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Changing the Price of Marriage: Evidence from Blood Test Requirements

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Abstract:

We use state repeals of blood test requirements for a marriage license that occurred between 1980 and 2005 to examine the impact of changes in the price of marriage on the marriage decision. We begin by using state-level marriage rate data, and show that repealing state blood test requirements increases the number of marriage licenses issued in a state by 6.2%. Using individual-level marriage license data from 1981-1995, we find that about half of this effect is due to couples seeking marriage licenses in other states, while the other half is due to deterred marriages. We then examine the marital status of young mothers using birth certificate and Census data, and find that the presence of a blood test requirement in one's state decreases the probability of being married, particularly among lower educated women.

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1. Introduction

Marriage has been shown to be related to a number of important outcomes such as earnings and productivity, (Ahituv and Lerman, 2007; Korenman and Neumark, 1991), health (Clarka and Etileb, 2006; Duncan, Wilkerson, and England, 2006; Frech and Williams, 2007; Kenney and McLanahan, 2006; Liu and Umberson, 2008), early child cognitive outcomes (Liu and Heiland, forthcoming), longevity (Felder, 2006), and happiness (Blanchflower and Oswald, 2004; Zimmerman and Easterlin, 2006). Most studies find that marriage is correlated with positive outcomes, such as better health or labor force outcomes.[1] As such, researchers and policy makers have long been interested in the effects of public policy on the decision to marry. These policies include those that relate to the marriage contract directly (such as minimum age requirements and divorce laws) and those that affect couples' economic incentives to marry (such as income taxes or transfer programs).

In this paper, we examine one policy that has not been previously studied—blood test requirements for obtaining a marriage license. The blood test requirements (from here on, BTRs) we consider were enacted in the first half of the twentieth century as part of public health campaigns to reduce the spread of communicable diseases and prevent birth defects. The laws required couples applying for a marriage license to be screened for certain conditions, commonly rubella or syphilis. However, after penicillin proved to be a cheap and effective treatment for syphilis and vaccines were developed for rubella, these screenings were no longer considered cost-effective. In 1980, thirty-two states required a blood test in order to receive a marriage license. Seventeen states repealed

1 The marriage wage penalty for white women is a notable exception (Waite 1995).

their laws in the 1980s, and by 2006 only Mississippi, Montana, and the District of Columbia still required premarital blood tests.

We investigate the effects of the repeals of the BTRs on the marriage decision. The blood tests are an interesting case to consider for several reasons. First, the state law changes occurred over a wide window of time (1980-2005), allowing us to separate the effect of the law change and overall shifts in marriage rates. Second, while the effects of the policy may vary by socio-economic status or demographic group, the policy itself was applied uniformly to the entire population considering marriage (unlike age requirements or tax or transfer policies). Third, because the tests were originally enacted in the interest of public health but were repealed after they became obsolete, the effects of the policy change should not directly affect other outcomes such as labor force participation, earnings, or fertility. Therefore the repeals may provide variation in marriage rates that could be used to test whether the well-established correlation between marriage and various positive outcomes represents a causal relationship.

There are several ways in which a BTR might increase the cost of getting married and induce couples to either obtain their license in another state or decide not to marry at all. First, the act of submitting to a blood test and waiting for results induces a waiting period for a marriage license that might deter spur-of-the-moment marriages. Also, since blood tests are usually paid for by the individual wishing to be married, the BTR increases the dollar cost of marriage. There are also likely to be other nonpecuniary costs associated with going to the doctor and having blood drawn or the potential cost of testing positive for and having to reveal that condition to one's partner. These costs might

be relatively greater for certain populations, including those with lower income and lower education levels.

We use four different data sets to study the impact of BTRs on marriage. First, we examine CDC reports of state marriage rates (defined as marriage licenses issued per 1,000 state residents) and find that BTRs are associated with a 6.2% decrease in marriage licenses issued. Since couples can obtain marriage licenses outside of their state of residence, we also use individual-level marriage license data with information on state of residence. We find that about half of the drop in marriage licenses is due to couples going out of state to get married with the other half actually being deterred from marriage. We also use birth certificate data for first time mothers with information on whether the mother was married at the time of birth and find that for this group BTRs deter marriage, and the effect is largest for mothers without a high school degree. Finally, we use Census and American Community Survey data and look at mothers whose first child was born in the last three years. We find that young mothers are less likely to be married or cohabiting if there is a blood test law in place in their state.

In the next section, we discuss the literature on the effects of public policies on marriage, and describe in detail the BTRs we study. Section 3 describes our data sources and methods, and Section 4 presents our results. The last section concludes.

2. Background

2.1 Review of Literature on Marriage, Public Policy and Methods

As discussed above, previous research has shown that marriage is related to a host of important outcomes, and that most find that marriage is correlated with positive

outcomes. However, it is not clear whether marriage itself actually improves outcomes, or whether the relationship is driven by other factors such as positive selection into marriage. Many of these studies use multiple regression analysis (OLS, probit, or logit) with a variety of controls. Studies that rely on these techniques suffer potential omitted variables bias if an omitted variable is correlated with an explanatory variable and the outcome of interest. This is quite likely the case with studies of marriage since the same unobserved characteristics that may determine ones education level (for example) may also determine whether someone enters a marriage contract. Additionally, when examining marriage as the outcome, there is concern regarding simultaneity (reverse causality).

A possible solution to both of these problems is the use of instrumental variables—though it has proven to be difficult to find good instruments for marriage. One instrument that has been used is exogenous changes in sex ratios produced by immigration waves (Angrist 2002) or male incarceration rates (Charles and Luoh 2007). Also, a recent study by Dahl and Moretti (2008) uses child's gender to show that women pregnant with males are more likely to get married. However, use of these instruments to estimate the causal impacts of marriage can be limited by the somewhat narrowly defined treated population (e.g. immigrant populations in the early 20th century, pregnant women). A potential advantage of using BTRs as an instrument for marriage is that they were repealed over a long and recent period in U.S. history and potentially affect the entire population of couples considering marriage in the affected states.

Motivated by studies on the effects of marriage, researchers have investigated the effects of various public policies on the marriage decision. For example, Rasul (2006)

considers how unilateral divorce laws might affect rates of marriage. He argues that allowing one partner to dissolve the marriage alters the value of marriage—raising it by allowing the person to leave an unhappy marriage, and lowering it by making it possible for the partner to leave. To determine which effect dominates, he empirically examines the effect of unilateral divorce laws on marriage rates, and finds that the laws decreased marriage rates and also decreased rates of remarriage. Stevenson and Wolfers (2007) provide a summary of both the theoretical and empirical literature on the effect of unilateral divorce laws on divorce rates, and conclude that more relaxed divorce laws had "at most a small effect on divorce rates."

Economists have also utilized a quasi-experimental approach to examine how other policies might have affected (whether intentionally or not) couples' incentives to marry. First, the U.S. tax system has a "marriage penalty," in which married couples who file jointly are taxed at a higher rate than they would be if they were single and filed separately. Moffitt (1998) provides a review of the literature examining the impact of the marriage penalty on marriage rates from the 1970s to the 1990s, and concludes that most research supports a marriage disincentive effect. Recent research has focused on the interaction of the income tax system and transfer systems such as the EITC—see Dickert-Conlin and Houser (1998) for a description of how marital status affects the net income of low-income families. Eissa and Hoynes (2000) show that the EITC increased marriage rates for low-income families and lowered them for middle-income families. The effects of the 1996 welfare reform on marriage are also studied by Bitler, et al. (2004), who find that the policy change may have decreased entry into marriage. Last, Goldin and Katz

(2002) use laws that regulate access to contraception (primarily age of majority laws) and find that age at first marriage rose in response to these changes.

Finally, researchers have considered the effects of minimum age requirements for marriage. Blank, Charles, and Sallee (2007) find that when states have a higher minimum age for marriage, some marriages are delayed. However, they also find that many young people marry out of their home state to avoid restrictive laws. Dahl (2005) obtains similar results in his work using minimum age requirements as an instrument for early marriage. We expect that BTRs may operate in much the same manner—deterring marriage for some individuals, and driving others to less restrictive states to obtain their licenses. We explore both possibilities below.

2.2 Blood Test Requirements

Historically, many states have required applicants for a marriage license to obtain a blood test. These tests were for venereal diseases (most commonly syphilis), for genetic disorders (such as sickle-cell anemia), or for rubella. The tests for syphilis were part of a broad public health campaign enacted in the late 1930s by U.S. Surgeon General Thomas Parran.[2] Parran argued that premarital testing was necessary to inform the potential marriage partner of the risk of contracting a communicable disease, and to reduce the risk of birth defects associated with syphilis.[3] According to Brandt (1995), "by the end of 1938, twenty-six states had enacted provisions prohibiting the marriage of infected individuals" (p. 147). Screenings for genetic disorders and for rubella were also

2 Our discussion on venereal disease draws primarily from Brandt (1985).
3 Congenital syphilis is strongly linked to blindness and paralysis, and most infants born with the disease died shortly after birth (Brandt 1985).

implemented in the interest of minimizing the risk of genetic disease or birth defects in the couple's offspring.[4]

In the case of syphilis, however, it was soon recognized that premarital blood testing was not a cost-effective way to screen for the disease. Despite reports that 10% of Americans were infected at the time, only 1.34% of applicants in New York City's first year of testing were found to have the disease. Brandt (1995) notes that a premarital exam was "not the optimal locus for screening," since couples seeking to marry were not likely to be in the most at-risk groups, and individuals who knew they were infected could wait until the infection cleared to apply for a license. The tests became even less valuable over the 1950s, when penicillin emerged as a cheap and effective treatment for the disease. Continuing with New York City's example, early cases of syphilis dropped 90% between 1946 and 1955, and in 1976 "only 39 cases of previously undetected syphilis were found in approximately 116,000 premarital venereal examinations . . . the cost of uncovering these cases was almost $60,000 per case" (p 177). Nationwide, couples spent over $80 million to reveal 456 cases. Similarly, the need for rubella screening lessened after vaccines for rubella were licensed in 1969. "Today there are fewer than 1,000 cases of rubella reported each year in the U.S. on average and less than 10 cases of congenital rubella syndrome" (www.immunizationinfo.org).

These reductions in the prevalence of the diseases, largely due to improvements in medical technology, led to the repeal of the requirements in many states. For example, an article noting the repeal of Massachusetts' law in 2005 reported that "there are so few

4 According to the National Network for Immunization Information, "up to 85% of expectant mothers infected in the first trimester will have a miscarriage or a baby with CRS [Congenital Rubella Syndrome]" (www.immunizationinfo.org).

syphilis cases now among engaged couples that the test is outdated and an added economic burden . . . The test is also designed to detect rubella, but people are now vaccinated against that disease" (LeBlanc 2005). While we have found no systematic explanation for why individual states repealed their laws when they did, in the next section we test for possible endogeneity in the timing of the repeals. We find that the repeals are not a function of state levels of marriage rates or rates of syphilis and gonorrhea, or of trends in marriage rates.

It is important to mention that even in the early days of BTRs, there is evidence that couples took steps to avoid the tests (Brandt 2005):

> After Connecticut passed its law in 1935, and before the New York Legislature had taken action, weekend marriages in New York counties bordering Connecticut rose by 55 percent . . . the number of marriages in some states reportedly declined after premarital exams became legally required. (p. 149).

There was also the view that BTRs might discourage marriage altogether: "In New Jersey some state legislators expressed concern that premarital laws that restricted marriage to the healthy could lead to an increase of free love, illegitimacy, and common law marriages" (p. 149). Thus, our hypothesis that BTRs might decrease marriage licenses issued by a state and possibly deter marriages finds support in the historical record.

Information on BTRs used in our analysis was obtained by searching state statute volumes. In some cases, when a law was repealed, there was no record of the law in the volumes. For this reason, we supplemented our research with searches of newspaper records using Lexis-Nexis. In order to be counted as a repeal, we required that we find two separate articles referring to the repeal. Using these criteria, we identified 32 states

that had a BTR in 1980. Of these 32, 17 states repealed their law in the 1980s, 8 repealed in the 1990s, and 4 more repealed between 2000 and 2006, leaving only 3 with a BTR in 2006. We did not observe a BTR for Illinois and Louisiana in 1980, but each state passed a law requiring a blood test for the AIDS virus in 1988. Because the tests were expensive and identified few cases of AIDS, Louisiana repealed the requirement in November of 1988 and Illinois did so in 1989. Figure 1 shows the timing of changes in BTR laws in each of the US states.

2.3 Blood Test Requirements and Marriage

We utilize the within-state variation produced by the repeal of blood test laws to examine the laws' impact on marriage. The presence of requirements may increase the price of obtaining a marriage license in several ways. First, in many cases there is a waiting time of at least a few days between the admission of a blood test and the receipt of the results. Calls to clinics in DC and Mississippi, the two states that still had a test in 2008, found that couples wait three to five days for the results of their tests. Additionally, a couple may need to make an appointment with their physician or local clinic to be tested. Thus, the BTRs introduce a waiting period that could prevent couples who decide to marry on the "spur-of-the-moment" from doing so.[5]

Further, the presence of a BTR may increase the price of obtaining a marriage license in several ways. To comply with a requirement, individuals applying for a marriage license must pay for the doctor's visit and blood test in most cases, which "can cost couples hundreds of dollars" (Leblanc 2005). Clinics in DC and Mississippi

5 While we have no data on the prevalence of spur-of-the-moment marriages, we do observe the day of the week and type of ceremony in our marriage license data. In 1980, 10.6% of marriages were civil ceremonies that took place between Monday and Thursday, suggesting that a nontrivial portion of marriages are not of the (presumably planned) weekend-church-wedding-variety.

reported per-couple costs of $40 and $26, respectively; in DC, calls to doctors' offices found that tests could cost as much as $200 per couple. There may be other financial costs associated with obtaining the test, including the opportunity cost of time spent.

Finally, there may be psychic costs of a BTR as well. As Bowman (1977) observes, "the mandatory testing for carriers of genetically determined diseases at the time of marriage application can result in serious psychological trauma, for the decision has already been made to marry." Applicants may wish to avoid learning about their disease status, or may want to keep this information from their partners. There may also be non-negligible disutility from a visit to the doctor, or from the procedure of having blood drawn. Taken together, we believe these costs may have made a BTR a deterrent to obtaining a marriage license in states with the laws, and may have also decreased couples' likelihood of marrying at all.

Figure 2 shows the number of marriage licenses issued per 1,000 state residents, before and after the repeal of a BTR. Data are from the CDC's reports of state marriage rates (described in more detail in the next section). The solid line plots the average of the marriage rates for the 23 states who had a requirement in place in 1980, but who repealed their law by 2001. We center the figure at the year the law was repealed in each state and report the marriage rates for the five years before and after the repeal of the law. The dotted line represents the "control" group of 17 states that did not have a blood test law at any time between 1980 and 2001. For this group, the mean marriage rate t years from repeal is calculated using an average of marriage rates in years in which a law was repealed in another state, following Ayers and Levitt (1998).

As Figure 2 shows, marriage rates are trending downward over this period (highlighting the need to control for trends in marriage in our empirical specifications). However, this downward trend appears to be interrupted in the year that states repeal their BTRs, when an increase of about 2% in marriage licenses issued is observed. This increase persists in the years immediately following the repeal, and it appears that in the long run marriage rates may remain above the pre-repeal trend. Importantly, states with no BTR over this period show no break in the downward trend in marriage rates. In the next section, we describe our empirical strategy for confirming these results and for examining the impact of the requirements on marriages more generally.

3. Data and Methods

We will be using within- state variation in whether states require a blood test for a marriage license to examine the impact of the laws on marriage behavior. The general specification is:

$$y_{st} = \beta_0 + \beta_1 * bloodtest_{st} + \alpha_s + \delta_t + \tau_{st} + \varepsilon_{st} \quad (1)$$

where $bloodtest_{st}$ is a dummy variable equal to one if state *s* had a blood test for the entire year in year *t*, α_s represents state fixed-effects, δ_t are year dummies, and τ_{st} is a quadratic state-specific time trend . The dependent variable will be a measure of marriage behavior in state *s* and period *t* and will vary with the particular data set and specification.

As with any identification strategy using variation in state laws, one must be concerned with the exogeneity of the laws. Because we include state fixed effects, we will only suffer from bias if there is endogeneity in either the *timing* of the repeal or in

the presence of a law at the beginning of the time period. As a test for the former, we perform a probit regression where the dependent variable is equal to one in the year that a law was repealed and zero otherwise. We regress the repeal on lagged state levels of marriage and STD rates, and on trends in marriage rates. The results are presented in Table 1. We find that these variables are not predictors of the repeal of a law—the coefficients are neither statistically nor practically significant.

To further address endogeneity concerns, we include state fixed effects and state-specific quadratic time trends in all of our preferred specifications. We also include year dummies in all specifications, to allow for any unspecified secular trends in marriage rates. As a final check, we reproduce the marriage license results of Table 2 in the Appendix (Table 7), adding a placebo law that is repealed two years before each state's actual repeal. In all but one of the twelve specifications the placebo law is statistically insignificant, and the estimated effect of the BTR is qualitatively and quantitatively similar.

We use four different synthetic panel data sets in our analysis.[6] First, we use annual state marriage rates obtained from the CDC's Vital Statistics data for 1980-2006. Marriage rates are defined as the number of marriage licenses issued per 1,000 state residents. Thus, estimating equation (1) using these marriage rates as the dependent variable will tell us whether the laws had any effect on the number of marriage licenses issued by states. The advantage of this data set is that it is available for the entire time period we are interested in studying, and for all states. States might also be interested in knowing the effects of the laws on license applications, since marriage license fees are a

6 See the data appendix for detailed information on data sources.

source of revenue for local and state governments. However, even if we see that the laws decrease marriage licenses, we will not be able to identify decreases in actual marriages using this data set—couples in states with requirements could still be marrying but obtaining their licenses in another state. Furthermore, this data is not available at a more detailed level (for example, subdivided into racial or education categories).

For these reasons, we also use the Marriage and Divorce Detail Files from Vital Statistics, which contain individual-level data from marriage licenses. The data are available from 1981 to 1995, and not all states report their individual license data (see the data appendix). However, the data is ideal for analyzing the impact of a change in blood tests on marriage, as both the state of residence and state of marriage are reported. Thus, we are able to examine the impact of BTRs on marriage licenses issued per 1,000 state residents, *even if the couple married in another state*. This allows us to see if the laws actually deterred marriage, as opposed to simply sending residents out of state for their marriage licenses. Also, because these are micro data we are able to construct marriage rates by racial group.[7] Finally, we can use the data to see whether the laws affect couples' likelihood of marrying in their state of residence or in an adjoining state.

We supplement our analysis using the Vital Statistics Natality Detail files for 1980-2002. The data contain a virtual census of births to women in the United States, with about four million births per year. For most states women are asked to report whether or not they are married at the time of birth, and we use this data to obtain both

7 We also constructed marriage rates by education, but because education is only reported on the marriage license data through 1988, those results are not reported here.

marriage and birth information for women ages 18 to 25. [8] We choose this group because young first-time mothers are plausibly "at-risk" for marriage, so the BTRs might have an effect on this population. These mothers are also important for policy makers interested in rates of out-of-wedlock childbearing or in outcomes for children born in and out of marriage. The model is similar to equation (1), but the dependent variable is a binary variable equal to one if the mother is married at the time of birth. For tractability, the data are collapsed into state-year-age-race cells. We include controls for mother's race and education, and we can divide the sample to test the hypothesis that the BTRs have a greater effect on low-SES women.

Finally, we turn to estimating the effect of the laws on respondents' reported relationship status in the 1990 and 2000 Decennial Census and the in 2001-2006 American Community Survey (ACS). In addition to allowing us to examine the effect of BTRs on marriage in a fourth data set, the Census and ACS data include "unmarried partner" as one of the relationship codes. This allows us to examine whether rates of cohabitation are affected by the BTRs. We pool data from the 1990 and 2000 5% and 1% PUMS and the 2000-2006 ACS. For comparability with the birth certificate results, we restrict our sample to women whose oldest child was born in the last three years. We use the relationship codes of the child's mother and her spouse or partner, and exclude all three-generational households (9% of the sample) because it is difficult to know which group the mother belongs to in these cases. Our analysis sample includes 504,380 households, of which 81.2% are married, 7.8% are cohabiting, and 11% are single

8 In states where the mothers are not asked the marriage questions directly, marital status is imputed by the NCHS. In 1980, marital status is imputed for seven states; by 2006, only two states (MI and NY) still impute marital status.

mothers. We test whether BTRs influence whether a mother is married, cohabiting, or single, and we control for the age, race/ethnicity, and education and include state and year fixed effects and state-specific quadratic time trends.

4. Results

4.1 Effect of Laws on Marriage Licenses Issued

We first estimate the effect of states' BTRs on the number of marriage licenses issued by the state. Data are from CDC reports of state marriage rates from 1980-2006—the same data that were used to create Figure 2. Results are reported in Table 2. Each coefficient in the table is the estimate of the effect of the presence of a BTR on the number of marriage licenses issued per 1,000 state residents (β_1 in equation (1)). We report our results with and without state-specific time trends, and we exclude California from some specifications because of a policy that allowed residents to obtain confidential marriage licenses that did not require a blood test. First, we observe that including California weakens the impact of the BTR; this would be expected if California's BTR was not binding. Therefore, we will drop California in future results. Also, we see that the inclusion of state-specific time trends can significantly affect the coefficients. We believe this is because many states were seeing dramatic declines in marriage rates over this period, largely due to social and cultural forces. If these changes coincided with the repeal of the BTRs, we might erroneously attribute decreases in marriage rates to those repeals. As such, for the remainder of the paper we focus on results with state-specific time trends.

We find that for the 1980-2006 period, marriage licenses decrease by 0.5447 per 1,000 state residents in our preferred specification with state-specific time trends and with California omitted. This corresponds to a 6.2% decrease in marriage licenses issued. In the top two panels of Table 2, the sample is split at 1995, to examine the effect of the laws in the earlier and later years of the time period. We choose 1995 as the dividing point for comparability with results using license data in Tables 3 and 4. We see that the negative effect of BTRs on marriage licenses issued is larger post-1995, where the coefficient -0.5697 reflects a 7.0% decrease in marriage licenses issued. We might expect BTRs to have a larger effect in later years for several reasons. The stigma of cohabiting or being single may have lessened in the later period, so that couples are more likely to decide to live together rather than marry in response to a BTR. Decreases in travel costs may have made it easier to travel to another state to obtain a license. Finally, as more states repeal their laws, couples have more options when looking to marry in a state that does not require a test.

As mentioned above, we repeat the analysis of Table 2 but included placebo BTRs that were repealed two years prior to the actual law. We do this to confirm that the effect we observe is not driven by, for example, trends in marriage rates that motivated the repeals. These results are in Appendix Table 7, and we find that the placebo law is only significant in one of the twelve specifications, and that the qualitative effects of the BTRs are unchanged.

The results in Tables 2 and 7 show a large and statistically significant effect of the BTRs on marriage licenses issued by a state. Policy makers might be interested in this finding, since marriage license fees are a source of revenue for state and local

governments. However, while these results are consistent with the hypothesis that BTRs actually deter *marriage*, we cannot test this directly with this data. It is possible that the observed decrease in licenses issued is driven by couples who are still getting married, but are just doing so in another state. To study the effect of BTRs on the likelihood of marriage, we turn to results using individual marriage license data.

4.2 Effect of Laws on Marriages to State Residents

The results in Table 3 are based on state marriage rates constructed from individual-level marriage license data. This data includes information on the bride and groom's state of residence, and as long as the couple marries in a reporting state, we observe the marriage. This allows us to approximate the number of *marriages* per 1,000 state residents, as opposed to the number of *marriage licenses* issued by the state (as in Table 2). The actual number of marriages observed will be an underestimate, since not all states report individual-level license data. The fact that not all states report will only bias our results if couples that choose to marry out of state in response to BTRs are more likely to marry in non-reporting states than other couples who marry out of state.[9] The individual level data also allows us to examine marriage rates by racial group.

First, when state marriage rates are constructed using the groom's state of residence, we see a decrease of 0.2585 marriages per 1,000 residents in response to BTRs, for a 2.8% decrease in the marriage rate. Compare this to the result in Table 2, which finds a 5.4% decrease in marriage licenses issued between 1980 and 1995. Thus, it appears that about half of the decrease in licenses is due to couples marrying out of state, while about half choose not to marry at all.

9 The non-reporting states are AZ, AR, NV, NM, ND, OK, TX, and WA.

Though the results for blacks are imprecise, the point estimates for racial groups suggest that the BTRs are more of a deterrent to marriage for blacks than for whites. The coefficient -0.4809 represents an 6.1% decrease in marriage rates for blacks, while the effect for whites is a 3.5% decrease. When the sample is restricted to marriages where the groom is under age 30, the effect of the laws is generally greater in magnitude and again the percentage effect is strongest for blacks. These results suggest that BTRs do have more of an impact on lower-SES groups, who might find the economic or other costs of the tests to be a greater deterrent. The results are similar when state marriage rates are constructed using the bride's state of residence.

To further explore the issue of couples marrying in other states in response to a BTR, we use data on state of residence and state of marriage to examine the laws' impact on couples' likelihood of marrying in their state of residence or in an adjoining state. These results are reported in Table 4. In Panel A, the dependent variable is constructed by taking the total number of marriages to a state's residents as the denominator, and the number of those marriages that took place in the state as the numerator. We see that the percent of couples marrying in the groom's state of residence was 2.73 percentage points lower when the groom's state had a BTR in place. For grooms under 30, we also see lower in-state marriage rates, though the coefficient is smaller. The fact that older grooms are less likely to marry in-state in response to the requirements may be due to their ability to bear the costs of an out-of-state marriage. Results are very similar when the bride's state of residence is used.

The results in Panel B show the effect of BTRs on couples' likelihood of marrying in an adjoining state. While the effect is only marginally significant, we see

that the percent of couples marrying in an adjoining state is 1.95 percentage points higher when a requirement is in place. The magnitude of the coefficients in Panel B is slightly less than the corresponding coefficients in Panel A—suggesting that when couples are driven out of state for their marriage licenses, most marry in an adjoining state, while a few travel even further away.

The estimates using the Vital Statistics Marriage License data show that BTRs send residents out of state for marriage licenses and in some cases deter marriage altogether. We now look to confirm the marriage-deterrent effect of BTRs using two alternative data sets.

4.3 Effect of Laws on Marital Status of First-Time Moms

Using the Vital Statistics Natality Detail data, we measure the effect of the laws on the fraction of first-time mothers who are married. Data are collapsed to the state-year level and results are reported in Table 5. For all mothers over 18, the presence of a BTR in the year of the birth decreases the likelihood of being married by about 0.4 percentage points, for a 0.53% effect. This effect is smaller than the 2.8% effect observed using marriage license data (perhaps because the marriage decisions of new mothers are less likely to be affected along this margin), but still practically and statistically significant. Importantly, we find the largest percent effects (3.3%) for mothers who do not have a high school degree, and for first time mothers ages 19-24, BTRs decrease the fraction of mothers who are married at the time of birth by 1.2%. Again, it appears that the laws have a greater effect on low-SES groups.[10]

4.4 Effect of Laws on Marriage and Cohabitation

Finally, we use a fourth data set to confirm the marriage-deterrent effect of BTRs. The Census and American Community Survey data from 1990 and 2000-2006 contain information on living arrangements, so that we are also able to identify whether a person is married, single, or in a cohabiting relationship. For comparability with the birth certificate results, we limit the sample to women whose oldest child is three years or younger.

Table 6 shows the results from a linear probability model that controls for race age, and education (where the omitted group for education is having less than a college degree). Each column represents the effect of a BTR on the probability of being in the designated relationship state. BTRs reduce the probability of marriage by 2.60 percentage points, for a 3.4% effect. This effect is larger than that in the birth certificate data, though those data are from a longer and more complete time period. The 3.4% effect is, however, quite close to the 2.8% effect found using marriage license data. Further, we find that BTRs also decrease the probability of cohabitation by 1.13 percentage points, suggesting that most couples deterred from marriage by a blood test requirement do not live together as an alternative. It appears that, at least in the short-run, the BTRs increase the likelihood that young mothers remain single, rather than enter into either a marriage or cohabiting relationship.

5. Conclusion

In this paper, we consider the effect of the repeal of states' blood test requirements for marriage licenses on marriage. We begin by showing that blood test

10 In fact, race may have been a proxy for education in Tables 3 and 4.

requirements decrease marriage licenses issued by a state by 6.2% between 1980 and 2006. We then use individual-level marriage license data from 1981 to 1995 to confirm that for this period, about half of this effect was due to couples going out of state for their licenses, while the rest was due to couples deciding not to marry at all. We also used birth certificate data and Census/American Community Survey data to show that for young mothers, the likelihood of being married was lower in states with a blood test requirement. This result seems to be greater for individuals with lower socio-economic status.

Policy makers who are interested in promoting marriage may find these results useful when predicting the impact of policies that change the cost of marriage. While the issue of blood tests themselves is no longer relevant in most cases (Missouri and D.C. being exceptions), other policies that change the cost of marriage include required premarital counseling, waiting periods, and license fees. For example, in 2008, Texas initiated a "Twogether in Texas" program that requires premarital counseling to avoid a waiting period and $60 fee for a marriage license (www.twogetherintexas.com). We have shown that even small changes in the cost of marriage can have significant effects, particularly for certain populations. This result might also generalize to policies such as tax and transfer programs, where previous research has had difficulty in isolating the disincentive effects of changing costs.

These results should also be important for social scientists studying public policies and the marriage decision, for reasons discussed in the introduction. However, we suggest that our findings might also be useful for researchers interested in the effects of marriage on other outcomes, including health, labor force participation, economic

well-being, and fertility. It appears that blood test requirements provide plausibly exogenous within- and across-state variation in the cost of marriage, and thus might be used to identify such effects. This strategy should be particularly helpful to researchers studying the effects of marriage for low-SES populations, as the laws have the greatest impact for these groups.

DATA APPENDIX

1. Information on state blood test requirements was obtained from state statute volumes. A complete list of volumes used is available upon request. We supplemented our research with searches of newspaper records using Lexis-Nexis. In order to be counted as a repeal, we required that we find two separate articles referring to the repeal.

2. CDC-Reported Marriage Rates from 1975-2006 were obtained from the website of the Center for Disease Control's National Center for Health Statistics: http://www.cdc.gov/nchs/#.

In Figure 2, using this data, eleven states are not included. Hawaii and Nevada are omitted because of high marriage rates; California and Oklahoma are omitted for missing data; Illinois is omitted because the state adopted a law during this time period that lasted over one year (the 1988-1989 AIDS law); Connecticut, Georgia, Massachusetts, the District of Columbia, Mississippi, and Montana are omitted because each still had a law in place as of 2002.

3. Marriage License Data from 1981-1995 are from the Vital Statistics Marriage and Divorce Detail Files and are available at http://www.nber.org/data/marrdivo.html. States that do not report marriage license data include Arizona, Arkansas, Nevada, New Mexico, North Dakota, Oklahoma, Texas, and Washington.

Marriage rates, including those by race, are created using population estimates from the United States Census Bureau: http://www.census.gov/popest/states/. These population estimates are also used when weighting the data by state population.

4. Birth Certificate Data (the Natality Detail Files) for 1980-2002 are from the Center for Disease Control's National Center for Health Statistics. They are available for download at http://www.nber.org/data/vital-statistics-natality-data.html.

5. American Community Survey data for 2000-2005 and 5% and 1% PUMS Census data for 1990 and 2000 are available from http://www.census.gov.

6. Gonorrhea and syphilis rates used in Table 1 were constructed using disease prevalence from the Center for Disease Control and state population data from the Census Bureau.

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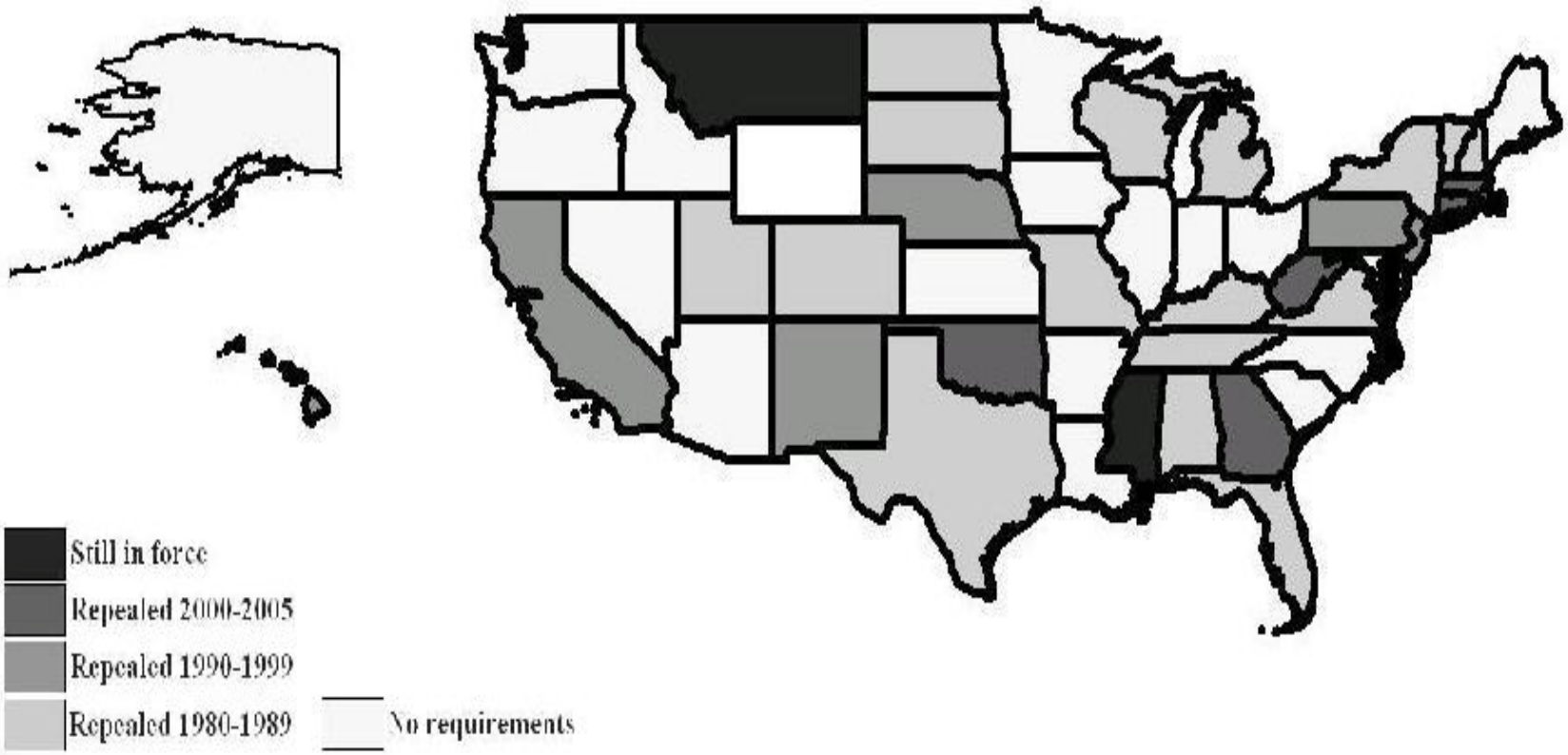
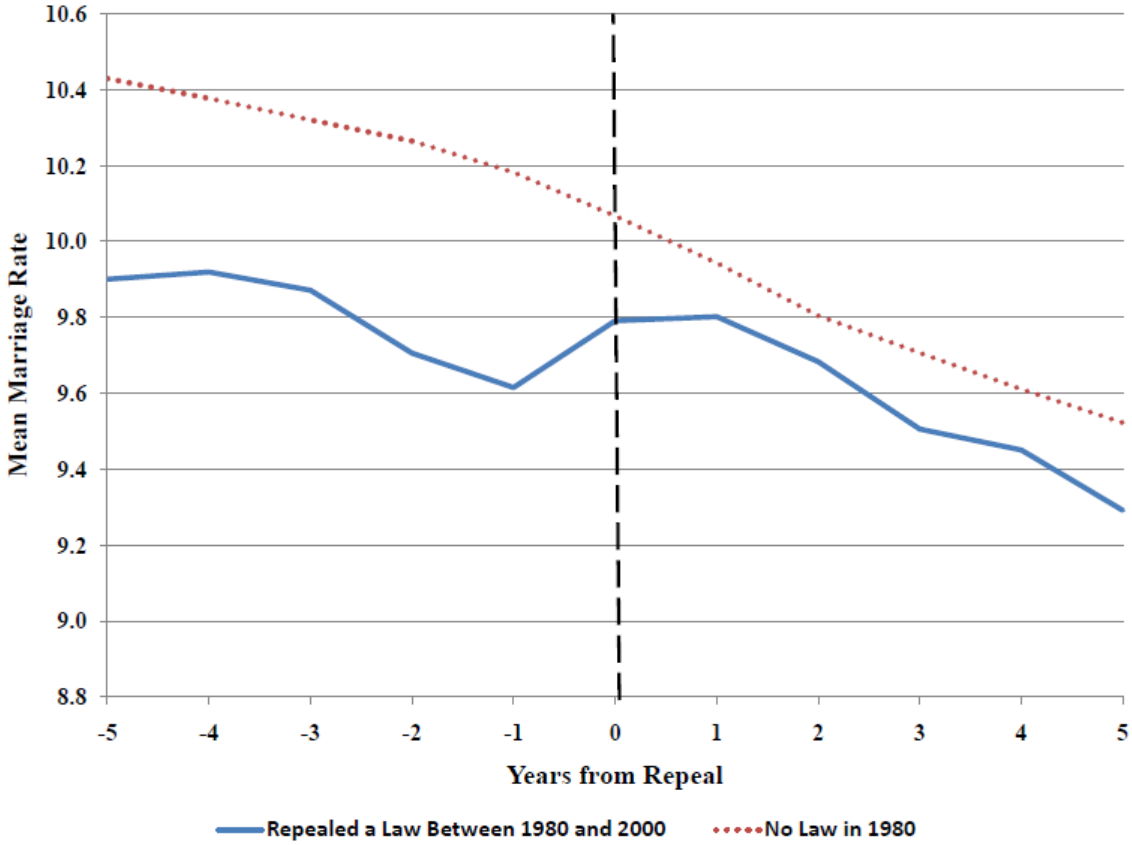
Figure 1. Timing of Blood Test Requirement Repeals 1980-2006



Source: State Statute Books.

Figure 2. Effect of Blood Test Requirement Repeal on Marriage Licenses Issued



Source: CDC reports of state marriage rates, 1975-2005. The solid line is the average marriage rate for the 23 states who had a blood test requirement in place in 1980 but who repealed the law by 2000. The data for each state is centered at the year the law was repealed. The dotted line corresponds to the 17 states that did not have a blood test requirement in 1980, where the mean marriage rate t years from repeal is calculated using an average of marriage rates in years in which a law was repealed in another state, following Ayers and Levitt (1998). Eleven states are not included in the figure for reasons addressed in the data appendix. Observations are weighted by state population.

Table 1. Estimated Probit Models for the Repeal of a Blood Test Requirement

	[1]	[2]	[3]
Marriage Rate $_{t-1}$	0.0255	0.0568	0.0455
	(0.0460)	(0.0507)	(0.1145)
	[0.0038]	[0.0074]	[0.0055]
Gonorrhea Rate $_{t-1}$		-0.0002	-0.0005
		(0.0006)	(0.0007)
		[-0.0000]	[-0.0001]
Syphilis rate $_{t-1}$		-0.0176	-0.0156
		(0.0157)	(0.0168)
		[-0.0023]	[-0.0019]
t			-0.2378
			(0.2417)
			[-0.0285]
t^2			0.0137
			(0.0092)
			[0.0016]
Marriage Rate $_{t-1}$ **x** t			0.0266
			(0.0280)
			[0.0032]
Marriage Rate $_{t-1}$ **x** t^2			-0.0016
			(0.0012)
			[-0.0002]
Pseudo R^2	0.0016	0.0325	0.0558
Observations	338	338	338

All coefficients are insignificant at the 10% level. The dependent variable is equal to one if the state repealed a blood test requirement in that year and zero otherwise. Standard errors are clustered at the state level and are in parenthesis, changes in probabilities are in brackets. Observations are at the state-year level and states exit the sample once a law is repealed. Marriage rates are from CDC reports, defined as the number of marriage licenses issued per 1,000 people. STD rates are from the CDC, defined as the number of instances per 100,000 people. Nevada and Hawaii are dropped from all specifications because of high marriage rates (52.8 and 22.3 respectively in 2006). California is dropped because of a policy that allowed residents to obtain confidential marriage licenses that did not require a blood test. Observations are weighted by state population.

Table 2. Effect of Blood Test Laws on Number of Marriage Licenses Issued by the State, per 1,000 State Residents

	All	Omit CA	All	Omit CA
1980-1995:				
Blood Test Requirement	-0.5103* (0.2613)	-0.6234** (0.2725)	-0.4470** (0.1789)	-0.4888** (0.1949)
Average Marriage Rate [std. dev.]	9.38 [1.91]	9.55 [1.93]	8.79 [1.92]	9.00 [1.90]
1996-2006:				
Blood Test Requirement	-0.7895** (0.1389)	-0.8466** (0.1317)	-0.5672** (0.2187)	-0.5697** (0.2127)
Average Marriage Rate [std. dev.]	7.56 [1.66]	7.75 [1.69]	7.56 [1.66]	8.17 [1.86]
1980-2006:				
Blood Test Requirement	-0.4783** (0.1829)	-0.5981** (0.1931)	-0.3675** (0.1773)	-0.5447** (0.1624)
Average Marriage Rate [std. dev.]	8.57 [2.02]	8.76 [2.03]	8.57 [2.02]	8.76 [2.03]
State and Year Fixed Effects	Yes	Yes	Yes	Yes
State-Specific Time Trends	No	No	Yes	Yes

* Indicates significance at 10%; ** indicates significance at 5%. Each coefficient is from a separate regression, where the coefficient is on a dummy indicating whether the state had a blood test requirement in place for the entire year. Standard errors are clustered at the state level and are in parenthesis. Observations are at the state-year level and data are from CDC reports of state marriage rates, defined as the number of marriage licenses issued per 1,000 people. Nevada and Hawaii are dropped from all specifications because of high marriage rates (52.8 and 22.3 respectively in 2006). California is dropped from the second and fourth specifications because of a policy that allowed residents to obtain confidential marriage licenses that did not require a blood test. Observations are weighted by state population.

Table 3. Effect of Blood Test Laws on Number of Marriages per 1,000 State Residents

	All	White	Black	Other
By Groom's State of Residence	-0.2585** (0.1009)	-0.3403** (0.1117)	-0.4809 (0.7051)	-0.1818** (0.0737)
By Groom's State, Age<30 Only	-0.3175* (0.1859)	-0.6227** (0.1635)	-0.5567 (0.6393)	-0.1605* (0.0850)
By Bride's State of Residence	-0.2660** (0.1090)	-0.3367** (0.1246)	-0.4817 (0.6853)	-0.1938** (0.0767)
State and Year Fixed Effects	Yes	Yes	Yes	Yes
State-Specific Time Trends	Yes	Yes	Yes	Yes
Avg. Marriages per 1000 people, all ages [std. dev.]	9.10 [1.31]	9.62 [1.85]	7.86 [1.41]	2.42 [2.12]
# State-Year Cells	629	507	507	507

* Indicates significance at 10%; ** indicates significance at 5%. The dependent variable is number of observed marriages for state residents, per 1,000 residents. Standard errors are clustered at the state level and are in parenthesis. Observations are at the state-year level, and data are from Vital Statistics Marriage License Records for reporting states, from 1981-1995. For the regressions done by race, states are also omitted if race is not reported on the license. Maine is omitted in 1995 due to data errors. California is omitted because of a policy that allowed residents to obtain confidential marriage licenses that did not require a blood test. State-specific time trends are quadratic. Observations are weighted by state population.

Table 4. Effect of Blood Test Laws on Where Marriage License is Obtained

Panel A: Effect of Blood Test Laws on Fraction Marrying In State of Residence

	All	White	Black	Other
By Groom's State of Residence	-0.0273** (0.0133)	-0.0378** (0.0149)	-0.0409* (0.0203)	-0.1367* (0.0698)
By Groom's State, Age<30 Only	-0.0206** (0.0086)	-0.0243** (0.0111)	-0.0299 (0.0191)	-0.1355** (0.0520)
By Bride's State of Residence	-0.0261* (0.0130)	-0.0363** (0.0142)	-0.0418* (0.0216)	-0.1236* (0.0628)
State and Year Fixed Effects	Yes	Yes	Yes	Yes
State-Specific Time Trends	Yes	Yes	Yes	Yes
Mean by Groom's State, All Ages (std. dev.)	0.8624 [0.0922]	0.9031 [0.0611]	0.9085 [0.0812]	0.9183 [0.0944]
# State-Year Cells	629	507	507	507

Panel B: Effect of Blood Test Laws on Fraction Marrying in Adjoining State

	All	White	Black	Other
By Groom's State of Residence	0.0195 (0.0124)	0.0322** (0.0140)	0.0319 (0.0191)	0.1067* (0.0599)
By Groom's State, Age<30 Only	0.0147 (0.0090)	0.0211* (0.0116)	0.0221 (0.0167)	0.1196** (0.0524)
By Bride's State of Residence	0.0200 (0.0127)	0.0323** (0.0135)	0.0377* (0.0214)	0.0848** (0.0376)
State and Year Fixed Effects	Yes	Yes	Yes	Yes
State-Specific Time Trends	Yes	Yes	Yes	Yes
Mean by Groom's State, All Ages (std. dev.)	0.0891 [0.0838]	0.0633 [0.0632]	0.0672 [0.0828]	0.0464 [0.0873]
# State-Year Cells	629	507	507	507

* Indicates significance at 10%; ** indicates significance at 5%. Standard errors are clustered at the state level and are in parenthesis. Observations are at the state-year level, and data are from Vital Statistics Marriage License Records for reporting states, from 1981-1995. For the regressions done by race, states are also omitted if race is not reported on the license. Maine is omitted in 1995 due to data errors. California is omitted because of a policy that allowed residents to obtain confidential marriage licenses that did not require a blood test. State-specific time trends are quadratic. Observations are weighted by state population.

Table 5: Effects of Blood Test Laws on Likelihood of First-Time Mothers Ages 19+ Being Married at Time of Birth

	All Mothers	Black Mothers	<HS Degree	<25 years old
Blood Test	-0.004**	-0.002	-0.016**	-0.007**
	(0.002)	(0.003)	(0.005)	(0.003)
Black	-0.415**		-0.376**	-0.432**
	(0.011)		(0.023)	(0.013)
HS graduate	0.196**	0.140**		0.128**
	(0.007)	(0.005)		(0.006)
Age of Mother	0.024**	0.036**	0.020**	0.059**
	(0.001)	(0.001)	(0.001)	(0.002)
State and Year Fixed Effects	Yes	Yes	Yes	Yes
State-Specific Time Trends	Yes	Yes	Yes	Yes
# State-Year-Age-Race Cells	95549	39099	40425	25868
R^2	0.819	0.815	0.825	0.938
Mean Marriage Rate for Sample	0.7456	0.3518	0.4823	0.6038

* Indicates significance at 10%; ** indicates significance at 5%. Standard errors are clustered at the state level and are in parenthesis. The unit of observation is the state-year-age-race specific group, and data are from Natality Detail Files, 1980-2002.California is omitted because of a policy that allowed residents to obtain confidential marriage licenses that did not require a blood test. State-specific time trends are quadratic. Observations are weighted by cell size.

Table 6. Effects of Blood Test Laws on Current Relationship Status among Mothers Age 19+ Whose First Child was Born in the Last Three Years

	Married [mean=0.7726]	Cohabiting [mean=.0748]	Single [mean=0.1526]
Blood test	-0.0260**	-0.0113**	0.0373**
	(0.0060)	(0.0036)	(0.0048)
Age	0.0130**	-0.0056**	0.0000
	(0.0005)	(0.0003)	(0.0000)
Black	-0.3661**	0.0244**	0.3417**
	(0.0057)	(0.0028)	(0.0057)
Hispanic	-0.0533**	0.0045*	0.0488**
	(0.0086)	(0.0025)	(0.0070)
Other Race	-0.0358**	-0.0007	0.0365**
	(0.0058)	(0.0032)	(0.0035)
Less than HS degree	-0.1297**	0.0476**	0.0821**
	(0.0061)	(0.0027)	(0.0043)
College Degree	0.1264**	-0.0493**	-0.0771**
	(0.0035)	(0.0020)	(0.0018)
R^2	0.1733	0.0455	0.1331

* Indicates significance at 10%; ** indicates significance at 5%. Standard errors are clustered at the state level and are in parenthesis. Data are from the 1990 and 2000 Census (5% and 1% samples) and 2000-2005 American Community Survey. The sample includes the 688,934 women who are over 18, whose first child was born in the last three years, and who are not part of a three generation household. California is omitted because of a policy that allowed residents to obtain confidential marriage licenses that did not require a blood test. Includes state and year fixed effects and quadratic state-specific time trends. The blood test variable indicates whether a blood test was in place in that state in the year the first child was born. State-specific time trends are quadratic. Observations are weighted by state population.

Appendix

Table 7: Effect of Blood Test Laws on Number of Marriage Licenses Issued by the State, per 1,000 State Residents, with Placebo Law

	All	Omit CA	All	Omit CA
Panel A: 1980-1995				
Blood Test Requirement	-0.6263**	-0.5956**	-0.4626**	-0.5081**
	(0.2856)	(0.3194)	(0.1817)	(0.1968)
Placebo	0.2496	-0.0604	-0.1734	-0.3290**
	(0.3185)	(0.3061)	(0.1730)	(0.1449)
Panel B: 1996-2006:				
Blood Test Requirement	-0.8851**	-0.9184**	-0.5381**	-0.5454**
	(0.1931)	(0.1891)	(0.2088)	(0.2038)
Placebo	0.2024	0.1527	0.2740	0.2302
	(0.2911)	(0.2879)	(0.2775)	(0.2590)
Panel C: 1980-2006:				
Blood Test Requirement	-0. 6895**	-0.6900**	-0.4357**	-0.5403**
	(0.2381)	(0.2864)	(0.1433)	(0.1605)
Placebo	0.3203	0.1448	0.2396	-0.0189
	(0.2885)	(0.3149)	(0.2278)	(0.1950)
State and Year Fixed Effects	Yes	Yes	Yes	Yes
State-Specific Time Trends	No	No	Yes	Yes

* Indicates significance at 10%; ** indicates significance at 5%. For regression details and mean marriage rates, see notes to Table 1. For the regressions in this table, we add a placebo variable that is a two-year lead of the blood test variable.