The Effects of Same-Sex Marriage Laws
on Public Health and Welfare

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This paper analyzes the relationships among same-sex marriage bans, social attitudes toward gays and non-marital sex, and measures of public health and welfare. We hypothesize that same-sex marriage bans may foster intolerance for gays and increase the social costs of same-sex partnerships, which may raise incentives for risky homosexual behavior. We also hypothesize that same-sex marriage bans may codify and signal traditional family values, which may raise the benefits of heterosexual marriage and reduce incentives for non-marital sex. Using micro- and state-level data, we find evidence that same-sex marriage bans reduced tolerance for gays and increased the syphilis rate, a rough proxy for risky homosexual behavior. However, we find no consistent evidence that same-sex marriage bans impacted risky heterosexual behavior, marriage, or divorce.

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I. Introduction

Understanding the impact of laws and social attitudes on sexual behavior and family formation is vital to public health. In this paper, we investigate the effects of same-sex marriage laws on social attitudes toward gays and non-marital sex as well as on sexually transmitted infections, marriage, and divorce. Today, most U.S. states prohibit marriage between two people of the same sex. Policymakers have justified the laws on the basis of promoting social welfare. For example, Michigan's same-sex marriage ban reads:

"Marriage is inherently a unique relationship between a man and a woman. As a matter of public policy, this state has a special interest in encouraging, supporting, and protecting that unique relationship in order to promote, among other goals, the stability and welfare of society and its children" (Michigan Compiled Laws Annotated § 551.1).

Maine's ban reads:

"The union of one man and one woman joined in traditional monogamous marriage is of inestimable value to society; the State has a compelling interest to nurture and promote the unique institution of traditional monogamous marriage in the support of harmonious families… and ... the State has the compelling interest in promoting the moral values inherent in traditional monogamous marriage" (19-A Maine Revised Statutes § 650).

We hypothesize that same-sex marriage bans may affect public health and welfare in a number of ways. The bans may directly impact the spread of sexually transmitted infections (STIs) among gays by undermining the incentives to behave monogamously, and they may indirectly impact the spread of STIs among gays by fostering intolerant attitudes toward gays and increasing the stigma associated with homosexuality, which may raise incentives for risky behavior. Thus, the bans may increase the syphilis rate, a measure of risky homosexual behavior. In addition, we hypothesize that same-sex marriage bans may raise the social benefits of heterosexual marriage as well as the social costs of non-marital sex, perhaps by codifying traditional family norms and signaling the prevalence of traditional family values. Thus, the bans

may reduce the gonorrhea rate, a measure of risky heterosexual behavior, as well as increase the marriage rate and decrease the divorce rate.

With a state-level panel dataset from 1980 to 2008, we estimate the effects of same-sex marriage bans on syphilis, gonorrhea, marriage, and divorce. In the paper, syphilis is a proxy for risky homosexual behavior since 64% of all reported syphilis cases are attributable to men who have sex with men, and the rate of syphilis among men who have sex with men is more than 46 times that of other men and more than 71 times that of women (CDC, 2010a, 2010b). Gonorrhea is a proxy for risky heterosexual behavior because most cases of gonorrhea are attributable to sex between men and women (CDC, 1997). We employ four different sets of legal variables: a single indicator for whether same-sex marriage or civil union was prohibited by statute or constitutional amendment, indicators for whether same-sex marriage was prohibited only by statute or by both statute and constitutional amendment, indicators for whether only same-sex marriage was prohibited or both marriage and civil union, and indicators for whether same-sex marriage was prohibited less than three years ago, three or four years ago, five or six years ago, and so on. To complement the state panel analysis, we explore potential causal mechanisms at the individual level using the General Social Survey (GSS).

We employ several techniques for empirical estimation. In the individual-level analysis, we implement ordinary least squares (OLS) and two-stage least squares (TSLS). Laws and attitudes are interrelated, so it is especially crucial to account for endogeneity in order to estimate the effects of same-sex marriage bans on tolerance for gays and premarital sex. For this reason, we use a set of instruments based on the number and type of ballot measures: the annual number of popular referenda, citizen initiatives, and legislative referenda. We postulate that when the number of ballot measures is higher, the marginal cost of placing an additional measure on the

ballot may be lower and civic engagement and voter turnout may be higher, all of which may increase the probability that a same-sex marriage ban is passed. In the state panel analysis, we employ OLS, dynamic panel, and generalized method of moments models. We also run regressions with a set of binary indicators for the number of years before and after the passage of the bans to get a sense of whether there are time trends leading up to the laws and whether the effects of the laws are temporary or permanent, immediate or delayed.

In summary, we find pieces of evidence that point to the idea that same-sex marriage bans have affected public health and welfare and have done so through their intermediate effects on social attitudes. Using the individual-level data, we find that same-sex marriage bans lowered societal tolerance for sex between two persons of the same sex. Addressing the concern that same-sex marriage bans might be correlated with an omitted variable influencing a wide range of social attitudes, falsification tests verify that bans are unassociated with tolerance for interracial marriage. Using the state panel data, we find evidence that same-sex marriage bans increased syphilis, a measure of risky homosexual behavior, perhaps by fostering intolerant attitudes toward gays. This finding may be important because to some extent, risky homosexual behavior underlies the spread of HIV. However, estimates suggest that gonorrhea, a measure of risky heterosexual behavior, is unrelated to same-sex marriage bans. Moreover, we find no evidence that bans impacted the marriage rate and little evidence that they lowered the divorce rate.

This paper contributes to research on risky sexual behavior and STIs (e.g., Ahituv, Hotz, and Philipson, 1996; Cornwell and Cunningham, 2010a, 2010b; Francis and Mialon, 2008, 2010; Johnson and Raphael, 2009; Kremer, 1996; Landsburg, 2007; Oster, 2005, 2009; Philipson and Posner, 1994; Portelli, 2004) and to research on laws and attitudes (e.g., Alesina and Fuchs-Schündeln, 2007; Fong et al. 2006; Gallus et al., 2006; Jakobsson and Kotsadam, 2010; Khan

and Stinchcombe, 2010; Soss and Schram, 2007; Svallfors, 2010; Tang et al., 2003). It also contributes to a burgeoning literature on same-sex marriage laws. A number of studies examine the history and legal attributes of same-sex marriage laws (Brandenburg, 2005; Gonen, 2001; Koppelman, 2005; Kramer, 1997; Metzger, 2007; Ruskay-Kidd, 1997; Schacter, 2009; Schroeder, 2005), while other studies examine the politics and correlates of such laws (Burnett and Salka, 2009; Fleischmann and Moyer, 2009; McVeigh and Diaz, 2009; Soule, 2004).

Dee (2008) is the first study to rigorously evaluate the effects of same-sex marriage laws on STIs. Using panel data on European countries, Dee estimates the effect of the legalization of same-sex partnerships on the incidence of STIs and finds that same-sex marriage laws decreased the incidence of syphilis but not HIV or gonorrhea. He concludes that the evidence suggests that same-sex marriage laws may promote sexual fidelity. Focusing on the US, Langbein and Yost (2009) find that laws permitting same-sex marriage raised the marriage rate and lowered the abortion rate and percentage of children in female-headed households, while laws prohibiting same-sex marriage lowered the divorce rate, abortion rate, and percentage of children in female-headed households. While this study represents an advance, it uses data from only three years (1990, 2000, and 2004); does not estimate the effects of the laws on STIs; does not take advantage of available information about the laws, e.g., precise year of passage, whether they were prohibitions by statute or constitutional amendment, or whether they prohibited only same-sex marriage or both marriage and civil union; does not explore causal mechanisms, e.g., whether the laws influenced social attitudes; and does not investigate the potential dynamic effects of the laws.

Francis and Mialon (2010) examine the relationship between tolerance for gays and the spread of HIV. Using a panel of US states from the mid-1970s to the mid-1990s, they find that

tolerance is negatively associated with the HIV rate. Tolerance is quantified using the measure of attitudes toward homosexuals in the GSS. To complement the GSS measure, state bans on gay marriage or civil union are used as a proxy for intolerance. The HIV rate is estimated using data on the AIDS rate and the median number of years between HIV infection and the onset of AIDS, prior to the development of highly active antiretroviral therapy (HAART) in 1996. The authors also investigate the causal mechanisms potentially underlying the relationship between tolerance and HIV. They find evidence consistent with the theory that tolerance for homosexuals causes low-risk men to enter the pool of homosexual partners, as well as causes sexually active men to substitute away from underground, anonymous, and risky behaviors, both of which lower the HIV rate. However, the study is far from a rigorous evaluation of the effects of same-sex marriage bans. Many state bans on same-sex marriage were introduced in the post-HAART era, which the study does not analyze. The study does not take advantage of a wealth of information about the laws and does not investigate the potential dynamic effects of the laws.

The remainder of the paper is organized as follows. Section II discusses the theoretical framework. Section III describes the data and empirical strategy. Section IV presents and interprets the empirical results. Section V concludes.

II. Theory

In light of the theoretical and empirical insights of previous research, there are many reasons to believe that same-sex marriage bans may induce changes in behavior that impact public health and welfare, even if same-sex couples did not have the positive right to marry or enter into civil union prior to the passage of the bans. Theories may be classified into two general types: those that emphasize that laws influence behavior by directly modifying incentives and

those that emphasize that laws influence behavior through their impact on social attitudes or norms.

The first type of theories focuses on direct changes in costs and benefits. Dee (2008) argues that allowing same-sex marriage can alter the behavioral incentives of homosexuals who aspire to form long-term partnerships. He provides evidence that extending marriage to same-sex couples in Europe resulted in a significant reduction in syphilis, which bolsters the notion that same-sex marriage may raise the gains to forming a committed partnership and reduce the gains to engaging in sexual promiscuity. Conversely, same-sex marriage bans might undermine the incentives to behave monogamously by lowering the expectation that gays will be able to enjoy the economic and emotional benefits of marriage in the near future. By discouraging monogamy, same-sex marriage bans may accelerate the spread of STIs. Alternatively, same-sex marriage bans may affect gays' sense of self-worth or value of life by sending them the message that they are not equal to others or that they are not deserving of the rights enjoyed by others (Kawata, 2010). In the context of the HIV epidemic in Africa, Oster (2005, 2009) finds that the lower is the economic value of life, the greater is the willingness to participate in risky behavior. If this principle may be extended to self-worth, then marriage bans may raise the prevalence of risky sex and other risky activities among gays.

The second type of theories focuses on social attitudes or norms. Academic interest in the relationship between laws and attitudes has been growing steadily. Indeed, a number of recent empirical papers document evidence that laws influence attitudes (e.g., Alesina and Fuchs-Schündeln, 2007; Fong et al. 2006; Gallus et al., 2006; Jakobsson and Kotsadam, 2010; Soss and Schram, 2007; Svallfors, 2009; Tang et al., 2003). For example, Tang et al. (2003) find that a California smoke-free bar law increased support for smoke-free bars among patrons; Jakobsson

and Kotsadam (2010) find that a Norwegian law criminalizing prostitution made people's attitudes toward prostitution more negative in the capital; and Alesina and Fuchs-Schündeln (2007) find that the policy of German reunification caused attitudes about redistribution and state intervention among East Germans to converge to those of West Germans.

Theoretical research proposes the potential causal pathways by which laws may impact attitudes. Laws can affect social costs and benefits underlying the creation of social norms; codify as well as signal social values, which people may internalize to gain cooperation opportunities; signal the prevalence of certain attitudes, which may affect the behavior of those who are concerned with approval; and change social norms by providing a focal point (Carbonara, Parisi, and Wangnheim, 2008; Cooter, 1998; McAdams, 2000; McAdams and Rasmusen, 2007; Posner, 1998, 2000). Soss and Schram (2007) study the conditions under which a policy is likely to reshape public opinion. When a policy has salience to mass publics and takes sides in an existing societal conflict, mass change in attitudes is more likely. Hence, same-sex marriage bans may influence social attitudes towards homosexuality and heterosexuality by signaling socially-unacceptable and socially-acceptable behaviors, by magnifying the stigma associated with same-sex partnerships, and/or by conveying information about the prevalence of intolerance toward gays in society. Moreover, the conditions for significant change in attitudes are satisfied, because same-sex marriage bans take sides in an important societal conflict as well as exhibit high visibility.

Given that same-sex marriage bans might affect attitudes, it remains to establish the link between attitudes and behaviors that impact public health and welfare. By fostering intolerant attitudes toward gays and increasing the stigma associated with homosexuality, same-sex marriage bans may increase the spread of STIs, especially among gay men but also among

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heterosexuals. Intolerance may drive gays to depression and drug use, factors that according to the CDC contribute to high infection rates among men who have sex with men (CDC, 2002). Intolerance may also raise the incentives for gays to cluster in urban areas, which reduces search costs for partners and potentially increases the spread of STIs (Müller, 2002). By raising the social costs of same-sex partnerships, marriage bans may induce some men who have had male partners to have only female partners or no partners at all. If such men at the extensive margin of homosexual behavior are of "low-activity" type, as they exit the pool of same-sex partners, it is possible that the overall rate of STI transmission among gays might rise (Francis and Mialon, 2010; Kremer, 1996; Landsburg, 2007). Additionally, same-sex marriage bans may drive homosexual behavior underground causing gay men to substitute relatively safe, open, and socially-mediated interactions for relatively risky, secret, and socially-disconnected interactions (Francis and Mialon, 2010). Although perhaps only modestly, intolerant attitudes toward gays may increase the spread of STIs among heterosexuals by altering the behavior of bisexuals who constitute the bridge between the pools of same- and opposite-sex partners.

By codifying traditional family norms and signaling the prevalence of traditional family values, same-sex marriage bans may also raise the social benefits of heterosexual marriage as well as the social costs of non-marital sex, thus incentivizing other behaviors that may influence public health and welfare. As the costs of non-marital sex rise, the prevalence of non-marital sex among heterosexuals may decrease, which may reduce the spread of STIs, but if behavioral change among bisexuals tends to raise STIs among heterosexuals, the overall effect remains ambiguous. As the benefits of marriage rise, the marriage rate may increase, whereas the divorce rate may decrease. Moreover, same-sex marriage bans may raise the marriage rate by spurring

some gays and bisexuals to enter heterosexual marriages in order to circumvent mounting social intolerance, although this phenomenon is unlikely to play a significant role in the aggregate.

Lastly, it has been suggested in academic and policy forums that same-sex marriage bans may uphold the concept of marriage as an institution committed to procreation, child-rearing, and sexual fidelity (Girgis, George, and Anderson, 2010; George and Elshtain, 2006; Family Research Council, 2010a, 2010b). If men who have sex with men tend to have sexual partnerships of shorter duration than men who have sex with women, and if they tend to have greater propensity for infidelity, then permitting same-sex couples to marry might weaken expectations of marital fidelity generally, thereby increasing extra-marital sex, divorce, and the spread of STIs. Likewise, it has been argued that banning same-sex marriage may reinforce the association between marriage and procreation. If same-sex couples are less likely to have children than opposite-sex couples, and if they are less effective parents, then allowing same-sex couples to marry might undermine traditional norms of child-bearing and child-rearing in marriage. It has also been claimed that banning same-sex marriage might reinforce paternal commitment to children. Akerlof, Yellen, and Katz (1996) posit that the legalization of abortion and availability of contraception reduced norms of paternal involvement in child-rearing and raised out-of-wedlock births. By the same token, permitting same-sex marriage, particularly allowing two women to marry and raise children, may weaken the notion that children require both a mother and a father, which may further erode the norm that men should take responsibility in child-rearing. Thus, same-sex marriage bans may raise marriage and reduce divorce.

III. Data and Empirical Strategy

A. State Laws on Same-Sex Marriage and Civil Union

Today, 41 states prohibit marriage between two people of the same sex by statute, constitutional amendment, or both; 12 permit same-sex marriage or civil union; and 3 do not have any laws explicitly allowing or disallowing same-sex marriage or civil union. Taking advantage of legal resources (Lexis-Nexis Legal and Hein Online Session Laws Library), we reviewed state statutory law, constitutional law, and court decisions in order to compile a comprehensive database of state laws on same-sex marriage and civil union. Table 1 summarizes the history of these laws. The table lists the year of enactment for statutes prohibiting/allowing same-sex marriage/civil union, constitutional amendments prohibiting same-sex marriage/civil union, and supreme court rulings allowing same-sex marriage. Please refer to the Appendix for detailed legal references and notes. Table 1 illustrates that most states (38) currently have statutory bans on same-sex marriage, all of which were enacted since 1973. More than half of states (29) have constitutional bans on same-sex marriage, all of which were enacted since 1998. About half (26) have both statutory and constitutional bans. 19 states prohibit both same-sex marriage and civil union, while only 6 states allow civil union. Three states allow same-sex marriage by statute (District of Columbia, New Hampshire, Vermont) and three by court ruling (Connecticut, Iowa, Massachusetts). Only one of these laws was enacted prior to 2008.

In the empirical analysis investigating the effects of same-sex marriage bans, we employ four different sets of legal variables. The first, "any ban" (Regression A), is a binary indicator for whether a particular state in a particular year had prohibited same-sex marriage by statute or constitutional amendment. The second, "only statutory ban" and "both constitutional & statutory ban" (Regression B), consists of binary indicators for whether a particular state in a particular

year had prohibited same-sex marriage only by statute or by both statute and constitutional amendment. The third, "only marriage ban" and "both marriage & civil union ban" (Regression C), consists of binary indicators for whether a particular state in a particular year had prohibited only same-sex marriage or both marriage and civil union, either by statute or amendment. The fourth, "first two years after ban," "Years 3-4," "Years 5-6," and so on (Regression D), consists of binary indicators for whether a particular state in a particular year had enacted any same-sex marriage ban in the last two years, 3-4 years ago, and so on. We also have information about the percentage by which each constitutional ban passed. We gather this from a database maintained by the National Conference of State Legislatures (NCSL, 2010). Note that every ballot measure on same-sex marriage put to a public vote was approved. The extent by which the measures passed varied from 52% to 86%.

B. State Panel Dataset - Dependent Variables

Using a state-level panel dataset from 1980 to 2008, our primary objective is to estimate the effect of same-sex marriage bans on health and welfare as measured by STIs, marriage, and divorce. The top panel of Table 3 displays summary statistics for the variables. Except in the table of summary statistics and robustness checks, all dependent variables are logged. We take logs in order to normalize the distributions of the dependent variables, a practice that follows the emerging precedent in the STI literature (e.g., Carpenter, 2005; Chesson et al., 2000; Cornwell and Cunningham, 2010a, 2010b; Dee, 2008). In any case, we report the non-logged results in robustness tables.

Three infectious diseases are dependent variables in the analysis: the number of syphilis cases per 100,000 population (CDC, 2009), the number of gonorrhea cases per 100,000

population (CDC, 2009), and the number of tuberculosis cases per 100,000 population (CDC, 2010c). Syphilis is a rough proxy for risky homosexual behavior. Although CDC data on syphilis do not include transmission categories, estimates suggest that 64% of all reported syphilis cases are attributable to men who have sex with men, and the rate of syphilis among men who have sex with men is more than 46 times that of other men and more than 71 times that of women (CDC, 2010a, 2010b). Gonorrhea is a rough proxy for risky heterosexual behavior since most cases of gonorrhea are attributable to sex between men and women (CDC, 1997). Tuberculosis, a non-sexually transmitted infectious disease, is utilized in a falsification exercise. However, we do not have sufficient data on HIV. Most states did not start reporting HIV until the late 1990s, and many of the large states, including California, New York, and Illinois, did not begin to report HIV until 2001 or later (CDC, 1982-2008). The remaining dependent variables concern marriage and divorce: the number of marriages per 1,000 population and the number of divorces per 1,000 population (CDC, 1980-2008).

C. State Panel Dataset - Controls

All state panel regressions include state fixed effects, year effects, and are weighted by state population share. Many regressions also include state-specific linear time trends or state-specific linear and quadratic time trends. Robust standard errors are adjusted for clustering on states to correct for potential serial correlation (Bertrand, Duflo, and Mullainathan, 2004).

We include a number of state controls in the regressions. The percentage of people aged 25-49 who completed high school, the percentage who completed some college, and the percentage who completed college or more are controls for education, constructed using IPUMS-CPS (King et al., 2010). The percentage of working-age people in the labor force who were

unemployed and average real personal income are also constructed using IPUMS-CPS. The percentage urban, based on the Statistical Abstract of the United States, is interpolated between census years (US Census Bureau, 1980-2005). The percentage of the population that was black, the percentage between ages 15 and 29, and the percentage between ages 30 and 44 are derived from data provided by the US Census Bureau (2010). Since religious attitudes may influence the passage of same-sex marriage bans, sexual behavior, and marriage markets, we calculate from the GSS the percentage of people who believed the Bible was the literal word of God, the percentage of people who attended religious services nearly every week or more, and the percentage of people who were Protestant, Catholic, Jewish, and other religion (Davis et al., 2010).

We also add several controls to address specific alternative hypotheses. One potential concern is that other state laws may be related both to the passage of same-sex marriage bans and to marriage and sexual behavior. Table 2 summarizes the history of state laws regulating sex education in school and parental involvement in a minor's decision to have an abortion. In particular, we include in the regressions an indicator for whether a particular state in a particular year had a law that required sex education programs to stress abstinence. We also include indicators for whether a particular state in a particular year either had a law that required parental notification to legally perform an abortion upon a minor or had a law that required parental consent. Another concern is that the AIDS epidemic may influence both attitudes and risk behaviors. For this reason, we include the number of AIDS cases per 100,000 population, the principal AIDS statistic publicly reported at the state level (CDC, 1982-2008). Another concern is the possible cross-state migration of gay men in response to changes in laws or attitudes, which might subsequently impact STI rates. To address this issue, we gathered data from

historical editions of Damron Men's Travel Guide, the longest and most complete gay men's travel guide (Damron, 1980-1992, 1993-1998, 1999-2008). Thus, to account for the relative size of the gay population in a state, we include in the STI regressions the state share of total entries (e.g., gay bars, bookstores, restaurants, and churches) listed in the guide.

D. Individual-Level Dataset

To complement the state panel analysis, we explore the potential causal mechanisms underlying the relationship between same-sex marriage bans and measures of health and welfare at the individual level using the GSS, a nationally representative repeated cross-sectional survey of adults (Davis et al., 2010). The bottom panel of Table 3 displays summary statistics for the variables. We estimate from 1980 to 2008 the effect of same-sex marriage bans on attitudes toward gays and premarital sex. The GSS provides the longest and most consistent measure of society-wide attitudes towards gays. Gay tolerance equals one if a respondent believes sexual relations between two adults of the same sex is "not wrong at all" or "wrong only sometimes" and equals zero if a respondent believes it is "almost always wrong" or "always wrong" (Francis and Mialon, 2010). Tolerance for premarital sex is defined analogously. For a falsification exercise, we construct another dependent variable: tolerance toward interracial marriage. The main variable of interest is whether a respondent is living in a state with a same-sex marriage ban. State fixed effects, year effects, and controls for gender, race, age, education, marital status, religion, abstinence-stressed sex education laws, parental consent abortion laws, and parental notification abortion laws are included as well.

E. Empirical Strategy

We employ several estimation techniques. In the individual-level analysis, we implement ordinary least squares (OLS) and two-stage least squares (TSLS) models.

It is a legitimate concern that same-sex marriage bans may be endogenous. Laws and attitudes are interrelated, so it is especially crucial to account for endogeneity in order to estimate the effect of same-sex marriage bans on tolerance for gays and premarital sex. For this reason, we use a set of instruments based on the number and type of ballot measures: the annual number of popular referenda, citizen initiatives, and legislative referenda (NCSL, 2010). Data are complete for about half of states from 1980 and for all states from 1998. A popular referendum is a popular vote on an existing law placed on the ballot through a process initiated by citizens; a citizen initiative is a popular vote on a new law placed on the ballot through a process initiated by citizens; and a legislative referendum is a popular vote on a measure passed by the legislature and placed on the ballot through a process initiated by the legislature or required by the constitution. The subject of ballot measures ranges widely from taxes to marijuana. We postulate that when the number of ballot measures is relatively high, the marginal cost of placing an additional measure on the ballot is relatively low. Also, the number of ballot measures, especially those initiated by citizens, signals a period of particularly active civic engagement. During this period the legislature may be more likely to pass a statutory or constitutional same-sex marriage ban given that large numbers of citizens are paying attention to politics and going to the polls. Indeed, in the first stage of our TSLS regressions, when one or more of the instruments have a statistically significant effect on the passage of the bans, the effect is positive.

In the state panel analysis, we employ OLS, dynamic panel, and generalized method of moments models. Endogeneity of the laws may be less of a concern when the outcome variables

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are syphilis and other STIs. Investigating the effects of same-sex marriage laws on STIs in Europe, Dee (2008) argues that such laws were exogenous given that the public debates about them centered on issues of "fairness, equality, and morality" but not on issues of public health. Following the literature on infectious diseases (e.g., Dee, 2008; Chesson et al., 2000), we also employ dynamic panel and generalized method of moments specifications when the dependent variable is syphilis, gonorrhea, or tuberculosis. It may be important to introduce a lagged dependent variable as a regressor because the incidence of an infectious disease may depend on its prior incidence. Since the presence of a lagged dependent variable may create a bias when the length of the panel is short, it may be useful to implement a generalized method of moments technique like that developed by Arellano and Bond (1991) in order to address this possibility. Importantly, we also run regressions with a set of binary indicators for the number of years before and after the passage of the bans to get a sense of whether there are time trends leading up to the laws and whether the effects of the laws are temporary or permanent, immediate or delayed (Wolfers, 2006).

IV. Results and Discussion

A. Micro Evidence on Attitudes

Using the individual-level data, we investigate the link between same-sex marriage bans and social attitudes, given that theory indicates attitudes represent one of the main causal pathways through which laws may influence behavioral outcomes. To do so, we regress tolerance for gay sex and premarital sex on an indicator for whether an individual was living in a state that had a same-sex marriage ban. All specifications include state fixed effects, year effects, and a number of individual controls. We employ OLS as well as TSLS models using the annual

number of popular referenda, citizen initiatives, and legislative referenda as instruments. It may be important to account for endogeneity, since the passage of same-sex marriage laws may affect social attitudes, and social attitudes may affect the passage of same-sex marriage laws.

Table 4 displays the findings. In column (2) same-sex marriage bans are negatively and significantly associated with gay tolerance. Specifically, same-sex marriage bans tend to lower tolerance for gays by about 22 percentage points. The Kleibergen-Paap first-stage F statistic is higher than the Stock-Yogo critical value for 10% maximal IV relative bias, indicating that the instruments pass the Stock-Yogo strength test, and the p-value for the Hansen J statistic is higher than 0.10, indicating that the instruments pass the Sargan-Hansen exogeneity test. Although in column (4) same-sex marriage bans appear to lower tolerance for premarital sex by roughly 9 percentage points, the instruments do not pass the Stock-Yogo strength test.

The coefficients associated with the control variables are interesting as well. The regressions suggest that men are less likely than women to display tolerance for gays but are more likely to display tolerance for premarital sex. Whites are much more likely to express tolerance toward gays. Gay tolerance rises steadily with education, and tolerance for premarital sex falls at the lowest level of education and rises at the highest. Younger and never married respondents have significantly more tolerant attitudes generally.

However, a concern is that same-sex marriage bans might be correlated with an omitted variable influencing a wide range of social attitudes, including those related to non-marital sex. To address this possibility, we perform a falsification test: whether same-sex marriage bans are unassociated with tolerance for interracial marriage. Interracial marriage, like same-sex marriage, runs counter to traditional behavioral norms but relates to race, not sexual orientation. In column (6) the instruments pass the Stock-Yogo strength test and the Sargan-Hansen

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exogeneity test, and the coefficient on any same-sex marriage ban is not significant. All in all, Table 4 supports the notion that same-sex marriage bans significantly lowered societal tolerance for sex between two persons of the same sex.

B. State Panel Results with Figures

Using the state panel data, we estimate the effects of same-sex marriage bans on syphilis, gonorrhea, marriage, and divorce. Here, we focus exclusively on OLS models that incorporate state fixed effects, year effects, and a number of state-level controls. In the next subsection, the regressions vary by both model and ban type. To guide the interpretation of results, we also examine figures that illustrate trends in the dependent variables ten years before and ten years after the passage of same-sex marriage bans. To construct the figures, we regress each of the dependent variables (log rates) on a set of binary indicators for the number of years before and after a ban was enacted, state fixed effects, year effects, and controls. The figures depict the estimated change relative to the timing of same-sex marriage bans (the dotted lines denote confidence intervals).

Figures 1 and 2 show the changes in syphilis and gonorrhea. There was an upward trend in syphilis 5 to 10 years prior to the passage of the laws but the trend was relatively flat 1 to 5 years prior. Following enactment, syphilis rose and remained at a relatively elevated level. There was an unambiguous upward trend in gonorrhea throughout most of the period. Table 5 displays regressions of same-sex marriage bans on syphilis and gonorrhea. For syphilis, the coefficient on any same-sex marriage ban is positive and significant in each of the specifications, including those with linear and quadratic state-specific time trends. However, for gonorrhea, the coefficient on same-sex marriage ban is only significant without time trends. Considering that Figure 2

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underscores the necessity to include time trends, there is little evidence that bans have a significant effect on gonorrhea. The coefficients on a number of controls are significant, highlighting the role of AIDS, education, religion, employment, and population in determining the prevalence of risky sexual behavior.

Figures 3 and 4 show the changes in marriage and divorce. Marriage trended downward, reached its lowest point with the passage of same-sex marriage bans, and then trended upwards. Divorce exhibited roughly the same pattern but was right-shifted by two years. Table 6 displays regressions of same-sex marriage bans on marriage and divorce. For marriage, the coefficient on any same-sex marriage ban is not significant, and for divorce, the coefficient is only significant at the 10% level with linear time trends. Correlates of marriage include religion, unemployment, and population age, while correlates of divorce include education and church attendance.

C. Detailed State Panel Results by Model and Ban Type

We now examine the effects of same-sex marriage bans using various empirical models and various measures of ban type. Table 7 focuses on syphilis and gonorrhea. The most prominent result in the table is that having a ban on both same-sex marriage and civil union significantly raises the syphilis rate. This is undoubtedly the strongest type of ban because it denies same-sex couples access not only to marriage but also to any legal status analogous to marriage. Furthermore, a number of OLS and dynamic panel models indicate that the enactment of any type of ban significantly increases syphilis. In contrast to syphilis, there is little evidence that same-sex marriage bans affect the gonorrhea rate, since most of the specifications yield insignificant coefficients.

Table 8 displays the results of falsification tests that confirm that the passage of bans did not affect all infectious diseases. The regressions demonstrate that same-sex marriage bans had no relation to tuberculosis. Table 9 focuses on marriage and divorce. None of the coefficients on the ban variables are significant when the dependent variable is the marriage rate. The results for divorce vary considerably depending on whether linear time trends are included. With linear time trends, all of the coefficients on the ban variables are negative and significant, but with quadratic trends or no trends at all, none of the coefficients are significant.

We also have information about the margin by which the constitutional bans passed. Note that voter approval ranged from 52% to 86%. It may be helpful to see whether the effect of the passage of a constitutional ban relates to the percentage by which it passed. Table 10 presents the results. The coefficients on "only statutory ban" are consistent with those we found in Tables 7 and 9. Additionally, the sign and significance of the coefficients on "vote in favor of constitutional ban" closely mirror those on "both constitutional and statutory ban" in Tables 7 and 9. Interestingly, the findings suggest that the percentage by which a constitutional ban passed is positively associated with syphilis. However, while informative, this exercise is not ideal because every ballot measure on same-sex marriage put to a public vote was approved.

To investigate the dynamic effects of the laws—whether the effects are temporary or permanent, immediate or delayed—we regress each of the dependent variables on a set of binary variables indicating the number of years since the passage of a same-sex marriage ban. Table 11 displays the results. The evidence suggests that bans have a statistically significant effect on syphilis, while they have no effect on gonorrhea and tuberculosis. The impact on syphilis is persistent in the short and medium term. The results confirm that bans have little impact on the

marriage rate but imply that they might influence the divorce rate, although the pattern of significance is not robust across specifications.

Tables 12 and 13 explore the robustness of the dynamic effects with respect to the logarithm of the dependent variables, the inclusion of California (the state with the largest gay population), and the inclusion of DC (the extreme outlier in STI incidence). For syphilis, while the coefficients on the ban variables are positive, they are not significant when the dependent variable is not logged. However, this may not be worrisome given that taking logs to normalize the distribution of the syphilis rate is a practice consistent with the STI literature. The coefficients are insignificant with the exclusion of California in specifications with state time trends, which may reflect that men who have sex with men indeed play a critical role in the relationship between marriage bans and syphilis. As before, the estimated coefficients indicate that same-sex marriage bans have no effect on gonorrhea, no effect on marriage, and an effect on divorce only with the inclusion of linear time trends.

V. Conclusion

In this paper, we have presented pieces of evidence that point to the idea that same-sex marriage bans have affected public health and welfare and have done so through their intermediate effects on social attitudes.

Using individual-level data, we found that same-sex marriage bans lowered societal tolerance for non-marital sex, especially sex between two persons of the same sex, perhaps by signaling socially-acceptable and socially-unacceptable behaviors, magnifying the stigma associated with same-sex partnerships, and/or conveying information regarding the prevalence of intolerance in society. Using state panel data, we found evidence that same-sex marriage bans

increased syphilis, a rough proxy for risky homosexual behavior, perhaps by fostering intolerant attitudes toward gays and increasing the stigma associated with homosexuality. This finding may be important because risky homosexual behavior is a factor underlying the spread of HIV. However, our estimates suggested that same-sex marriage bans had no significant impact on gonorrhea, no effect on marriage, and little consistent effect on divorce.

Nevertheless, these results are only suggestive. Future research may be able to use stronger instruments and high-frequency data from key states to better identify the effects of same-sex marriage bans as well as use evidence on causal mechanisms to distinguish among the possible theories.

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Figure 1
Estimated Change in Syphilis Rates Relative to Timing of Same-Sex Marriage Bans

Figure 2
Estimated Change in Gonorrhea Rates Relative to Timing of Same-Sex Marriage Bans

Figure 3
Estimated Change in Marriage Rates Relative to Timing of Same-Sex Marriage Bans

Figure 4
Estimated Change in Divorce Rates Relative to Timing of Same-Sex Marriage Bans
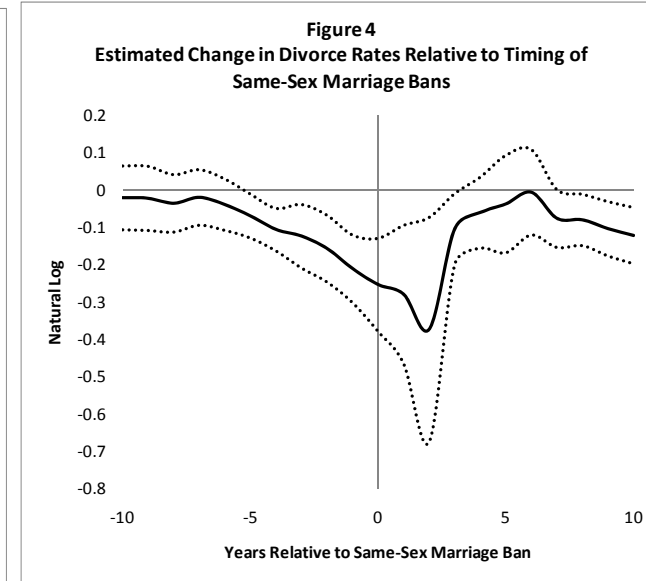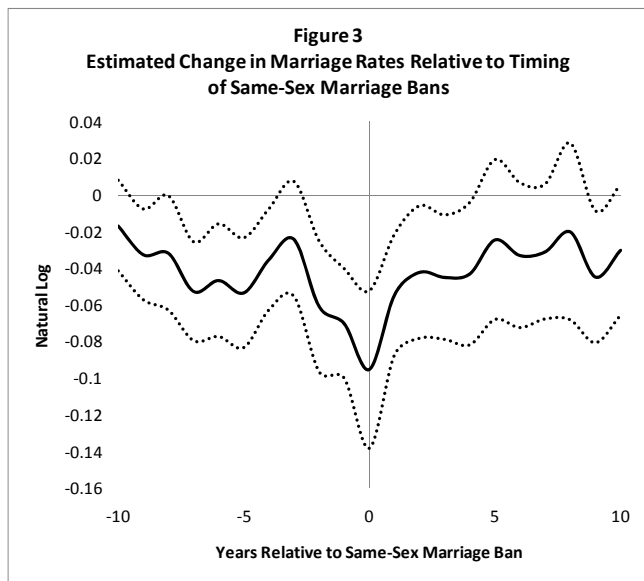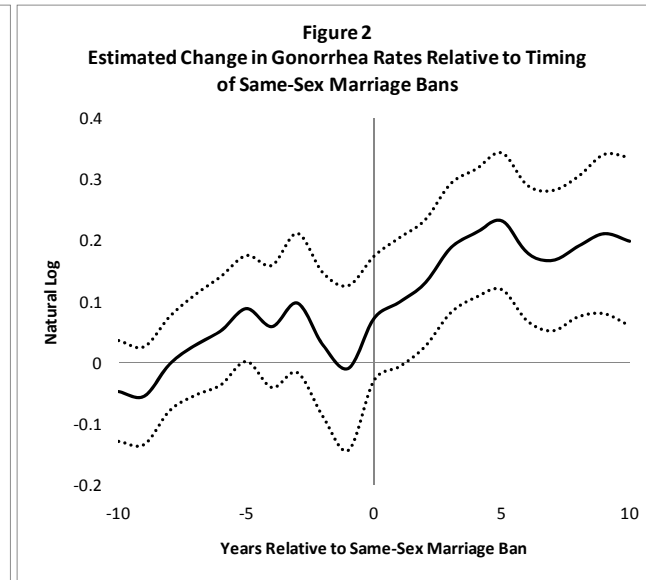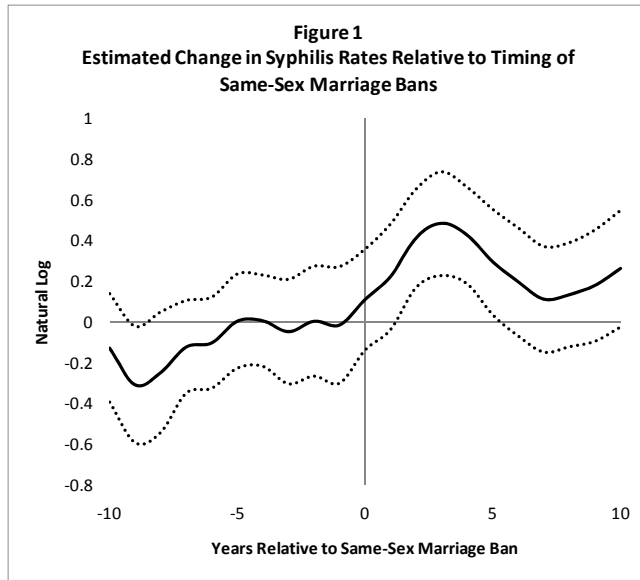
Table 1
State Laws on Same-Sex Marriage and Civil Union

State	STATE STATUTES				STATE CONSTITUTIONAL AMENDMENTS		STATE SUPREME COURT RULINGS
	Prohibit Marriage	Prohibit Civil Union	Allow Marriage	Allow Civil Union	Prohibit Marriage	Prohibit Civil Union	Allow Marriage
Alabama	1998				2006	2006	
Alaska	1996	1996			1998		
Arizona	1996				2008		
Arkansas	1997				2004	2004	
California	2000-2008			2003	2008		
Colorado	2000				2006		
Connecticut	2000-2007			2005-2008			2008
Delaware	1996						
DC			2010	2002-2010			
Florida	1977				2008	2008	
Georgia	1996	1996			2004	2004	
Hawaii	1994			2011			
Idaho	1996				2006		
Illinois	1996						
Indiana	1997						
Iowa	1998-2008						2009
Kansas	1996				2005	2005	
Kentucky	1998				2004	2004	
Louisiana	1988	1988			2004	2004	
Maine	1997						
Maryland	1973						
Massachusetts							2003
Michigan	1996				2004	2004	
Minnesota	1997						
Mississippi	1997				2004		
Missouri	1996-98, 2001				2004		
Montana	1997	1997			2004		
Nebraska					2000	2000	
Nevada				2009	2002		

Table 1
State Laws on Same-Sex Marriage and Civil Union (continued)

State	STATE STATUTES				STATE CONSTITUTIONAL AMENDMENTS		STATE SUPREME COURT RULINGS
	Prohibit Marriage	Prohibit Civil Union	Allow Marriage	Allow Civil Union	Prohibit Marriage	Prohibit Civil Union	Allow Marriage
New Hampshire	1987-2008		2009	2007-2009			
New Jersey				2006			
New Mexico							
New York							
North Carolina	1995						
North Dakota	1997				2004	2004	
Ohio	2004	2004			2004	2004	
Oklahoma	1975				2004		
Oregon	1975			2007	2004		
Pennsylvania	1996						
Rhode Island							
South Carolina	1996				2006	2006	
South Dakota	1996				2006	2006	
Tennessee	1996				2006		
Texas	1997	2003			2005	2005	
Utah	1977	2004			2004	2004	
Vermont	2000-2008		2009	1999-2009			
Virginia	1997	2004			2006	2006	
Washington	1998			2009			
West Virginia	2000						
Wisconsin	1979				2006	2006	
Wyoming	1977						

NOTE. Please see Appendix for legal references and notes.

Table 2
State Sex Education and Parental Involvement Abortion Laws

State	SEX EDUCATION LAWS	PARENTAL INVOLVEMENT ABORTION LAWS		State	SEX EDUCATION LAWS	PARENTAL INVOLVEMENT ABORTION LAWS	
	Abstinence-Stressed	Consent	Notification		Abstinence-Stressed	Consent	Notification
Alabama	1992	1987		Montana			1995
Alaska		1997		Nebraska			1991
Arizona	1991	1996	1982	Nevada			1981-1991
Arkansas	1993	2005	1985	New Hampshire			
California		1987-1997		New Jersey	2002		1999-2000
Colorado	2007		1998	New Mexico	2005	1969-1973	
Connecticut				New York	1992		
Delaware	2000		1995	North Carolina	1995	1995	
DC				North Dakota		1981	
Florida	2002		1999	Ohio	1999	1974	
Georgia			1987	Oklahoma	1987	2001	2001
Hawaii				Oregon	1993		
Idaho		2000	1982	Pennsylvania	2008	1982	
Illinois	1989	1977-1995	1995	Rhode Island	1987	1982	
Indiana	1988	1984		South Carolina	1988	1990	
Iowa			1996	South Dakota	1991		1972
Kansas			1992	Tennessee	1987	1988	
Kentucky		1982		Texas	1995	1999	1999
Louisiana	1987	1978		Utah	1993	1974	1974
Maine	2001	1986		Vermont			
Maryland			1982-1985	Virginia			
Massachusetts		1980		Washington	2008		
Michigan	2004	1991		West Virginia			1984
Minnesota			1971	Wisconsin	2005	1991	
Mississippi	1998	1986		Wyoming		1989	1989
Missouri	1999	1979					

Table 3
Summary Statistics

Variable	Available Years	Sample Size	Mean	Standard Deviation
STATE PANEL DATASET				
Syphilis cases per 100,000 population	1981-2008	1372	13.72	25.14
Gonorrhea cases per 100,000 population	1981-2008	1372	405.02	477.20
Marriages per 1,000 population	1980-2008	1421	9.07	2.55
Divorces per 1,000 population	1980-2008	1366	4.51	1.34
AIDS cases per 100,000 population	1980-2008	1421	11.53	21.97
High school %	1980-2008	1421	37.17	6.26
Some college %	1980-2008	1421	24.99	6.13
College %	1980-2008	1421	26.26	6.20
Bible literal word of God %	1980-2008	1421	37.30	26.05
Church attendance nearly every week or more %	1980-2008	1421	38.95	22.51
Protestant %	1980-2008	1421	60.89	25.15
Catholic %	1980-2008	1421	26.14	23.76
Jewish %	1980-2008	1421	1.28	3.72
Other religion %	1980-2008	1421	6.98	15.19
State share of entries in Damron %	1980-2008	1421	2.01	2.65
Unemployment %	1980-2008	1421	6.40	2.30
Average real personal income	1980-2008	1421	18041.76	3090.94
Black %	1980-2008	1421	11.26	12.10
Urban %	1980-2008	1421	70.24	15.34
Population aged 15-29 %	1980-2008	1421	22.89	2.75
Population aged 30-44 %	1980-2008	1421	22.34	2.18
INDIVIDUAL-LEVEL DATASET				
Gay tolerance	1980-2008	24588	0.29	0.45
Tolerance for premarital sex	1982-2008	23521	0.64	0.48
Male	1980-2008	24588	0.44	0.50
White	1980-2008	24588	0.80	0.40
Black	1980-2008	24588	0.15	0.36
Age	1980-2008	24515	45.62	17.59
Less than high school	1980-2008	24520	0.21	0.41
Junior college	1980-2008	24520	0.06	0.23
College	1980-2008	24520	0.14	0.35
Graduate	1980-2008	24520	0.07	0.25
Widowed	1980-2008	24578	0.10	0.30
Divorced	1980-2008	24578	0.13	0.34
Separated	1980-2008	24578	0.04	0.19
Never married	1980-2008	24578	0.22	0.41
Protestant	1980-2008	24522	0.60	0.49
Catholic	1980-2008	24522	0.24	0.43
Jewish	1980-2008	24522	0.02	0.13
No religion	1980-2008	24522	0.10	0.30

Table 4
The Effects of Same-Sex Marriage Bans on Tolerance (Individual-Level Data)

Variable	Gay tolerance OLS (1)	Gay tolerance TSLS (2)	Tolerance for premarital sex OLS (3)	Tolerance for premarital sex TSLS (4)	Tolerance for Interracial Marriage OLS (5)	Tolerance for Interracial Marriage TSLS (6)
Any same-sex	-0.021	-0.223	0.012	-0.092	0.021	0.027
marriage ban	(0.014)	(0.095) **	(0.013)	(0.056) *	(0.016)	(0.046)
Abstinence-stressed	-0.005	-0.011	-0.003	-0.014	-0.016	0.005
sex education law	(0.014)	(0.025)	(0.011)	(0.015)	(0.016)	(0.020)
Parental consent	-0.027	-0.018	0.003	0.000	0.009	0.003
abortion law	(0.013) **	(0.027)	(0.010)	(0.013)	(0.008)	(0.008)
Parental notification	0.029	0.023	0.043	0.041	0.018	0.003
abortion law	(0.014) **	(0.045)	(0.017) **	(0.014) **	(0.016)	(0.017)
Male	-0.070	-0.075	0.081	0.073	0.007	0.004
	(0.007) **	(0.009) **	(0.009) **	(0.009) **	(0.005)	(0.006)
White	0.097	0.105	0.089	0.095	-0.032	-0.031
	(0.015) **	(0.014) **	(0.012) **	(0.014) **	(0.008) **	(0.007) **
Black	0.013	0.002	0.077	0.052	0.178	0.137
	(0.011)	(0.014)	(0.013) **	(0.019) **	(0.025) **	(0.020) **
Age	-0.003	-0.003	-0.006	-0.005	-0.004	-0.004
	(0.000) **	(0.000) **	(0.000) **	(0.000) **	(0.000) **	(0.000) **
Less than high school	-0.048	-0.062	-0.045	-0.044	-0.133	-0.107
	(0.011) **	(0.014) **	(0.010) **	(0.012) **	(0.013) **	(0.014) **
Junior college	0.065	0.052	0.020	0.003	0.053	0.043
	(0.014) **	(0.013) **	(0.014)	(0.014)	(0.010) **	(0.012) **
College	0.139	0.136	0.018	0.006	0.108	0.088
	(0.009) **	(0.010) **	(0.010) *	(0.010)	(0.012) **	(0.013) **
Graduate	0.244	0.232	0.081	0.061	0.137	0.120
	(0.015) **	(0.018) **	(0.015) **	(0.015) **	(0.015) **	(0.013) **
Widowed	0.012	0.016	0.032	0.011	-0.027	-0.043
	(0.008)	(0.010)	(0.010) **	(0.012)	(0.009) **	(0.012) **
Divorced	0.082	0.087	0.148	0.137	0.011	0.005
	(0.011) **	(0.013) **	(0.010) **	(0.011) **	(0.007)	(0.008)
Separated	0.058	0.050	0.134	0.120	0.010	-0.024
	(0.015) **	(0.016) **	(0.023) **	(0.026) **	(0.013)	(0.017)
Never married	0.088	0.100	0.038	0.040	-0.011	-0.019
	(0.010) **	(0.011) **	(0.010) **	(0.012) **	(0.007) *	(0.006) **
Protestant	-0.083	-0.083	-0.018	-0.039	-0.030	-0.031
	(0.018) **	(0.020) **	(0.019)	(0.022) *	(0.009) **	(0.010) **
Catholic	-0.032	-0.026	0.094	0.093	0.007	-0.006
	(0.017) *	(0.019)	(0.019) **	(0.020) **	(0.009)	(0.010)
Jewish	0.256	0.259	0.220	0.230	0.053	0.038
	(0.030) **	(0.042) **	(0.035) **	(0.029) **	(0.012) **	(0.012) **
No religion	0.189	0.192	0.211	0.211	0.009	0.010
	(0.019) **	(0.022) **	(0.015) **	(0.018) **	(0.009)	(0.011)
N	24388	17316	23311	16860	20780	13646
R-squared	0.207	0.120	0.159	0.106	0.215	0.109
Kleibergen-Paap F statistic		9.45		6.34		11.41
Stock-Yogo 10% max IV relative bias		9.08		9.08		9.08
Hansen J statistic P-value		0.981		0.822		0.498

NOTE. All specifications include state fixed effects and year effects. Numbers in parentheses are robust standard errors adjusted for clustering on states. A double asterisk indicates significance at the 5% level, and a single asterisk indicates significance at the 10% level.

Table 5
The Effects of Same-Sex Marriage Bans on Syphilis and Gonorrhea (State Panel Data)

Variable	Syphilis rate			Gonorrhea rate		
	(1)	(2)	(3)	(4)	(5)	(6)
Any same-sex marriage ban	0.311	0.406	0.277	0.122	0.054	0.010
	(0.137) **	(0.165) **	(0.136) **	(0.062) *	(0.073)	(0.049)
Abstinence-stressed sex education law	-0.192	-0.187	-0.408	0.074	0.058	-0.002
	(0.135)	(0.157)	(0.177) **	(0.062)	(0.054)	(0.036)
Parental consent abortion law	-0.085	0.023	0.212	-0.090	-0.038	0.068
	(0.130)	(0.144)	(0.129)	(0.054)	(0.053)	(0.042)
Parental notification abortion law	-0.272	-0.102	-0.152	-0.013	0.006	-0.041
	(0.121) **	(0.169)	(0.201)	(0.062)	(0.072)	(0.048)
AIDS rate	-0.018	-0.018	-0.011	0.001	0.002	0.000
	(0.007) **	(0.006) **	(0.007)	(0.002)	(0.002)	(0.002)
High school	0.036	0.069	0.018	0.017	0.030	0.012
	(0.017) **	(0.023) **	(0.025)	(0.009) *	(0.009) **	(0.009)
Some college	0.045	0.068	0.034	0.031	0.032	0.018
	(0.020) **	(0.025) **	(0.026)	(0.009) **	(0.012) **	(0.012)
College	0.038	0.066	0.022	0.022	0.021	0.006
	(0.019) *	(0.024) **	(0.023)	(0.009) **	(0.010) **	(0.009)
Bible word of God	-0.001	0.000	0.001	-0.002	-0.002	0.000
	(0.002)	(0.002)	(0.003)	(0.001) **	(0.001) **	(0.001)
Church attendance	-0.008	-0.009	-0.006	-0.001	-0.001	0.000
	(0.003) **	(0.003) **	(0.002) **	(0.001)	(0.001)	(0.001)
Protestant	0.002	0.003	0.000	0.002	0.002	-0.000
	(0.004)	(0.006)	(0.006)	(0.002)	(0.002)	(0.002)
Catholic	0.002	0.000	-0.000	0.000	0.000	-0.002
	(0.004)	(0.006)	(0.007)	(0.002)	(0.002)	(0.002)
Jewish	-0.024	-0.021	-0.016	-0.008	-0.008	-0.007
	(0.009) **	(0.010) **	(0.009) *	(0.004) **	(0.005) *	(0.004) *
Other religion	0.004	0.006	-0.002	0.002	0.001	-0.004
	(0.005)	(0.011)	(0.012)	(0.003)	(0.005)	(0.004)
State Damron share	-0.026	-0.020	-0.192	-0.038	0.003	-0.054
	(0.062)	(0.041)	(0.069) **	(0.036)	(0.017)	(0.026) **
Unemployment	-0.112	-0.093	-0.064	-0.048	-0.036	-0.027
	(0.025) **	(0.026) **	(0.023) **	(0.010) **	(0.011) **	(0.007) **
Real income	0.000	0.000	0.000	-0.000	0.000	0.000
	(0.000) **	(0.000)	(0.000) **	(0.000)	(0.000)	(0.000)
Black	0.138	0.262	0.273	0.057	0.079	0.063
	(0.077) *	(0.111) **	(0.226) *	(0.025) **	(0.050)	(0.055)
Urban	-0.026	-0.030	-0.159	-0.011	-0.046	-0.058
	(0.023)	(0.057)	(0.181) *	(0.010)	(0.029)	(0.037)
Pop 15-29	0.214	0.406	0.352	0.036	0.078	0.034
	(0.061) **	(0.085) **	(0.102) **	(0.020) *	(0.030) **	(0.023)
Pop 30-44	0.075	0.329	0.399	0.070	0.081	0.021
	(0.084)	(0.148) **	(0.139) **	(0.041) *	(0.057)	(0.046)
N	1317	1317	1317	1372	1372	1372
R-squared	0.819	0.849	0.880	0.919	0.939	0.960
State-Specific Trend	No	Yes	Yes	No	Yes	Yes
State-Specific Trend^2	No	No	Yes	No	No	Yes

NOTE. All dependent variables are logged. All specifications include state fixed effects, year effects, and are weighted by state population share. Numbers in parentheses are robust standard errors adjusted for clustering on states. A double asterisk indicates significance at the 5% level, and a single asterisk indicates significance at the 10% level.

Table 6
The Effects of Same-Sex Marriage Bans on Marriage and Divorce

Variable	Marriage rate			Divorce rate		
	(1)	(2)	(3)	(4)	(5)	(6)
Any same-sex marriage ban	-0.007	0.007	-0.002	-0.094	-0.159	-0.067
	(0.024)	(0.019)	(0.021)	(0.068)	(0.081) *	(0.049)
Abstinence-stressed sex education law	0.031	0.022	0.035	0.040	0.022	-0.001
	(0.022)	(0.014)	(0.016) **	(0.056)	(0.028)	(0.016)
Parental consent abortion law	-0.020	-0.003	0.034	0.179	0.192	-0.029
	(0.018)	(0.018)	(0.024)	(0.118)	(0.085) **	(0.022)
Parental notification abortion law	-0.042	-0.004	-0.004	0.066	-0.003	-0.047
	(0.025) *	(0.023)	(0.023)	(0.108)	(0.060)	(0.022) **
AIDS rate	0.000	0.000	-0.001	0.001	0.001	-0.001
	(0.001)	(0.000)	(0.001)	(0.002)	(0.002)	(0.001) *
High school	0.005	0.005	0.001	0.023	-0.008	0.000
	(0.004)	(0.004)	(0.002)	(0.008) **	(0.007)	(0.002)
Some college	0.003	0.002	-0.002	0.031	-0.015	0.001
	(0.004)	(0.005)	(0.003)	(0.016) *	(0.008) *	(0.002)
College	0.005	0.005	0.002	0.034	-0.012	0.001
	(0.004)	(0.004)	(0.002)	(0.014) **	(0.008)	(0.002)
Bible word of God	-0.000	-0.000	-0.000	-0.001	0.000	-0.001
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000) *
Church attendance	-0.000	-0.000	0.000	0.000	0.001	0.001
	(0.001)	(0.000)	(0.000)	(0.001)	(0.001) *	(0.001) **
Protestant	-0.001	-0.000	-0.000	0.001	-0.002	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Catholic	-0.001	-0.001	-0.000	-0.002	-0.003	-0.001
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001) *	(0.001)
Jewish	-0.002	-0.002	-0.001	-0.004	-0.001	0.001
	(0.002)	(0.001) **	(0.001) *	(0.003)	(0.002)	(0.001)
Other religion	-0.000	-0.001	-0.002	-0.002	-0.002	0.001
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)
Unemployment	-0.010	-0.010	-0.009	-0.009	0.001	0.001
	(0.004) **	(0.003) **	(0.003) **	(0.006)	(0.006)	(0.005)
Real income	0.000	0.000	0.000	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Black	-0.005	0.018	0.012	0.105	-0.000	0.000
	(0.016)	(0.017)	(0.019)	(0.055) *	(0.031)	(0.027)
Urban	0.004	0.005	0.003	0.021	0.021	0.019
	(0.006)	(0.007)	(0.021)	(0.012) *	(0.017)	(0.025)
Pop 15-29	0.028	0.026	0.017	0.028	0.017	-0.008
	(0.011) **	(0.009) **	(0.009) *	(0.027)	(0.017)	(0.019)
Pop 30-44	-0.001	-0.008	0.002	0.003	-0.006	0.001
	(0.013)	(0.011)	(0.013)	(0.031)	(0.023)	(0.026)
N	1419	1419	1419	1356	1356	1356
R-squared	0.870	0.924	0.943	0.752	0.925	0.968
State-Specific Trend	No	Yes	Yes	No	Yes	Yes
State-Specific Trend^2	No	No	Yes	No	No	Yes

NOTE. All dependent variables are logged. All specifications include state fixed effects, year effects, and are weighted by state population share. Numbers in parentheses are robust standard errors adjusted for clustering on states. A double asterisk indicates significance at the 5% level, and a single asterisk indicates significance at the 10% level.

Table 7
The Effects of Same-Sex Marriage Bans on Syphilis and Gonorrhea by Ban Type

	Dependent Variable: Syphilis rate								
	OLS			DYNAMIC PANEL			AB-GMM		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Regression A									
Any ban	0.311	0.406	0.277	0.076	0.175	0.130	-0.021	0.022	-0.016
	(0.137) **	(0.165) **	(0.136) **	(0.054)	(0.079) **	(0.082)	(0.109)	(0.113)	(0.110)
N	1317	1317	1317	1236	1236	1236	1166	1166	1166
Regression B									
Only statutory ban	0.323	0.408	0.275	0.076	0.174	0.128	-0.019	0.022	-0.019
	(0.137) **	(0.164) **	(0.135) **	(0.055)	(0.079) **	(0.082)	(0.110)	(0.113)	(0.110)
Both constitutional &	0.183	0.315	0.360	0.077	0.202	0.169	-0.039	0.014	0.059
statutory ban	(0.169)	(0.224)	(0.203) *	(0.062)	(0.091) **	(0.114)	(0.169)	(0.166)	(0.163)
N	1317	1317	1317	1236	1236	1236	1166	1166	1166
Regression C									
Only marriage ban	0.329	0.410	0.265	0.072	0.166	0.116	-0.044	0.004	-0.042
	(0.147) **	(0.171) **	(0.137) *	(0.058)	(0.083) *	(0.081)	(0.111)	(0.114)	(0.110)
Both marriage & civil	0.225	0.380	0.374	0.096	0.225	0.243	0.153	0.214	0.287
union ban	(0.134) *	(0.203) *	(0.208) *	(0.047) **	(0.081) **	(0.122) *	(0.141)	(0.144) *	(0.144) **
N	1317	1317	1317	1236	1236	1236	1166	1166	1166
State-Specific Trend	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
State-Specific Trend ^2	No	No	Yes	No	No	Yes	No	No	Yes

	Dependent Variable: Gonorrhea rate								
	OLS			DYNAMIC PANEL			AB-GMM		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Regression A									
Any ban	0.122	0.054	0.010	0.031	0.042	0.018	0.033	0.018	0.026
	(0.062) *	(0.073)	(0.049)	(0.028)	(0.042)	(0.038)	(0.030)	(0.039)	(0.035)
N	1372	1372	1372	1323	1323	1323	1274	1274	1274
Regression B									
Only statutory ban	0.122	0.054	0.010	0.029	0.042	0.018	0.030	0.020	0.028
	(0.063) *	(0.074)	(0.050)	(0.028)	(0.043)	(0.039)	(0.030)	(0.040)	(0.036)
Both constitutional &	0.124	0.053	0.019	0.048	0.069	0.024	0.084	0.078	0.093
statutory ban	(0.094)	(0.071)	(0.054)	(0.039)	(0.041)	(0.044)	(0.041) **	(0.057)	(0.062)
N	1372	1372	1372	1323	1323	1323	1274	1274	1274
Regression C									
Only marriage ban	0.125	0.059	0.014	0.029	0.039	0.017	0.018	0.005	0.009
	(0.063) *	(0.078)	(0.053)	(0.028)	(0.045)	(0.042)	(0.030)	(0.037)	(0.032)
Both marriage & civil	0.112	0.027	-0.017	0.039	0.060	0.027	0.114	0.129	0.137
union ban	(0.090)	(0.072)	(0.059)	(0.038)	(0.042)	(0.041)	(0.047) **	(0.069) *	(0.068) **
N	1372	1372	1372	1323	1323	1323	1274	1274	1274
State-Specific Trend	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
State-Specific Trend ^2	No	No	Yes	No	No	Yes	No	No	Yes

NOTE. All dependent variables are logged. All specifications include state-year controls. OLS and Dynamic Panel regressions include state fixed effects and year effects, are weighted by state population share, and standard errors are adjusted for clustering on states. Numbers in parentheses are robust standard errors. A double asterisk indicates significance at the 5% level, and a single asterisk indicates significance at the 10% level.

Table 8
The Effects of Same-Sex Marriage Bans on Tuberculosis by Ban Type (Falsification Tests)

	Dependent Variable: Tuberculosis rate								
	OLS			DYNAMIC PANEL			AB-GMM		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Regression A									
Any ban	0.014	-0.012	0.006	0.019	-0.003	0.006	0.069	0.080	0.051
	(0.036)	(0.024)	(0.024)	(0.021)	(0.022)	(0.025)	(0.047)	(0.118)	(0.051)
N	734	734	734	684	684	684	634	634	634
Regression B									
Only statutory ban	0.016	-0.008	0.011	0.021	0.001	0.011	0.069	0.090	0.051
	(0.036)	(0.022)	(0.023)	(0.022)	(0.020)	(0.025)	(0.047)	(0.256)	(0.052)
Both constitutional & statutory ban	-0.040	-0.069	-0.043	-0.022	-0.057	-0.044	0.078	0.205	0.043
	(0.048)	(0.035) *	(0.034)	(0.030)	(0.030) *	(0.033)	(0.058)	(0.392)	(0.063)
N	734	734	734	684	684	684	634	634	634
Regression C									
Only marriage ban	0.011	-0.013	0.006	0.017	-0.004	0.004	0.068	0.306	0.052
	(0.038)	(0.025)	(0.024)	(0.022)	(0.022)	(0.026)	(0.047)	(0.253)	(0.052)
Both marriage & civil union ban	0.045	0.001	0.014	0.040	0.003	0.019	0.078	0.704	0.037
	(0.044)	(0.042)	(0.043)	(0.024)	(0.039)	(0.045)	(0.057)	(0.452)	(0.064)
N	734	734	734	684	684	684	634	634	634
State-Specific Trend	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
State-Specific Trend ^2	No	No	Yes	No	No	Yes	No	No	Yes

NOTE. All dependent variables are logged. All specifications include state-year controls. OLS and Dynamic Panel regressions include state fixed effects and year effects, are weighted by state population share, and standard errors are adjusted for clustering on states. Numbers in parentheses are robust standard errors. A double asterisk indicates significance at the 5% level, and a single asterisk indicates significance at the 10% level.

Table 9
The Effects of Same-Sex Marriage Bans on Marriage and Divorce by Ban Type

	Marriage rate			Divorce rate		
	OLS			OLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Regression A						
Any ban	-0.007	0.007	-0.002	-0.094	-0.159	-0.067
	(0.024)	(0.019)	(0.021)	(0.068)	(0.081) *	(0.049)
N	1419	1419	1419	1356	1356	1356
Regression B						
Only statutory ban	-0.005	0.007	-0.003	-0.097	-0.160	-0.068
	(0.024)	(0.019)	(0.021)	(0.068)	(0.081) *	(0.049)
Both constitutional &	-0.029	0.014	0.031	-0.069	-0.145	-0.048
statutory ban	(0.034)	(0.038)	(0.036)	(0.078)	(0.086) *	(0.056)
N	1419	1419	1419	1356	1356	1356
Regression C						
Only marriage ban	0.004	0.015	0.000	-0.092	-0.156	-0.067
	(0.024)	(0.019)	(0.022)	(0.069)	(0.082) *	(0.050)
Both marriage & civil	-0.056	-0.039	-0.021	-0.107	-0.187	-0.065
union ban	(0.038)	(0.024)	(0.026)	(0.077)	(0.086) **	(0.049)
N	1419	1419	1419	1356	1356	1356
State-Specific Trend	No	Yes	Yes	No	Yes	Yes
State-Specific Trend ^2	No	No	Yes	No	No	Yes

NOTE. All dependent variables are logged. All specifications include state fixed effects, year effects, and state-year controls and are weighted by state population share. Numbers in parentheses are robust standard errors adjusted for clustering on states. A double asterisk indicates significance at the 5% level, and a single asterisk indicates significance at the 10% level.

Table 10
Vote in Favor of Same-Sex Marriage Bans

	Dependent Variable: Syphilis rate								
	OLS			DYNAMIC PANEL			AB-GMM		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Regression B									
Only statutory ban	0.293	0.406	0.303	0.074	0.183	0.149	-0.018	0.037	0.011
	(0.135) **	(0.162) **	(0.136) **	(0.054)	(0.079) **	(0.081) *	(0.109)	(0.112)	(0.108)
Vote in favor of	0.001	0.005	0.007	0.001	0.003	0.003	-0.001	0.001	0.002
constitutional ban	(0.002)	(0.003)	(0.003) **	(0.001)	(0.001) **	(0.002) *	(0.002)	(0.002)	(0.002)
N	1317	1317	1317	1236	1236	1236	1166	1166	1166
State-Specific Trend	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
State-Specific Trend ^2	No	No	Yes	No	No	Yes	No	No	Yes

	Dependent Variable: Gonorrhea rate								
	OLS			DYNAMIC PANEL			AB-GMM		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Regression B									
Only statutory ban	0.110	0.050	0.018	0.027	0.043	0.025	0.025	0.018	0.032
	(0.064) *	(0.077)	(0.053)	(0.028)	(0.045)	(0.042)	(0.030)	(0.040)	(0.036)
Vote in favor of	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
constitutional ban	(0.001)	(0.001)	(0.001)	(0.001)	(0.001) *	(0.001)	(0.001) *	(0.001)	(0.001) *
N	1372	1372	1372	1323	1323	1323	1274	1274	1274
State-Specific Trend	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
State-Specific Trend ^2	No	No	Yes	No	No	Yes	No	No	Yes

	Marriage rate			Divorce rate		
	OLS			OLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Regression B						
Only statutory ban	-0.007	0.004	-0.003	-0.097	-0.161	-0.066
	(0.023)	(0.019)	(0.022)	(0.067)	(0.081) *	(0.051)
Vote in favor of	-0.001	0.000	0.000	-0.001	-0.002	-0.001
constitutional ban	(0.000)	(0.001)	(0.001)	(0.001)	(0.001) *	(0.001)
N	1419	1419	1419	1356	1356	1356
State-Specific Trend	No	Yes	Yes	No	Yes	Yes
State-Specific Trend ^2	No	No	Yes	No	No	Yes

NOTE. All dependent variables are logged. All specifications include state-year controls. OLS and Dynamic Panel regressions include state fixed effects and year effects, are weighted by state population share, and standard errors are adjusted for clustering on states. Numbers in parentheses are robust standard errors. A double asterisk indicates significance at the 5% level, and a single asterisk indicates significance at the 10% level.

Table 11
Dynamic Effects of Same-Sex Marriage Bans

	Dependent Variable								
	Syphilis rate			Gonorrhea rate			Tuberculosis rate		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Regression D									
First 2 years after ban	0.203	0.245	0.151	0.055	0.032	0.006	0.028	0.004	0.014
	(0.102) *	(0.120) **	(0.107)	(0.040)	(0.055)	(0.042)	(0.033)	(0.026)	(0.030)
Years 3-4	0.480	0.521	0.319	0.130	0.088	0.021	0.016	-0.002	0.006
	(0.155) **	(0.217) **	(0.182) *	(0.067) *	(0.092)	(0.056)	(0.046)	(0.033)	(0.049)
Years 5-6	0.398	0.462	0.154	0.190	0.129	0.025	-0.007	0.007	-0.004
	(0.181) **	(0.265) *	(0.239)	(0.102) *	(0.140)	(0.091)	(0.064)	(0.050)	(0.072)
Years 7-8	0.196	0.246	-0.048	0.143	0.053	-0.038	0.016	0.016	-0.000
	(0.214)	(0.284)	(0.295)	(0.101)	(0.135)	(0.096)	(0.066)	(0.061)	(0.089)
Year 9 onwards	0.265	0.352	0.084	0.165	0.081	0.038	-0.016	0.008	-0.045
	(0.211)	(0.303)	(0.322)	(0.091) *	(0.141)	(0.115)	(0.090)	(0.077)	(0.099)
N	1317	1317	1317	1372	1372	1372	734	734	734
State-Specific Trend	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
State-Specific Trend ^2	No	No	Yes	No	No	Yes	No	No	Yes

	Marriage rate			Divorce rate		
	(1)	(2)	(3)	(4)	(5)	(6)
Regression D						
First 2 years after ban	-0.032	-0.010	-0.007	-0.158	-0.123	-0.045
	(0.022)	(0.017)	(0.021)	(0.074) **	(0.055) **	(0.034)
Years 3-4	-0.002	0.028	0.026	-0.147	-0.231	-0.115
	(0.026)	(0.023)	(0.025)	(0.098)	(0.121) *	(0.083)
Years 5-6	0.005	0.045	0.039	0.033	-0.158	-0.080
	(0.035)	(0.028)	(0.029)	(0.092)	(0.075) **	(0.055)
Years 7-8	0.008	0.052	0.040	0.048	-0.175	-0.089
	(0.032)	(0.025) **	(0.033)	(0.094)	(0.077) **	(0.056)
Year 9 onwards	0.016	0.065	0.058	-0.008	-0.233	-0.112
	(0.028)	(0.034) *	(0.034) *	(0.078)	(0.089) **	(0.071)
N	1419	1419	1419	1356	1356	1356
State-Specific Trend	No	Yes	Yes	No	Yes	Yes
State-Specific Trend ^2	No	No	Yes	No	No	Yes

NOTE. All dependent variables are logged. All specifications include state fixed effects, year effects, and state-year controls and are weighted by state population share. Numbers in parentheses are robust standard errors adjusted for clustering on states. A double asterisk indicates significance at the 5% level, and a single asterisk indicates significance at the 10% level.

Table 12
Dynamic Effects of Same-Sex Marriage Bans (Robustness Tests)

	Dependent Variable								
	Syphilis rate								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Regression D									
First 2 years after ban	1.162	0.512	-2.396	0.215	0.157	0.132	0.243	0.255	0.156
	(2.806)	(2.406)	(2.414)	(0.124) *	(0.128)	(0.126)	(0.100) **	(0.119) **	(0.106)
Years 3-4	6.990	4.862	-1.102	0.364	0.264	0.237	0.549	0.546	0.327
	(4.334)	(4.661)	(4.690)	(0.143) **	(0.178)	(0.185)	(0.157) **	(0.217) **	(0.183) *
Years 5-6	6.920	5.032	-2.820	0.262	0.159	0.079	0.478	0.490	0.162
	(5.021)	(5.170)	(5.246)	(0.163)	(0.223)	(0.259)	(0.181) **	(0.264) *	(0.241)
Years 7-8	7.487	4.630	-3.497	0.089	0.004	-0.042	0.293	0.288	-0.040
	(5.869)	(4.750)	(5.956)	(0.209)	(0.281)	(0.323)	(0.212)	(0.284)	(0.300)
Year 9 onwards	6.037	6.349	-0.530	0.181	0.124	0.132	0.375	0.413	0.094
	(6.207)	(4.925)	(9.054)	(0.203)	(0.302)	(0.361)	(0.211) *	(0.300)	(0.327)
Log Dependent Variable	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Includes California	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
Includes DC	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
State-Specific Trend	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
State-Specific Trend ^2	No	No	Yes	No	No	Yes	No	No	Yes

	Gonorrhea rate								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Regression D									
First 2 years after ban	4.196	-3.800	-19.618	0.050	-0.031	-0.007	0.055	0.034	0.006
	(37.390)	(21.071)	(19.539)	(0.047)	(0.058)	(0.049)	(0.042)	(0.056)	(0.042)
Years 3-4	45.447	16.268	-16.052	0.080	-0.047	-0.007	0.131	0.089	0.022
	(48.643)	(27.906)	(21.601)	(0.064)	(0.077)	(0.055)	(0.069) *	(0.092)	(0.057)
Years 5-6	67.359	32.862	-15.274	0.082	-0.073	-0.049	0.191	0.131	0.025
	(65.006)	(35.797)	(28.659)	(0.078)	(0.104)	(0.069)	(0.107) *	(0.141)	(0.091)
Years 7-8	66.840	13.074	-27.681	0.060	-0.116	-0.071	0.144	0.055	-0.038
	(64.561)	(38.187)	(32.146)	(0.092)	(0.131)	(0.093)	(0.105)	(0.136)	(0.097)
Year 9 onwards	57.293	31.841	15.698	0.119	-0.059	0.058	0.169	0.085	0.040
	(61.966)	(46.860)	(49.356)	(0.088)	(0.154)	(0.108)	(0.094) *	(0.142)	(0.116)
Log Dependent Variable	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Includes California	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
Includes DC	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
State-Specific Trend	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
State-Specific Trend ^2	No	No	Yes	No	No	Yes	No	No	Yes

NOTE. All specifications include state fixed effects, year effects, and state-year controls and are weighted by state population share. Numbers in parentheses are robust standard errors adjusted for clustering on states. A double asterisk indicates significance at the 5% level, and a single asterisk indicates significance at the 10% level.

Table 13
Dynamic Effects of Same-Sex Marriage Bans (Robustness Tests)

	Dependent Variable								
	Marriage rate								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Regression D									
First 2 years after ban	-0.330	-0.146	-0.085	-0.030	-0.014	-0.001	-0.037	-0.010	-0.007
	(0.186) *	(0.134)	(0.164)	(0.022)	(0.019)	(0.022)	(0.022) *	(0.017)	(0.021)
Years 3-4	-0.061	0.156	0.199	-0.020	-0.000	0.021	-0.009	0.028	0.026
	(0.229)	(0.177)	(0.186)	(0.023)	(0.019)	(0.026)	(0.025)	(0.023)	(0.025)
Years 5-6	-0.063	0.276	0.283	-0.017	0.008	0.031	-0.005	0.045	0.039
	(0.287)	(0.203)	(0.220)	(0.035)	(0.020)	(0.029)	(0.034)	(0.028)	(0.029)
Years 7-8	-0.017	0.352	0.316	-0.004	0.019	0.037	-0.003	0.052	0.039
	(0.277)	(0.181) *	(0.267)	(0.034)	(0.019)	(0.035)	(0.032)	(0.025) **	(0.033)
Year 9 onwards	-0.010	0.477	0.439	0.004	0.027	0.045	0.006	0.066	0.057
	(0.242)	(0.305)	(0.275)	(0.026)	(0.025)	(0.035)	(0.029)	(0.034) *	(0.034) *
Log Dependent Variable	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Includes California	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
Includes DC	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
State-Specific Trend	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
State-Specific Trend ^2	No	No	Yes	No	No	Yes	No	No	Yes
	Divorce rate								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Regression D									
First 2 years after ban	-0.245	-0.042	0.013	-0.016	-0.026	-0.001	-0.138	-0.124	-0.045
	(0.166)	(0.095)	(0.095)	(0.025)	(0.018)	(0.016)	(0.060) **	(0.055) **	(0.034)
Years 3-4	-0.185	-0.065	0.047	-0.048	-0.065	-0.015	-0.124	-0.234	-0.114
	(0.211)	(0.110)	(0.140)	(0.038)	(0.038) *	(0.028)	(0.087)	(0.122) *	(0.083)
Years 5-6	-0.021	0.011	0.136	-0.065	-0.086	-0.026	0.061	-0.162	-0.079
	(0.248)	(0.156)	(0.182)	(0.050)	(0.048) *	(0.030)	(0.100)	(0.076) **	(0.055)
Years 7-8	0.092	-0.070	0.056	-0.047	-0.102	-0.044	0.084	-0.181	-0.089
	(0.314)	(0.193)	(0.194)	(0.040)	(0.041) **	(0.035)	(0.106)	(0.078) **	(0.056)
Year 9 onwards	-0.102	-0.190	-0.050	-0.062	-0.121	-0.045	0.032	-0.240	-0.112
	(0.324)	(0.208)	(0.232)	(0.032) *	(0.037) **	(0.038)	(0.087)	(0.092) **	(0.071)
Log Dependent Variable	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Includes California	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
Includes DC	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
State-Specific Trend	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
State-Specific Trend ^2	No	No	Yes	No	No	Yes	No	No	Yes

NOTE. All specifications include state fixed effects, year effects, and state-year controls and are weighted by state population share. Numbers in parentheses are robust standard errors adjusted for clustering on states. A double asterisk indicates significance at the 5% level, and a single asterisk indicates significance at the 10% level.