in parentheses. *, **, and *** indicate statistical significance at the ten, five, and one percent levels, respectively. Regressions are weighted using female population per state and year. Regressions include state time-varying controls, state and year fixed effects and state linear time trends. The estimates in each model are relative to states without mandatory delay laws. Time-varying state controls are listed in Table 1.

Figure 1: Abortion Rates



*Number of abortions per 1,000 females aged 15 to 44 in the population