Measuring the Effects of Obergefell v. Hodges: Revisiting Same-Sex Marriage Legalization and Mortgage Demand*

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Abstract

Abstract: The U.S. Supreme Court's 2015 ruling in Obergefell v. Hodges made same-sex marriage legal in all states. We estimate the effect of this landmark ruling on the mortgage demand of same-sex couples. Using data on the near universe of mortgage applications, we employ a difference-in-differences estimation strategy that compares the mortgage demand of same-sex and different-sex couples, before and after the ruling. We find that the ruling increased the mortgage demand of same-sex couples relative to different-sex couples by 12% in states where same-sex marriage was previously unavailable. Interestingly, we also estimate a 15% increase in the mortgage demand of same-sex couples in states that had already legalized same-sex marriage prior to the ruling. This suggests that the federal Supreme Court ruling brought greater certainty to same-sex couples, even in states where same-sex marriage was already legal. Our results emphasize the importance of federal Supreme Court rulings over and above similar state-level legislation in shaping outcomes of vulnerable populations.

JEL codes: J12, R21, R28

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1 Introduction

The Unites State Supreme Court's 2015 decision in Obergefell v. Hodges was a landmark ruling in favor of marriage equality, legalizing same-sex marriage across all fifty states. It affirmed the constitutional right of same-sex couples to marry and to enjoy the same marital benefits as opposite-sex couples, including spousal health insurance, survivor benefits, hospital visitation rights, spousal testimony privileges, and divorce protection. Some of these benefits may incentivize homeownership among same-sex couples. For example, access to survivor benefits provides clarity on property transfer after death, simplifying tax preparation, and creating a formal contract that specifies how assets will be distributed in the event of divorce (Miller and Park, 2018). There is also evidence that same-sex marriage legalization may have affected the formation and take-up of monogamous relationships.[1] An increase in the number of same-sex couples in committed relationships increases the pool of potential same-sex home buyers increasing the demand for mortgage credit.

While the ruling had a direct impact on the LGBTQ+ population in states where same-sex marriage had not been previously legalized, it also had significant implications for the LGBTQ+ community in states where same-sex marriage was already legal. First, it provided legal certainty to same-sex couples that their right to marriage would not be repealed.[2] Second, legally married same-sex couples gained access to federal marital benefits following the repeal of the Defence of Marriage Act (DOMA) in 2013. These include federal joint tax filling, eligibility for spousal social security benefits, and the ability to sponsor a spouse for immigration. The Obergefell v. Hodges ruling provided additional clarity on the federal benefits available to them.[3]

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[1]There are several studies which find that access to legal same-sex marriage reduces rates of sexually transmitted infections (Nikolaou 2023a; Nikolaou 2023b; Dee 2008).

[2]After becoming one of the first states to issue marriage licenses to same-sex couples, in November 2008, California voted to add a state constitutional amendment banning same-sex marriage.

[3]Due to the short period of time between the repeal of DOMA in 2013 and the Obergefell v. Hodges ruling in 2015, we are unable to rule out that the effects documented in this study are

Third, it lead to shifts in public perceptions of the LGBTQ+ community, enhancing their well-being and potentially impacting partner formation decisions (Flores et al., 2020; Kazyak and Stange, 2018).

Home ownership is widely considered as an integral part of the 'American Dream' because homeownership offers financial gains and the opportunity to build wealth (Goodman and Mayer, 2018). Prior research underscores the significance of homeownership as a pivotal instrument for accumulating wealth and consumption smoothing (Sodini et al., 2016). Many have argued in favour of supporting homeownership as a means to combat racial inequality.[4]

Previous work exploits the rollout of same-sex marriage across U.S. states and finds that early marriage legalization increases the number of applications for mortgages from same-sex couples relative to different sex couples (Miller and Park, 2018). However, it remains unclear if states that legalized same-sex marriage as a result of the Obergefell v. Hodges ruling would experience similar effects. States which legalized same-sex marriage prior to the 2015 ruling are systematically different from states which legalized same-sex marriage as a result of the ruling. Early legalization states tend to have a larger number of same-sex couples and may have different underlying demand for same-sex marriage and mortgage credit among same-sex couples.[5] We utilize Home Mortgage Disclosure Act (HMDA) data in order to conduct this study. Although HMDA data does not allow us to directly observe the sexual orientation of mortgage applicants, we follow prior research and assume that applications where the

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contaminated by the 2013 repeal of DOMA. We argue that the repeal of DOMA is inextricably linked to the 2015 Supreme Court ruling. We emphasize the role of the 2015 ruling because of its relative salience. Regardless of which ruling is driving our results, our findings underscore the importance of Supreme Court rulings in shaping the lives of vulnerable populations.

[4]In 2003, President George W. Bush signed the American Dream Downpayment Act to assist first time homeowners in obtaining a downpayment framing homeownership as a way to combat racial inequality Goodman and Mayer (2018).

[5]Table 2 depicts demographic characteristics of states by legalization year and shows that early legalization states have a significantly larger number of same-sex couples as well as a larger number of applications from same-sex couples.

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applicant and co-applicant belong to the same-sex, represent same-sex couples (Miller and Park, 2018; Hagendorff et al., 2022; Sun and Gao, 2019). Although this method is an imperfect proxy for capturing the demand for mortgages among same-sex couples, we argue that this method credibly allows us to identify applications from same-sex couples.[6] Since we observe the near universe of home mortgage applications, we consider the number of applications from same-sex and different-sex couples as the best available measure of their mortgage demand.

Given recent advancements in the difference-in-differences literature, we first reestimate the effects of same-sex marriage legalization on mortgage demand for same-sex couples in early legalization states using an updated estimator that is robust to staggered treatment timing and treatment effect heterogeneity (Borusyak et al., 2021). We use a triple difference estimation strategy where we compare the number of mortgage applications from same-sex and different sex couples across spacial and temporal variations in same-sex marriage legalization. We verify that our estimates are similar to Miller and Park (2018). Thereafter, we estimate the effects of the 2015 Obergefell v. Hodges ruling on mortgage demand. Although seventeen states experienced a change in legalization status as a result of the ruling, this has not yet been explored in the literature. In the absence of untreated states, estimating the effects of the ruling requires additional care.[7] In order to estimate the effects of same-sex marriage legalization in Obergefell states (states that legalized same-sex marriage in 2015 due to the ruling), previous literature often treats early legalization states as a control group (Nikolaou, 2023a). Although researchers acknowledge the limitations of this approach because it ignores the dynamic effects of treatment over time, it may be

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[6]This method is imperfect because we do not observe cash purchases of homes as well as loans from smaller lenders. We also undoubtedly misidentify some individuals as same-sex couples who may be applying for loans together for other reasons. We are also unable to identify all couples who are purchasing homes because some may not apply for loans jointly and we are unable to discern their relationship status or sexual orientation.

[7]After 2015, all states had legalized same-sex marriage.

particularly problematic when estimating the effects of same-sex marriage legalization because the 2015 federal ruling may have effects on same-sex couples living in early legalization states who are serving as the control group. If the effects of the ruling on states which did not offer same-sex marriage and states that had previously legalized same-sex marriage are in the same-direction, this method would yield an estimate that is biased downwards. We avoid this problem by estimating effects on early legalization states and Obergefell states separately. We conduct a difference-in-differences analysis where we compare rates of home mortgage applications for same-sex and different-sex couples before and after the ruling in Obergefell states as well as early legalization states. We find that the Obergefell v. Hodges ruling increased mortgage applications from same-sex couples relative to different sex couples by approximately 12 percent in Obergefell states and 15 percent in early legalization states. In line with literature documenting a greater same-sex marriage take-up amongst women compared to men, we find larger effects for same-sex female couples compared to same-sex male couples (Carpenter and Gates, 2008; Badgett and Mallory, 2014a; Ramos et al., 2009). We then conduct analysis at the county level and find that the estimated effects are driven almost entirely by changes in metropolitan counties.

We contribute to a growing literature exploring the effects of same-sex marriage legalization on outcomes for same-sex couples. Previous research has explored the effects of same-sex marriage legalization on adoption decisions, discrimination, family formation, health insurance, income tax collections, labor force participation, marriage take-up, mental health, migration, partnership stability, public opinions on LGBTQ+ populations, and sexually transmitted infections (Martin and Rodriguez, 2022; Sansone, 2019; Trandafir, 2015; Carpenter et al., 2021; Carpenter et al., 2023; (Alm et al., 2014; Friedberg and Isaac, 2022; Dillender, 2015; Hansen et al., 2020; Isaac, 2023; Carpenter, 2020; Mark Anderson et al., 2021; Chen and Van Ours, 2022; Beaudin, 2017; Chen and van Ours, 2020; Blasco et al., 2022; Francis et al., 2012).

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Much of this research is based on the staggered roll-out of same-sex marriage across U.S. states and to the best of our knowledge, this is the first paper to consider the effects of the Obergefell v. Hodges ruling on same-sex couples living in states which had already legalized same-sex marriage. By solely focusing on state-level policy changes, we miss meaningful dimensions of national policies shaping the welfare of sexual minorities.

Understanding the effects of this specific Supreme Court ruling is particularly relevant given increased fears that the ruling may be overturned due to the recent overturn of Roe v. Wade and a statement by Supreme Court justice Clarance Thomas arguing that the Supreme Court should "reconsider" its past rulings codifying rights to contraception access, same-sex relationships and same-sex marriage (Politico-Legal, 2022). The findings of this study are relevant more broadly in understanding the impact of Supreme Court rulings compared to state-specific policies and laws in shaping outcomes for vulnerable populations.

2   Background

Although there had been attempts at legalizing same-sex marriage since the 1970s, no major developments in favor of same-sex marriage legalization occurred until 1993 when the Supreme Court of Hawaii ruled that the state's prohibition on same-sex marriage was unconstitutional. However, the ruling was met with immediate opposition at the federal level, with President Bill Clinton signing the Defense of Marriage Act (DOMA) into law in 1996. DOMA defined marriage as a union exclusively between one man and one woman at the federal level.

Thereafter, several states attempted to provide same-sex couples with legal recognition. In 1999, California became the first state to recognize same-sex couples with its statewide domestic partner registry. Several states followed suit, offering similar

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domestic partnership or civil union options to same-sex couples, as the movement for legal recognition of same-sex relationships gained momentum across the United States. In 2004, Massachusetts became the first state to legalize same-sex marriage. It was followed by Connecticut in 2008 and Vermont in 2009. California legalized same-sex marriage in 2008 and then repealed it later in the same year. Thereafter, states continued to legalize same-sex marriage through either judicial decisions, legislative actions, or referendums. Table 1 lists the year when same-sex marriage was legalized in each state as well as the method of legalization. We categorize states into Earliest Legalization States, Expanded Early Legalization States and Obergefell States. The Earliest Legalization States are states that legalized same-sex marriage prior to 2012.[8] Expanded Early Legalization States are states that legalized same-sex marriage after 2011 but before the Obergefell v. Hodges ruling and the Obergefell States represent all states which legalized same-sex marriage in 2015 as a result of the Obergefell v. Hodges Supreme Court ruling. Throughout this paper, we use these categories in order to estimate the effects of same-sex marriage legalization and the Obergefell v. Hodges ruling.

Despite many states recognizing same-sex marriages, even legally married couples did not receive the same federal rights and benefits as different-sex couples due to the Defense of Marriage Act (DOMA). Married same-sex couples could not avail federal tax, social security or immigration benefits enjoyed by married different-sex couples. This was until 2013 when the U.S. Supreme Court struck down DOMA in the United States v. Windsor case. This meant that legally married same-sex couples could access the same benefits enjoyed by married different-sex couples. This landmark ruling laid the groundwork for the Supreme Courts 2015 ruling in Obergefell

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[8]The preferred estimation strategy employed by this paper is an event-study design. When estimating the effects of the Obergefell v. Hodges ruling we do not consider states that legalized same-sex marriage between 2012 and the 2015 ruling because our pre-treatment years are contaminated with a change in legalization status.

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v. Hodges which granted same-sex couples the right to marry across the entire United States. The Obergefell v. Hodges ruling received nationwide coverage with millions of twitter users using the Human Rights Campaign's hashtag "#LoveWins" nationwide (Awards, 2016).

3   Data

Estimating the effects of policies on sexual minorities is difficult due to the data landscape as most surveys do not report sexual orientation which makes it difficult to correctly identify sexual minorities (Badgett et al., 2021). As a result, researchers have come up with innovative ways of identifying sexual minorities.[9] Moreover, even when researchers are able to identify sexual minorities, surveys often contain only a small sample of this population. In this paper, we employ the Home Mortgage Disclosure Act (HMDA) data, which allows us to overcome the challenge of limited sample size. (Consumer Financial Protection Bureau, 2023). HMDA data is collected as a result of the 1975 act that requires many financial institutions to report loan-level information on mortgages. It is the most comprehensive available dataset on mortgage market activities. The U.S. Department of Housing and Urban Development (HUD) estimates that between 75 and 85 percent of conventional originations are reported in HMDA data (2011).[10]

The data is available at the application level and is aggregated to the state level for estimation. We examine mortgage applications for the years 1998 to 2019 in our analysis.[11] We limit our analysis to owner-occupied home purchase applications that

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[9]For example, Carpenter et al. (2021) exploits the sex composition of households to identify respondents who are more likely to be same-sex couples.

[10]We do not observe cash purchases of homes as well as loans from smaller lenders.

[11]We do not use more recent years to avoid capturing the effects of the Covid-19 pandemic.

have an applicant and a co-applicant.[12,13] For each application, the data contains a rich set of information on applicant and co-applicant demographics, loan characteristics, lender characteristics, and application outcomes. Specifically, it details the applicant and co-applicant sex. Using this information and following previous research, we categorize an application as a same-sex couple application if the applicant and co-applicant are of the same sex, and as a different-sex couple application if the applicant and co-applicant are of a different sex (Miller and Park 2018; Hagendorff et al. 2022; Sun and Gao, 2019). This method is imperfect as it potentially miscategorizes some applications as same-sex couple applications even though the applicant and co-applicant are not a couple. For example, a father may be the co-applicant on his son's application. It also does not identify all same-sex couple applications as some same-sex couples do not apply jointly. However, since these should not significantly change with the treatment timing (i.e. the timing of early same-sex marriage legalization or the Obergefell v. Hodges ruling), we do not expect these to affect our analysis.[14]

To further verify that our categorization of same-sex couples is reasonably indicative of actual same-sex couples, we plot the state-level share of same-sex couple applications in the HDMA data and the share of same-sex homeowners in the American Community Survey (ACS) in Figure 1 [15,16] We find that these variables are highly

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[12]We exclude home-improvement and refinancing applications and applications for non owner-occupied home purchases that typically represent property investments and are less relevant for our analysis (Robinson, 2012)

[13]This represents approximately 32% of all home purchase applications in the HMDA.

[14]To ensure that the estimated effects are not driven by non-couple family members applying together, in subsection 5.1, we restrict the sample to include only different race couples and find that our estimates are consistent.

[15]Although the ACS provides data on home ownership and same-sex couple status, we believe the HMDA data is a superior source for studying effects on home-ownership. In addition to containing a smaller sample of same-sex couples, ACS data is only able to identify home ownership in a particular period of time as a stock variable while the HMDA data allows us to study mortgage applications or changes in homeownership as a flow variable. Previous research identifies the benefits of studying effects on flow variables rather than stock variables (Abramowitz et al., 2017).

[16]We use data from the years 2008-2019 for this comparison because several researchers have documented problems with using ACS data in order to identify same-sex couples in earlier years

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correlated ($r = 0.6$).

In Table 2, we provide summary statistics for states by the year in which same-sex marriage was legalized for the years 1998 to 2019. On average, states that legalized same-sex marriage early have a larger share of same-sex couples.[17] These states also have a larger share of mortgage applications from same-sex couples, as calculated from HDMA. There are also important differences in application characteristics between same-sex male, same-sex female and different-sex applications. These differences are presented in Table 3. Same-sex applicants have higher rates of denial, are more likely to be applying for an FHA loan, and apply for smaller loan amounts. Same-sex male applicants have higher annual incomes compared to different-sex applicants, whereas same-sex female applicants have lower incomes compared to different-sex couples. In addition to these variables, for the years 2018 and 2019, the HMDA data also includes information on interest rates, the property value of the home being purchased, the applicants' debt-to-income ratio and the applicants' age. We provide summary statistics for these variables in the second panel of Table 3. In general, same-sex couples pay higher interest rates and apply for cheaper properties. These statistics are in line with other studies identifying disparities between same-sex and different-sex couples in the home-mortgage market (Sun and Gao, 2019).

We also explore trends in mortgage demand among same and different sex couples. Figure 2 depicts the total number of mortgage applications from same-sex and different-sex couples per 100,000 population over time. In general, we find that applications from same-sex couples follow a similar trend to applications from different-sex couples.[18]

(Gates and Steinberger, 2009; Badgett et al., 2021).

[17]We calculate the share of same-sex couples from the American Community Survey (ACS) and the Behavioral Risk Factor Surveillance System (BRFSS). Since BRFSS does not directly report the relationship status of household members, we follow Carpenter et al. (2021) and exploit the sex composition of households to identify respondents who are more likely to be same-sex couples.

[18]The large dip in applications in late 2000s is a result of the great recession.

4   Methodology & Results

4.1   Early Legalization

We start by estimating the effects of same-sex marriage legalization on the mortgage demand of same-sex couples in early legalization states using an updated estimator that is robust to staggered treatment timing and treatment effect heterogeneity (Borusyak et al., 2021). For this part of the analysis, we consider all states and focus on the period from 1998 to 2014.[19] Our identification strategy compares the mortgage applications of same-sex and different-sex couples, living in states that legalized and states that did not legalize same-sex marriage, before and after legalization.

Formally, we estimate the following difference-in-differences equation:

$$\text{Log(Applications)}_{ost} = \alpha + \sum_{\substack{m \neq -1 \\ m=-5}}^{5} \beta_m \left(\text{SSM}_{sm} \times \text{App Type}_o \right) + \text{Domestic Partnership}_{ost}$$

$$+ \gamma_{st} + \delta_{ot} + \nu_{os} + \epsilon_{ost}$$

$$(1)$$

where $\text{Log(Applications)}_{ost}$ is the log number of applications of orientation ($o \in$ same-sex, different-sex), in state (s), in year (t). App Type$_o$ is an indicator that equals 1 if an observation represents same-sex couples and 0 if an observation represents different-sex couples. We include (Domestic Partnership$_{ost}$) to control for the recognition of any sort of domestic partnerships or civil unions for same-sex couples.[20] State×time fixed effects (γ_{st}) control for state time-varying factors that similarly affect the mortgage demand of same-sex and different-sex couples, such as local economic

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[19]We do not include post-2015-years because there is no control group since all states legalized same-sex marriage following the ruling.

[20]We assume that these laws only affect same-sex couples and therefore, this variable is always zero for different-sex couples.

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shocks, or real estate market trends.[21] Orientation×time fixed effects (δ_{ot}) control for nationwide time-varying factors that differently affect the mortgage demand of same-sex and different-sex couples. State×orientation fixed effects (ν_{os}) control for state time-fixed factors that differently affect the mortgage demand of same-sex and different-sex couples.

The treatment variable SSM_{sm} is an indicator for the passage of same-sex marriage legalization in state s in period m, where m ranges from five years before to five years after legalization. The coefficients of interest β_m measure the changes in $100 \times \beta_m\%$ applications of same-sex couples as a result of same-sex marriage legalization. These are identified as the differences in log applications between same-sex and different-sex couples in period m in comparison to the baseline year in states that legalized same-sex marriage, and relative to the these differences in states that did not legalize same-sex marriage. Estimates are weighted by state populations and standard errors are clustered at the state level.

The identifying assumption is that absent of same-sex marriage legalization, the differences between same-sex and different-sex mortgage applications would have evolved in parallel in states that had legalized same-sex marriage and states that had not. Although untestable, our event studies provide evidence that prior to same-sex marriage legalization, differences between same-sex and different-sex mortgage applications have generally evolved similarly in states that would later legalize same-sex marriage and those that would not.

Given recent developments in the difference-in-differences literature which identify significant flaws with linear regressions and fixed effects specifications with staggered treatment timing and treatment effect heterogeneity, in our preferred specification, we use the Imputation Estimator developed by Borusyak et al. (2021). This estimator

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[21]We do not include any state-level controls as they would be absorbed by the state×time fixed effects.

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is robust to heterogeneity in treatment timing and effects.[22]

Estimates for Equation 1 are provided in Figure 3. We provide estimates using the imputation estimator produced by Borusyak et al. (2021) as well as a traditional two-way fixed effects model. We find no evidence of pre-trends, as the coefficients for the periods prior to same-sex marriage legalization are statistically insignificant. For the periods after same-sex marriage legalization, the coefficients become positive and statistically significant, indicating an increase in mortgage demand among same-sex couples relative to different-sex couples in states that legalized same-sex marriage relative to states that did not. We find immediate effects which grow overtime.

To summarize the event study estimates into a single estimate, we also estimate the following equation which groups the pre and post periods:

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\begin{aligned}
\text{Log(Applications)}_{ost} = \alpha + \beta(\text{SSM}_{st} \times \text{App Type}_o) + \text{Domestic Partnership}_{ost} \\
+ \gamma_{st} + \delta_{ot} + \nu_{os} + \epsilon_{ost}
\end{aligned}
\tag{2}
$$

Now, SSM_{st} is an indicator that equals 1 when state s offers legal same-sex marriage in year t. All other features are similar to Equation 1. Estimates from Equation 2 are provided in Table 4. Consistent with Miller and Park (2018), we find that early same-sex marriage legalization increased the mortgage demand of same-sex couples by approximately 12%.[23]

4.2 Effects of Obergefell v. Hodges

Estimating the effects of the Obergefell v. Hodges ruling requires particular care as there are no untreated states after the ruling. To circumvent this issue, researchers

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[22]We use the Imputation Estimator over other similarly credible estimators such as the one produced by Callaway and Sant'Anna (2021) because it allows for a triple difference specification and can easily incorporate time-varying control variables and population weights.

[23]Miller and Park (2018) estimate that early legalization increases mortgage applications by 6-16%.

estimating the effects of the ruling on various outcomes used states that had legalized same-sex marriage prior to the ruling as controls for states that legalized same-sex marriage after the ruling (e.g. Massachusetts as a control for Georgia) (Nikolaou, 2023a). This method could yield particularly misleading results in this context. In addition to ignoring the dynamic treatment effects experienced by a states following same-sex marriage legalization, it also ignores the possibility that the Obergefell v. Hodges ruling may have effected same-sex couples in already treated-states (e.g. Massachusetts). If the effects of Obergefell v. Hodges on states which did not offer same-sex marriage and states that had previously legalized same-sex marriage are in the same-direction, this method would yield an estimate that is biased downwards. In order for the resulting coefficient to be statistically significant, the effect in states newly affected by the ruling must be significantly greater than that in already-treated states. This may be particularly unlikely in the case of same-sex marriage legalization because, as suggested by Table 2, there is a larger population of same-sex couples living in early legalization states.[24]

In this paper we take a different approach. Instead of comparing newly affected states with already-treated states, before and after same-sex marriage legalization, our identification strategy compares the mortgage application of same-sex and different-sex couples, before and after the ruling.

Formally, we estimate the following difference-in-difference equation:

$$
\text{Log(Applications)}_{ost} = \alpha + \sum_{\substack{m \neq 2014 \\ m=2011}}^{2019} \beta_m \left(\text{Obergefell}[t=m] \times \text{App Type}_o\right)
$$
$$
+ \text{Domestic Partnership}_{ost} + \mathbf{X}_{st} + \gamma_s + \delta_t + \nu_o
$$
(3)

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[24]In Appendix A.1. we explore how accounting for an effect of the Obergefell ruling on early legalization states might affect some of the conclusions derived from previous studies by reexploring the effect of same-sex marriage legalization on rates of sexually transmitted infections.

where Log(Applications)$_{ost}$ is the log number of applications of orientation ($o \in$ same-sex, different-sex), in state (s), in year (t). App Type$_o$ and Domestic Partnership$_{ost}$ are as defined in Equation 1. We include a series of time-varying state level controls ($\mathbf{X}_{st}$) - unemployment rate, median household income, proportion of the population that is white, under 25 and 25-44. State fixed effects (γ_s) control for time-fixed differences between states that affect mortgage demand. Time fixed effects (δ_t) control for time varying factors that effect mortgage demand. Orientation fixed effects (ν_o) control for differences between same-sex and different-sex couples that affect mortgage demand.[25]

The treatment variable (Obergefell[$t = m$]) is an indicator that equals 1 if an observation is m years relative to 2015. The coefficients of interest β_m measure the change in $100 \times \beta_m\%$ applications of same-sex couples as a result of same-Obergefell v. Hodges ruling. These are identified as the differences in log applications between same-sex and different-sex couples in period m in comparison to the baseline year 2014. Estimates are weighted by state populations and standard errors are clustered at the state level.

The identifying assumption is that absent of same-sex marriage legalization, the differences between same-sex and different-sex mortgage applications would have evolved in parallel. We estimate the effect of the ruling separately for states that legalized same-sex marriage because of the ruling (Obergefell states) and states that had already legalized same-sex marriage prior to the ruling.[26] States' categories are detailed in Table 1. In order to ensure that the pre-years are not contaminated by a change in legalization status, we only estimate the effect of the ruling on the Earliest Legalization States and do not consider effects on Expanded Early Legalization

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[25]Since this is a difference-in-differences specification instead of a triple differences specification, we do not include interactions of these fixed effects as they would absorb the identifying variation.

[26]Obergefell states include Alabama, Arkansas, Florida, Georgia, Kansas, Kentucky, Louisiana, Michigan, Mississippi, Missouri, North Dakota, Nebraska, Ohio, South Dakota, Tennessee, and Texas.

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states.[27]

Estimates for Equation 3 are provided in Figure 4. We provide estimates using the imputation estimator produced by Borusyak et al. (2021) as well as a traditional two-way fixed effects model. As the figure shows, both Obergefell and the Earliest Legalization States experienced significant increases in the mortgage demand of same-sex couples relative to different-sex couples following the ruling. We find no evidence that these positive effects are a result of pre-trends. In Earliest Legalization States, the coefficients for the periods prior to the ruling are statistically insignificant. In Obergafell states, mortgage demand of same-sex couples relative to different-sex couples was trending downward, prior to the ruling and the ruling reversed that trend, which suggests that our estimates are biased downwards.[28,29]

To summarize the event study estimates into a single estimate, we also estimate the following equation, which combines both pre and post periods:

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[27]Earliest Legalization states include Massachusetts, Connecticut, Iowa, Vermont, District of Columbia, New Hampshire and New York. Although California was one of the first states to legalize same-sex marriage in June of 2008, this ruling was overturned later that year. Therefore, we do not do not treat California as an early legalization state.

[28]This pre-Obergefell downwards trend can be explained by findings from the literature. Marcén and Morales (2022) finds that same-sex marriage legalization resulted in sexual minorities migrating to states which recently legalized same-sex marriage. Although we cannot observe migration patterns in the HMDA data, seeing a greater number of same-sex couples moving from Obergefell states to early legalization states prior to the 2015 ruling, may explain the downwards trend in the pre-treatment years in the first panel Figure 4. This also does not require that we observe opposite trends for earliest legalization states. Same-sex couples who might have purchased homes in Obergefell states might be moving and purchasing homes in expanded early legalization states rather than the earliest legalization states. They also might be moving and forgoing or delaying purchasing a home.

[29]In Figure A1, we provide estimates for the detrended version of Equation 3. Here, we follow Goodman-Bacon (2021) and detrend the outcome variable. This involves changing the outcome variable to represent the residual of a state specific predicted time trend variable. This is calculated by using only pre-years to estimate a coefficient which measures linear time trends in the outcome variable for each state and then using these coefficients to estimate a linear time trend for each state-year combination. We find that this methodology eliminates pre-existing trends and also makes our coefficients measuring the effects Obergefell on Obergefell States and Earliest Legalization States significantly larger.

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$$\text{Log(Applications)}_{ost} = \alpha + \beta \text{ (Obergefell}_t \times \text{App Type}_o) + \text{Domestic Partnership}_{ost}$$
$$+\mathbf{X}_{st} + \gamma_s + \delta_t + \nu_o$$
$$(4)$$

Now, Obergefell$_t$ is an indicator that equals 1 for the years 2015 (Obergefell v. Hodges ruling year) onwards. All other features are similar to Equation 3. Estimates from Equation 4 are provided in Table 5. The first panel details the results for Obergefell States and the second panel details the results for Earliest Legalization States. Given the smaller number of clusters in some of our specifications, in addition to reporting standard p-values, we also report wild bootstrapped p-values with 999 repetitions in Table 4 and Table 5 (Cameron et al., 2008).[30] The imputation estimator does not allow for wild bootstrap clustering so we only report standard p-values for those coefficients. Our estimates remain statistically significant even when we use wild bootstrap clustered standard errors.[31] The estimates suggest that Obergefell v. Hodges increased same-sex mortgage demand in Obergefell States by 12% and increased same-sex mortgage demand in Early Legalization States by 15%.[32]

One confounder which may be driving the observed effects of the Obergefell v. Hodges ruling on mortgage demand is the 2013 repeal of the Defence of Marriage Act (DOMA). The repeal of DOMA granted married same-sex couples access to the same federal benefits enjoyed by difference-sex couples. Since the repeal affected the

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[30]In order to achieve 999 repetitions we follow advice from Roodman et al. (2019) and use Webb weights when dealing with particularly small numbers of clusters.

[31]In Figure A2, we present estimates for our event study specification using wild bootstrap clusters.

[32]Given that our estimation strategy involves comparing mortgage applications with co-applicants of the same sex to those of different sexes, there might be concerns that the observed effects are due to changes in the composition of the group of people applying for mortgages with co-applicants. In order to rule out this possibility, we explore the effect of same-sex marriage legalization and the Obergefell v. Hodges ruling on mortgage applications among applicants with co-applicants relative to single filers in Figure A4. We find no evidence that same-sex marriage or the Obergefell v. Hodges ruling affected the proportion of overall applications from couples.

rights of married same-sex couples, we expect that the 2013 repeal disproportionately affected states which had already legalized same-sex marriage.[33] Although we do not see a discontinuity in the demand for mortgage credit around 2013 in Figure 4, it is possible that the post 2015 coefficients represent a delayed response to the repeal of DOMA.[34] Due to the short period of time between the repeal of DOMA and the Obergefell v. Hodges decision, we are unable to disentangle which factor is driving our results.

Nonetheless, we argue that the repeal of DOMA is inextricably linked to the 2015 Supreme Court ruling. Although a pivotal step towards national recognition of same-sex marriage, the 2013 repeal received significantly less coverage compared to the 2015 Obergefell v. Hodges decision.[35] There was also significant confusion about which rights married same-sex couples were eligible for following the repeal. The Obergefell v. Hodges ruling received significant media attention and provided much-needed clarity and uniformity. It is possible that the observed effects of the Obergefell v. Hodges ruling on early legalization states may represent woodwork effects.[36] Whether these developments are attributed to the repeal of DOMA or the Obergefell v. Hodges ruling, our study adds complexity to our understanding of the effects of same-sex marriage legalization. By focusing only on state-level legislation and overlooking the

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[33]We are still unable to rule out the effects of the repeal of DOMA on Obergefell states because many same-sex couples would travel to early legalization states in order to get married.

[34]Badgett and Mallory (2014b) show that there is a spike in the number of same-sex marriages in some of the states which had previously legalized same-sex marriage right after the repeal of DOMA.

[35]In Figure A3, we present trends in search intensities for certain relevant terms in order to show the salience of the Obergefell v. Hodges ruling compared to the United States v. Windsor Decision. The first panel presents trends in search intensities for the terms "United States v. Windsor" and "Obergefell v. Hodges". The figure shows a significantly greater number of searches for "Obergefell v. Hodges" compared to "United States v. Windsor". In the second panel, we present trends in search intensities for the term "Same Sex Marriage". Although we see a spike in search intensities for this term around the United States v. Windsor Decision, this spike is significantly smaller than the spike in searches around the Obergefell v. Hodges ruling. Taken together, this figure depicts the relative salience of the Obergefell v. Hodges decision compared to the United States v. Windsor decision.

[36]Woodwork effect refers to the phenomenon where an increase in the availability of a public benefit or service leads to a greater number of eligible individuals coming "out of the woodwork" to access the service.

impact of substantial national changes, we risk missing key aspects of the policy shifts affecting sexual minorities.

In order to verify the credibility of these findings, we present estimates for several alternative specifications in Table A1. In the first two panels, we show that our estimates are robust to dropping control variables. In the next two panels, we show that estimates are robust to dropping population weights.[37] In the last 2 columns, we detrend our outcome variable and reestimate Equation 2 & Equation 4.[38] We find that estimates measuring the effects of Early Legalization remain largely unchanged but as suggested from the pre-trends in Figure 4, estimates for the effect of Obergefell are significantly larger after detrending the outcome variable.

Taken together, we find that Obergefell v. Hodges not only increased mortgage demand by same-sex couples that gained access to same-sex marriage via the Supreme Court ruling, but also increased mortgage demand for same-sex couples in states which had already legalized same-sex marriage. This underscores the importance of federal Supreme Court ruling over more localized state policies. A ruling by the Supreme Court provides greater legal certainty and consistency.

5 Robustness

5.1 Only Applications from Bi-Racial Couples

Given our inability to directly ascertain the sexual orientation of applicants, we operate under the assumption that applicants of the same sex who apply together are more likely to be same-sex couples. However, not all joint applicants from same-sex

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[37]Solon et al. (2015) explains that differences in population-weighted and unweighted estimates may be a result of unmodeled heterogeneity. They suggest reporting both weighted and unweighted estimate.

[38]We accomplish this by changing the outcome variable to represent the residual of a state specific predicted time trend variable. This is calculated by using only pre-years to estimate a coefficient which measures linear time trends in the outcome variable for each state and then using these coefficients to estimate a linear time trend for each state-year combination.

individuals represent same-sex couples. Non-couple family members may choose to buy property together. In order to ensure that the effects documented in this paper are not driven by changes in the number of family applications over time and space, we reestimate Equation 2 and Equation 4 while restricting the sample to applications in which the applicant and co-applicant are of different races. These applicants are significantly less likely to be non-couple family members. In the first two columns of Table 6, we show that the overall effects persist in this subsample.

5.2 Only Accepted Mortgage Applications

Recent literature suggests that same-sex marriage legalization increases denial rates among same-sex couples applying for mortgages (Hagendorff et al., 2022). Since we are unable to identify unique applicants in the dataset, it is possible that the observed increase in mortgage demand after same-sex marriage legalization is driven by the same same-sex couples having to apply more times after same-sex marriage legalization due to higher rates of denial. In order to account for this possibility, we reestimate Equation 2 and Equation 4 while restricting the sample to applications that have been accepted, as accepted applicants are unlikely to apply again. Further verifying the robustness of our findings, we document similar estimates when restricting our sample to accepted applications in Table 6.

6 Heterogeneous Effects on Gay and Lesbian Couples

Next, we explore effects on same-sex male and same-sex female couples separately. Sex specific estimates for Equation 1 and Equation 3 are provided in Figure 5. Sex specific estimates for Equation 2 and Equation 4 are provided in Table 7. Although the effects of early same-sex marriage legalization is similar for gay and lesbian couples, the effects of Obergefell are significantly larger for lesbian couples compared to gay couples

in both Obergafell states and Early Legalization states. These differences are in line with prior literature. Several studies document a greater take-up of marriage among lesbian couples relative to gay couples (Carpenter and Gates, 2008; Badgett and Mallory, 2014a; Ramos et al., 2009). The absence of these differences when estimating effects of early legalization could be explained by differences in the probabilities of moving between state lines as a result of a change in marriage legalization. Marcén and Morales (2022) finds that gay men are significantly more likely to move to states which recently legalized same-sex marriage.[39]

7 County Level Analysis

Next, we consider effects at the county-level. The HMDA data contain county identifiers so we are able to measure within-state heterogeneity in the effects of same sex marriage legalization and the Obergefell v. Hodges ruling. Same-sex populations choose where to live non-randomly and we have a wide distribution in the proportion of same-sex couples residing in each county (Badgett et al., 2021). Historically, gay and lesbian individuals have congregated in "gayborhoods" in large metropolitan cities in order to escape discrimination but there is growing evidence that sexual minorities are now becoming more geographically disperse, potentially as a result of increasing acceptance (Ghaziani, 2016; Spring, 2013). Although more research is required in order to understand the relationship between greater social acceptance and spacial dispersal of same-sex couples, we could expect that same-sex marriage legalization and the Obergefell v. Hodges ruling might make areas which were previously less accepting, more desirable locations for same-sex couples. There is growing

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[39] We mostly expect differences in moving probabilities to affect estimates for early legalization states. All states legalized same-sex marriage after the Obergefell v Hodges ruling and same-sex couples have no incentive to move in order to gain access to same-sex marriage. However, it is possible that the Obergefell ruling induces certain couples to move from early legalization states to Obergefell states.

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interest in understanding whether greater social acceptance of sexual minorities has resulted in suburbanization (Podmore and Bain, 2020).

In order to understand geographical heterogeneity in the effects of same-sex marriage legalization and the Obergefell v. Hodges ruling, we reestimate our models at the county level. We obtain Rural-Urban Continuum Codes to identify counties as either metropolitan, suburban or other (Parker, 2013).[40] We reestimate Equation 2 and Equation 4 for urban, suburban, and other counties. Estimates are presented in Table 8. Estimates suggest that effects are driven almost entirely by changes in metropolitan areas. We find little evidence of suburbanization of gay and lesbian couples following same-sex marriage legalization and the Obergefell v. Hodges ruling. Although we find no evidence of suburbanization, the HMDA data only allows us to observe mortgage applications at the county level. There may be within county movements that we are unable to capture in our estimates.

8 Conclusion

This paper explores the effects of same-sex marriage legalization and the 2015 Obergefell v. Hodges ruling on mortgage demand among same-sex couples relative to different sex couples. We first replicate findings from Miller and Park (2018) and show that early same-sex marriage legalization increases mortgage demand among same-sex couples relative to different sex couples. Thereafter, we explore the effect of the 2015 ruling itself. Although the ruling expanded access to same-sex marriage, it is not immediately apparent that it would increase mortgage demand in the same-way that early legalization did. Early legalization states may be systematically different from late legalization states in terms of the underlying demand for same-sex marriage and mortgage credit among same-sex couples. We find that the ruling not only increases

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[40]Rural-Urban Continuum codes are produced by the United States Department of Agriculture and allow us to differentiate between metropolitan, suburban and other counties by population size.

mortgage demand among same-sex couples living in states which previously did not have legal same-sex marriage but also increases mortgage demand among same-sex couples living in states which had already legalized same-sex marriage. We then separately estimate effects of the ruling on same-sex female couples and same-sex male couples. In line with the literature exploring the effects on marriage take-up, we find significantly larger effects on same-sex female couples (Carpenter and Gates, 2008; Badgett and Mallory, 2014a; Ramos et al., 2009). Thereafter, we exploit county-level data to explore within state heterogeneity on effects. We find that effects are almost entirely driven by changes in mortgage demand in metropolitan counties. We also find little evidence of the ruling resulting in suburbanization of same-sex couples.

We contribute to a growing literature exploring the effects of same-sex marriage legalization by highlighting the important role of national legislation shaping outcomes for sexual minorities. A ruling by the Supreme Court not only expanded access to same-sex marriage but further cemented the rights of sexual minorities who already had access to many of these rights. By focusing on state-level changes and ignoring substantial national policy changes, we miss meaningful aspects of policy effects.

Given the central role of the Supreme Court in shaping U.S. law and policy, the findings of this study may have implications beyond same-sex marriage legalization and policies affecting sexual minorities. Our findings suggest a broader influence of landmark judicial decisions. For researchers, our findings highlight the importance of considering the wider impacts of such rulings, beyond their immediate legal scope.

9 Figures

Figure 1: Scatter Plot Comparing HMDA Data to ACS Data
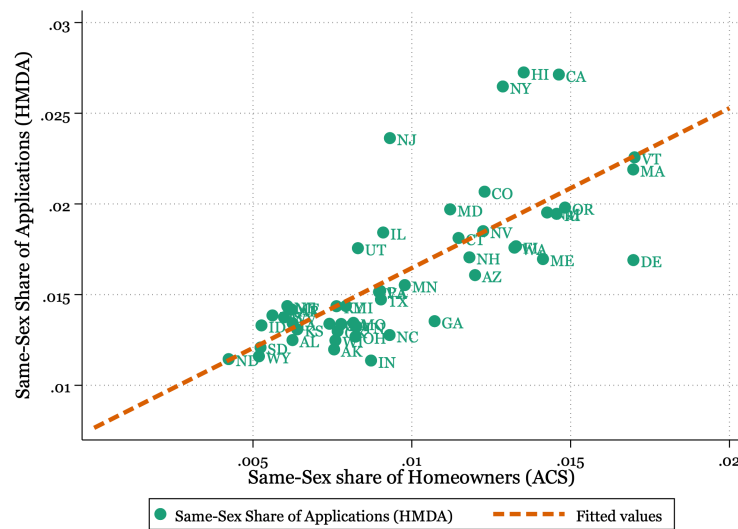
Figure 1. Source: HMDA (Consumer Financial Protection Bureau, 2023) and American Community Survey (ACS)(Flood et al., 2023).

Notes: The figure presents a scatter plot and a line of best fit comparing the share of same-sex applications in the HMDA dataset to the share of same-sex homeowners in the ACS. We use data from the years 2008-2019 because several researchers have documented problems with using ACS data in order to identify same-sex couples in earlier years (Gates and Steinberger, 2009; Badgett et al., 2021).

Figure 2: Trends in Mortgage Application Rates from same-sex and difference sex couples from 1998-2019
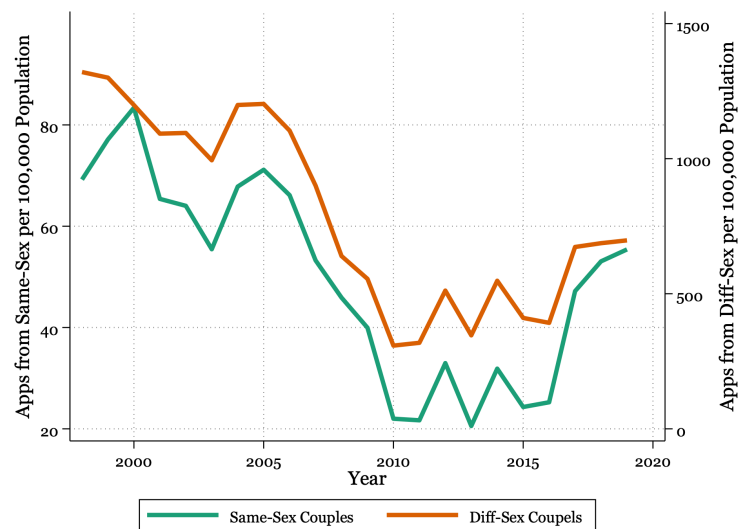
Figure 2. Source: HMDA (Consumer Financial Protection Bureau, 2023)
Notes: The figure presents trends in the number of applications from same-sex and different-sex couples per 100,000 population in the HMDA Dataset for the year 1998-2019.

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Figure 3: Estimates from Equation 1 - The Effect of Same-Sex Marriage Legalization on Mortgage Demand Among Same-Sex Couples Relative to Different-Sex Couples

Figure 3. Source: HMDA (Consumer Financial Protection Bureau, 2023)
Notes: The figure depicts the effects of same-sex marriage legalization on the mortgage demand of same-sex couples in Early Legalization states. The figure presents estimates from Equation 1. Estimations include controls for domestic partnership laws, state-time fixed effects, orientation-time fixed effects and state-orientation fixed effects. All estimates are weighted by state population and standard errors are clustered at the state level.

Figure 4: Estimates from Equation 3 - The Effect of the Obergefell v. Hodges Ruling on Mortgage Demand Among Same-Sex Couples Relative to Different-Sex Couples
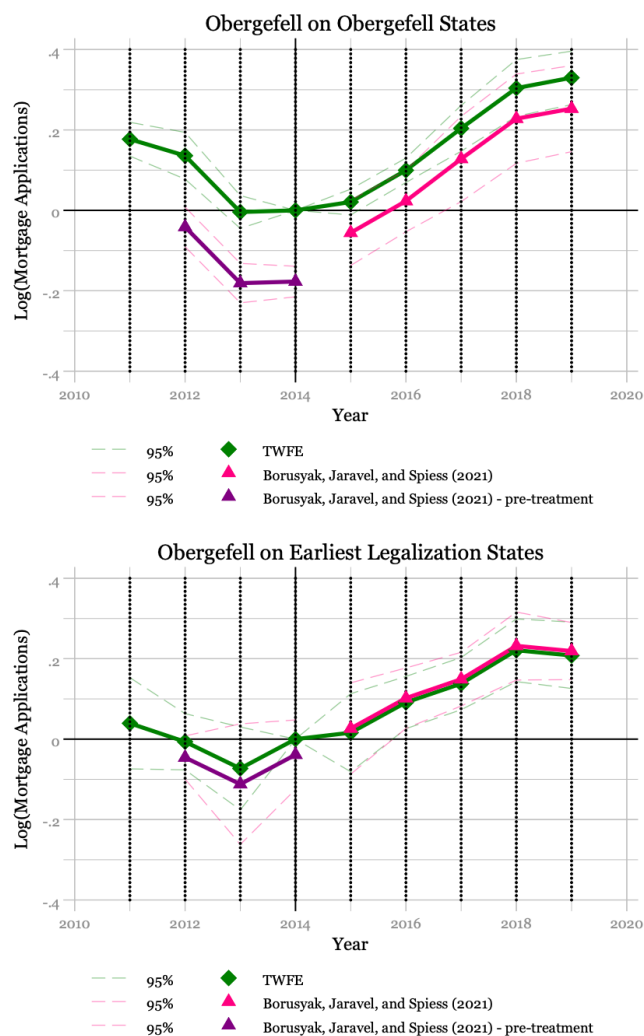
Figure 4. Source: HMDA (Consumer Financial Protection Bureau, 2023)
Notes: The figure depicts the effect of the Obergefell v. Hodges ruling on the mortgage demand of same-sex couples in Obergefell states and Earliest Legalization states. State categories are available in Table 1. The figures present estimates from Equation 3. Estimations include controls for domestic partnership laws, unemployment rate, median household income, proportion of the population that is white, under 25 and 25-44. We also include state fixed effects, time fixed effects and orientation fixed effects. All estimates are weighted by state population and standard errors are clustered at the state level.

Figure 5: Estimates from Equation 1 & Equation 3 - The Effect of Same-Sex
Marriage Legalization and Obergefell v. Hodges on Mortgage Demand Among Gay
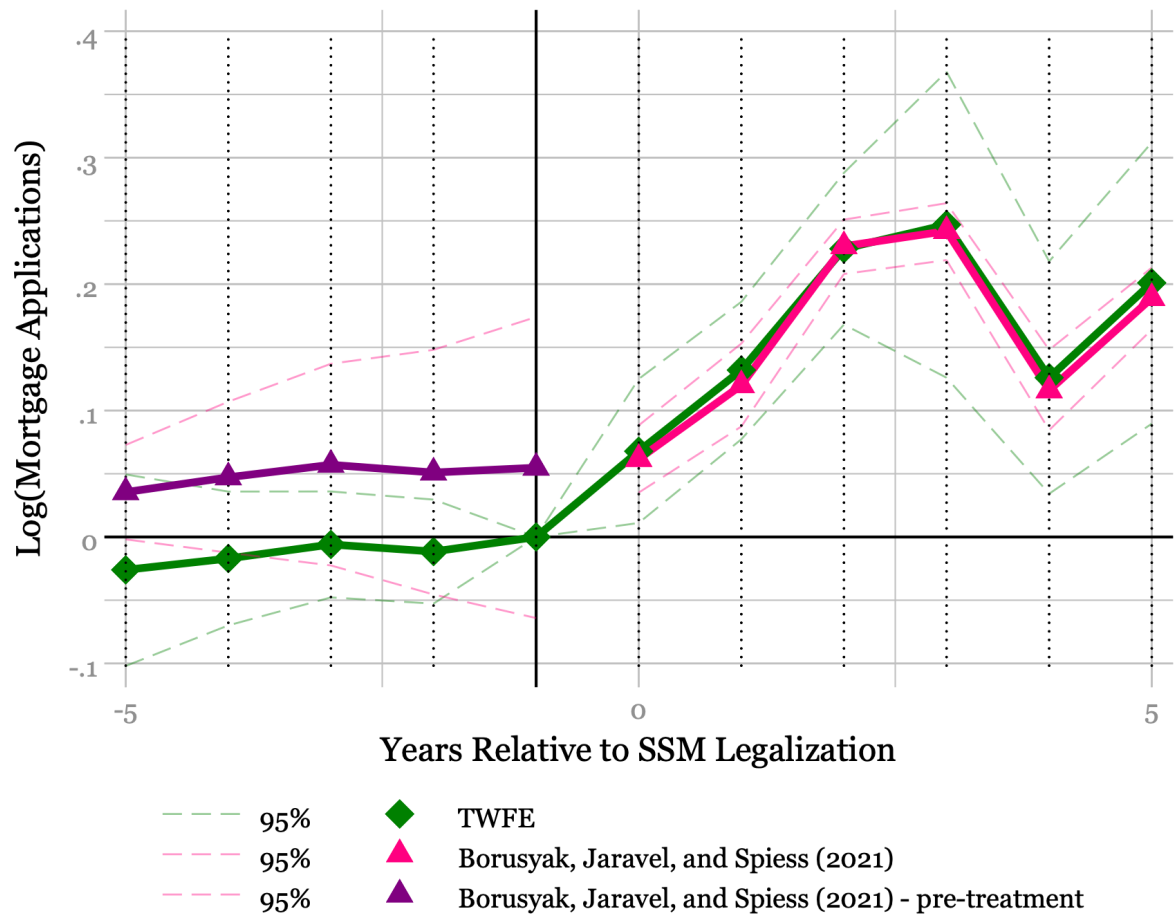and Lesbian Couples Relative to Different-Sex Couples
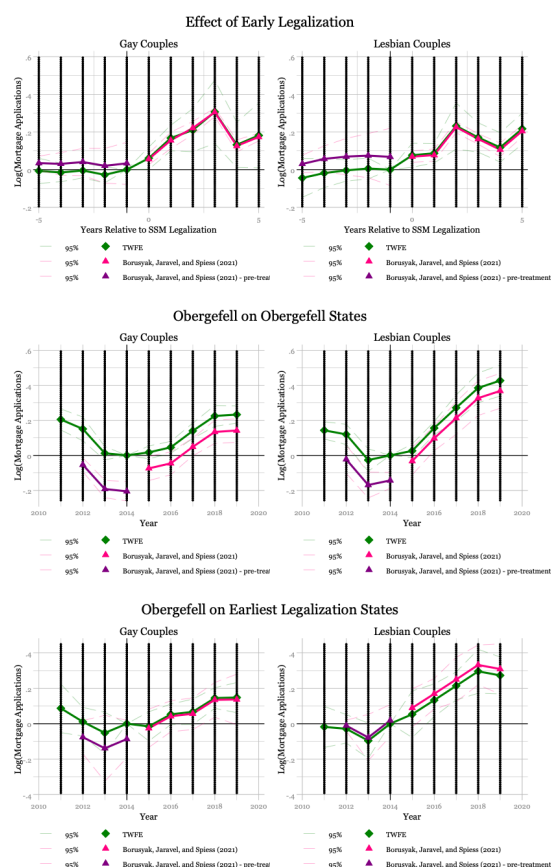
Figure 5. Source: HMDA (Consumer Financial Protection Bureau, 2023
Notes: The first row depicts the effects of early same-sex marriage legalization on the
mortgage demand of same-sex male and same-sex female couples. The figures present
estimates from Equation 1. Estimations include controls for domestic partnership laws,
state-time fixed effects, orientation-time fixed effects and state-orientation fixed effects. The
next two rows depict the effect of the Obergefell v. Hodges ruling on the mortgage demand
of same-sex male and same-sex female couples in Obergefell states and Earliest Legalization
states. State categories are available in Table 1. The figures present estimates from Equation
3. Estimations include controls for Domestic Partnership Laws, unemployment rate, median
household income, proportion of the population that is white, under 25 and 25-44. We also
include state fixed effects, time fixed effects and orientation fixed effects. All estimates are
weighted by state population and standard errors are clustered at the state level.

10   Tables

Table 1: Same-Sex Marriage Legalization Year

State	State	Year of Legalization	Method	Type
MA	Massachusetts	2004	Judicial	
CT	Connecticut	2008	Judicial	
IA	Iowa	2009	Judicial	
VT	Vermont	2009	Legislative	Earliest Legalization States
DC	District of Columbia	2010	Legislative	
NH	New Hampshire	2010	Legislative	
NY	New York	2011	Legislative	
ME	Maine	2012	Referendum	
WA	Washington	2012	Legislative	
DE	Delaware	2013	Legislative	
MD	Maryland	2013	Referendum	
MN	Minnesota	2013	Legislative	
RI	Rhode Island	2013	Legislative	
CA	California	2013	Judicial	
HI	Hawaii	2013	Legislative	
NJ	New Jersey	2013	Judicial	
NM	New Mexico	2013	Judicial	
AK	Alaska	2014	Judicial	
AZ	Arizona	2014	Judicial	
CO	Colorado	2014	Judicial	
ID	Idaho	2014	Legislative	Expanded Early Legalizeration States
IL	Illinois	2014	Legislative	
IN	Indiana	2014	Judicial	
MT	Montana	2014	Judicial	
NC	North Carolina	2014	Judicial	
NV	Nevada	2014	Judicial	
OR	Oregon	2014	Judicial	
PA	Pennsylvania	2014	Judicial	
UT	Utah	2014	Judicial	
WI	Wisconsin	2014	Judicial	
WV	West Virginia	2014	Judicial	
OK	Oklahoma	2014	Judicial	
VA	Virginia	2014	Judicial	
SC	South Carolina	2014	Judicial	
AL	Alabama	2015	Supreme Court	
AR	Arkansas	2015	Supreme Court	
FL	Florida	2015	Supreme Court	
GA	Georgia	2015	Supreme Court	
KS	Kansas	2015	Supreme Court	
KY	Kentucky	2015	Supreme Court	
LA	Louisiana	2015	Supreme Court	
MI	Michigan	2015	Supreme Court	
MS	Mississippi	2015	Supreme Court	Obergefell States
MO	Missouri	2015	Supreme Court	
ND	North Dakota	2015	Supreme Court	
NE	Nebraska	2015	Supreme Court	
OH	Ohio	2015	Supreme Court	
SD	South Dakota	2015	Supreme Court	
TN	Tennessee	2015	Supreme Court	
TX	Texas	2015	Supreme Court	

Table 1. Source: Sansone (2019)
Notes: The table depicts the year when same-sex marriage was legalized in each U.S. state, the method by which it was legalized, and categorized each state as eather an earliest legalization state, an expanded early legalization state, or an Obergefell State.

Table 2: Summary Statistics by Legalization Year

Category from Table 1	Before 2011 Earliest Legalization	2012-2014 Expanded Early	2015 Obergefell
Share of Mortgage Apps from Same-Sex Couples	0.075 (0.022)	0.062 (0.017)	0.055 (0.013)
Share of BRFSS Same-Sex Couples	0.034 (0.013)	0.029 (0.011)	0.029 (0.009)
Share of ACS Same-Sex Couples	0.016 (0.008)	0.012 (0.004)	0.010 (0.003)
Domestic Partnership Law	0.014 (0.117)	0.285 (0.452)	0.000 (0.000)
Unemployment Rate	5.396 (1.661)	5.880 (2.155)	5.756 (2.002)
Proportion White	0.790 (0.098)	0.799 (0.091)	0.796 (0.077)
Proportion of Population under 25	0.323 (0.014)	0.340 (0.023)	0.343 (0.027)
Proportion of Population 25-44	0.278 (0.023)	0.279 (0.020)	0.272 (0.019)
Observations	154	616	352

mean coefficients; sd in parentheses

Table 2. Source: HMDA (Consumer Financial Protection Bureau, 2023), Behavioral Risk Factor Surveillance System (BRFSS) (CDC, 1990-2002), and American Community Survey (ACS)(Flood et al., 2023).
Notes: The table presents summary statistics for states by the year of same-sex marriage legalization for the years 1998-2019.

Table 3: Summary Statistics by Applicant Type

Full Sample: 1998-2019			
	Same-Sex: Male	Same-Sex: Female	Different Sex
Loan Denied	0.148	0.175	0.107
	(0.071)	(0.105)	(0.054)
FHA Loan	0.313	0.303	0.178
	(0.160)	(0.161)	(0.104)
Different Race Co-Applicant	0.035	0.036	0.045
	(0.028)	(0.031)	(0.034)
Annual Income (1000's of USD)	114.461	87.576	102.325
	(59.028)	(63.994)	(57.166)
Loan Amount (1000's of USD)	173.615	157.862	201.931
	(86.311)	(73.961)	(87.032)
Observations	1144	1145	1148
Detailed Sample: 2018-2019			
	Same-Sex: Male	Same-Sex: Female	Different Sex
Interest Rate	4.791	4.686	4.631
	(1.487)	(0.386)	(0.540)
Property Value (1000's of USD)	310.918	276.349	359.571
	(132.453)	(123.777)	(134.281)
Debt-to-Income Ratio	40.754	42.177	38.933
	(1.858)	(1.737)	(1.696)
Applicant Age	38.369	41.277	42.240
	(1.912)	(2.020)	(1.874)
Observations	104	105	106

mean coefficients; sd in parentheses

Table 3. Source: HMDA (Consumer Financial Protection Bureau, 2023)
Notes: The table provides summary statistics for applications where the applicants are both of the same-sex and male, same-sex and female, and different sex. The first panel uses data from 1998-2019. The second panel only provides statistics for the year 2018-2019 because these variables are only provided in 2018 onwards in the HMDA data.

Equation 2: Estimates from Equation 2 - The Effect of Same-Sex Marriage
Legalization on Mortgage Demand Among Same-Sex Couples Relative to
Different-Sex Couples

	Effect of Early Legalization	
	(1) TWFE	(2) Borusyak
SSM X Same-Sex Couple	0.11437**	0.12304***
	(0.044)	(0.009)
Observations	1734	1734
State-Year FE	Yes	Yes
Year-Orientation FE	Yes	Yes
State-Orientation FE	Yes	Yes
P-Value	.00039	0
Wild Cluster P-Value	.003	-

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4. Source: HMDA (Consumer Financial Protection Bureau, 2023)
Notes: The table provides estimates from Equation 2 of the effect of same-sex marriage legalization on the mortgage demand of same-sex couples in Early Legalization states. The first column provides estimates using the two way fixed effects estimator and the second column presents estimates using the Imputation Estimator developed by Borusyak et al. (2021). Estimations include controls for domestic partnership laws, state-time fixed effects, orientation-time fixed effects and state-orientation fixed effects. All estimates are weighted by state population and standard errors are clustered at the state level.

Table 5: Estimates from Equation 4 - The Effect of the Obergefell v. Hodges Ruling on Mortgage Demand Among Same-Sex Couples Relative to Different-Sex Couples

Obergefell on Obergefell States		
	(1)	(2)
	TWFE	Borusyak
Obergefell X Same-Sex Couple	0.11636***	0.11636***
	(0.017)	(0.033)
Observations	288	288
State FE	Yes	Yes
Year FE	Yes	Yes
Orientation FE	Yes	Yes
P-Value	0	.00038
Wild Cluster P-Value	0	-
Obergefell on Early Legalization States		
	(1)	(2)
	TWFE	Borusyak
Obergefell X Same-Sex Couple	0.14533***	0.14591***
	(0.016)	(0.052)
Observations	108	108
State FE	Yes	Yes
Year FE	Yes	Yes
Orientation FE	Yes	Yes
P-Value	.00025	.00506
Wild Cluster P-Value	.01502	-

Table 5. HMDA (Consumer Financial Protection Bureau, 2023)

Notes: The table provides estimates from Equation 4 of the effect of the Obergefell v. Hodges ruling on mortgage demand of same-sex couples in Obergefell states (first panel) and Earliest Legalization states (second panel). State categories are available in Table 1. The first column provides estimates using the two-way fixed effects estimator and the second column presents estimates using the Imputation Estimator developed by Borusyak et al. (2021). Estimations include controls for domestic partnership laws, unemployment rate, median household income, proportion of the population that is white, under 25 and 25-44. We also include state fixed effects, time fixed effects and orientation fixed effects. All estimates are weighted by state population and standard errors are clustered at the state level.

: Estimates from Equation 2 & Equation 4 - Only Biracial Couples and Only

Accepted Applications

Early Legalization States

	Only Biracial		Only Accepted Apps	
	(1) TWFE	(2) Borusyak	(3) TWFE	(4) Borusyak
SSM X Same-Sex Couple	0.05324	0.07352***	0.12253***	0.13254***
	(0.061)	(0.025)	(0.025)	(0.010)
Observations	1708	1721	1734	1734
State-Year FE	Yes	Yes	Yes	Yes
Year-Orientation FE	Yes	Yes	Yes	Yes
State-Orientation FE	Yes	Yes	Yes	Yes

Obergefell on Obergefell States

	Only Biracial		Only Accepted Apps	
	(1) TWFE	(2) Borusyak	(3) TWFE	(4) Borusyak
SSM X Same-Sex Couple	0.15266***	0.15390***	0.14946***	0.14957***
	(0.035)	(0.038)	(0.015)	(0.029)
Observations	621	621	630	630
State-Year FE	Yes	Yes	Yes	Yes
Year-Orientation FE	Yes	Yes	Yes	Yes
State-Orientation FE	Yes	Yes	Yes	Yes

Obergefell on Early Legalization States

	Only Biracial		Only Accepted Apps	
	(1) TWFE	(2) Borusyak	(3) TWFE	(4) Borusyak
SSM X Same-Sex Couple	0.30115***	0.30174***	0.18780***	0.18827***
	(0.072)	(0.056)	(0.031)	(0.059)
Observations	107	107	108	108
State-Year FE	Yes	Yes	Yes	Yes
Year-Orientation FE	Yes	Yes	Yes	Yes
State-Orientation FE	Yes	Yes	Yes	Yes

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6. Source: HMDA (Consumer Financial Protection Bureau, 2023)
Notes: The first panel depicts the effects of early same-sex marriage legalization on mortgage demand while restricting the sample to either biracial couples (left) or accepted applications only (right). This panel provides estimates from Equation 2. Estimations include controls for domestic partnership laws, state-time fixed effects, orientation-time fixed effects and state-orientation fixed effects. The next two panels depict the effects of the Obergefell v. Hodges ruling on mortgage demand while restricting the sample to either biracial couples (left) or accepted applications (right) in Obergefell states (second panel) and Earliest Legalization states (third panel). State categories are available in Table 1. These panels provide estimates from Equation 4. Estimations include controls for domestic partnership Laws, unemployment rate, median household income, proportion of the population that is white, under 25 and 25-44. We also include state fixed effects, time fixed effects and orientation fixed effects. Columns 1 and 3 provide two-way fixed effects estimates while columns 2 and 4 provide the Imputation Estimator developed by Borusyak et al. (2021). All estimates are weighted by state population and standard errors are clustered at the state level.

Table 7: Estimates from Equation 2 & Equation 4 - Gay and Lesbian Couples

	Early Legalization States			
	Gay		Lesbian	
	(1) TWFE	(2) Borusyak	(3) TWFE	(4) Borusyak
SSM X Same-Sex Couple	0.12723***	0.13266***	0.09790***	0.11009***
	(0.038)	(0.010)	(0.029)	(0.011)
Observations	1734	1734	1734	1734
State-Year FE	Yes	Yes	Yes	Yes
Year-Orientation FE	Yes	Yes	Yes	Yes
State-Orientation FE	Yes	Yes	Yes	Yes
	Obergefell on Obergefell States			
	Gay		Lesbian	
	(1) TWFE	(2) Borusyak	(3) TWFE	(4) Borusyak
Obergefell X Same-Sex Couple	0.04184**	0.04183	0.19606***	0.19606***
	(0.017)	(0.029)	(0.024)	(0.041)
Observations	288	288	288	288
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Orientation FE	Yes	Yes	Yes	Yes
	Obergefell on Early Legalization States			
	Gay		Lesbian	
	(1) TWFE	(2) Borusyak	(3) TWFE	(4) Borusyak
Obergefell X Same-Sex Couple	0.06861***	0.06934**	0.22955***	0.23030***
	(0.015)	(0.035)	(0.017)	(0.042)
Observations	108	108	108	108
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Orientation FE	Yes	Yes	Yes	Yes

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7. Source: HMDA (Consumer Financial Protection Bureau, 2023)

Notes: The first panel depicts the effects of early same-sex marriage legalization on the mortgage demand of same-sex male and same-sex female applicants. This panel presents estimates from Equation 2. Estimations include controls for domestic partnership laws, state-time fixed effects, orientation-time fixed effects and state-orientation fixed effects. The next two panels depict the effect of the Obergefell v. Hodges ruling on the mortgage demand of same-sex male and same-sex female applicants in Obergefell states and Earliest Legalization states. State categories are available in Table 1. These panels present estimates from Equation 4. Estimations include controls for domestic partnership Laws, unemployment rate, median household income, proportion of the population that is white, under 25 and 25-44. We also include state fixed effects, time fixed effects and orientation fixed effects. Columns 1 and 3 provide two-way fixed effects estimates while columns 2 and 4 provide the Imputation Estimator developed by Borusyak et al. (2021). All estimates are weighted by state population and standard errors are clustered at the state level.

Early Legalization States

	Metro		Suburb		Other	
	(1) TWFE	(2) Borusyak	(3) TWFE	(4) Borusyak	(5) TWFE	(6) Borusyak
SSM X Same-Sex Couple	0.09839***	0.10807***	0.02969	0.05421**	0.03516	0.03162
	(0.023)	(0.007)	(0.043)	(0.022)	(0.047)	(0.034)
Observations	29444	29619	14168	14462	6152	6289
County-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County-Orientation FE	Yes	Yes	Yes	Yes	Yes	Yes
Orientation-Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Obergefell on Obergefell States

	Metro		Suburb		Other	
	(1) TWFE	(2) Borusyak	(3) TWFE	(4) Borusyak	(5) TWFE	(6) Borusyak
SSM X Same-Sex Couple	0.10736***	0.11537***	-0.09192*	-0.07620**	-0.00865	0.00555
	(0.017)	(0.040)	(0.052)	(0.032)	(0.043)	(0.042)
Observations	12649	12649	6561	6561	2739	2739
Domestic Partnership	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Orientation FE	Yes	Yes	Yes	Yes	Yes	Yes

Obergefell on Early Legalization States

	Metro		Suburb		Other	
	(1) TWFE	(2) Borusyak	(3) TWFE	(4) Borusyak	(5) TWFE	(6) Borusyak
SSM X Same-Sex Couple	0.15432***	0.15431***	0.00725	0.01491	0.04058	0.07342
	(0.017)	(0.045)	(0.038)	(0.127)	(0.081)	(0.129)
Observations	630	630	287	287	244	244
Domestic Partnership	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Orientation FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 8. Source: HMDA (Consumer Financial Protection Bureau, 2023)
Notes: This table presents estimates for the effects of same-sex marriage legalization and the Obergefell v. Hodges ruling for metropolitan, suburban or other counties based on rural urban county continuum codes Parker (2013). The first panel depicts the effects of early marriage legalization on the demand for mortgage credit . This panel presents estimates for Equation 2. Estimates include controls for domestic partnership laws, state-time fixed effects, orientation-time fixed effects and state-orientation fixed effects. The next two panels depict the effect of the Obergefell v. Hodges ruling on the demand for mortgage credit in Obergefell states and Earliest Legalization states. State categories available in Table 1. These panels present estimates for Equation 4. Estimates include controls for Domestic Partnership Laws, unemployment rate, median household income, proportion of the population that is white, under 25 and 25-44. We also include state fixed effects, time fixed effects and orientation fixed effects. Columns 1, 3, and 5 provide estimates using the two-way fixed effects estimator while columns 2, 4, and 6 use the imputation estimator developed by Borusyak et al. (2021). All estimates are weighted by state population and standard errors are clustered at the state level.

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A   Additional Tables and Figures

Table A1: Estimates from Equation 2 & Equation 4 - Alternative Specifications

Early Legalization States

	No Controls		No Weights		Linear Time Trends	
	(1)	(2)	(3)	(4)	(5)	(6)
	TWFE	Borusyak	TWFE	Borusyak	TWFE	Borusyak
SSM X Same-Sex Couple	0.11729***	0.12304***	0.09753**	0.10840***	0.11391***	0.12265***
	(0.028)	(0.009)	(0.039)	(0.024)	(0.030)	(0.009)
Observations	1734	1734	1734	1734	1734	1734
State-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Orientation FE	Yes	Yes	Yes	Yes	Yes	Yes
State-Orientation FE	Yes	Yes	Yes	Yes	Yes	Yes
State-Orientation Time Trends	No	No	No	No	Yes	Yes

Obergefell on Obergefell States

	No Controls		No Weights		Linear Time Trends	
	(1)	(2)	(3)	(4)	(5)	(6)
	TWFE	Borusyak	TWFE	Borusyak	TWFE	Borusyak
SSM X Same-Sex Couple	0.11636***	0.11636**	0.11636***	0.09450	0.29250***	0.29250**
	(0.016)	(0.047)	(0.016)	(0.060)	(0.019)	(0.123)
Observations	288	288	288	288	288	288
State-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Orientation FE	Yes	Yes	Yes	Yes	Yes	Yes
State-Orientation FE	Yes	Yes	Yes	Yes	Yes	Yes
State-Orientation Time Trends	No	No	No	No	Yes	Yes

Obergefell on Early Legalization States

	No Controls		No Weights		Linear Time Trends	
	(1)	(2)	(3)	(4)	(5)	(6)
	TWFE	Borusyak	TWFE	Borusyak	TWFE	Borusyak
SSM X Same-Sex Couple	0.14719***	0.14719***	0.10401**	0.10401	0.32819***	0.32738***
	(0.013)	(0.038)	(0.038)	(0.094)	(0.016)	(0.117)
Observations	108	108	108	108	108	108
State-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Orientation FE	Yes	Yes	Yes	Yes	Yes	Yes
State-Orientation FE	Yes	Yes	Yes	Yes	Yes	Yes
State-Orientation Time Trends	No	No	No	No	Yes	Yes

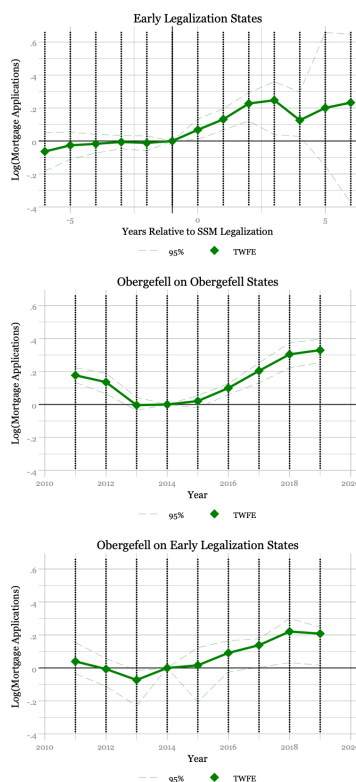Appendix Table A1. Source: HMDA (Consumer Financial Protection Bureau, 2023)
Notes: This table presents estimates for the effects of same-sex marriage legalization and the Obergefell v. Hodges ruling on mortgage demand for several alternative specifications. For the first two columns, I drop all the control variables. In columns 3 and 4, I provide unweighted estimates. In columns 5 & 6, I change the outcome variable to represent the residual of a state specific predicted time trend variable. This is calculated by using only pre-years to estimate a coefficient which measures linear time trends in the outcome variable for each state and then using these coefficients to estimate a linear time trend for each state-year combination. The first panel depicts the effects of early marriage legalization on the demand for mortgage credit . This panel presents estimates for Equation 2. Estimates include controls for domestic partnership laws, state-time fixed effects, orientation-time fixed effects and state-orientation fixed effects. The next two panels depict the effect of the Obergefell v. Hodges ruling on the demand for mortgage credit in Obergefell states and Earliest Legalization states. State categories available in Table 1. These panels present estimates for Equation 4. Estimates include controls for Domestic Partnership Laws, unemployment rate, median household income, proportion of the population that is white, under 25 and 25-44. We also include state fixed effects, time fixed effects and orientation fixed effects. Columns 1, 3, and 5 provide estimates using the two-way fixed effects estimator while columns 2, 4, and 6 use the imputation estimator developed by Borusyak et al. (2021). All estimates are weighted by state population and standard errors are clustered at the state level.

Figure A1: Estimates from detrended version of Equation 1 & Equation 3.
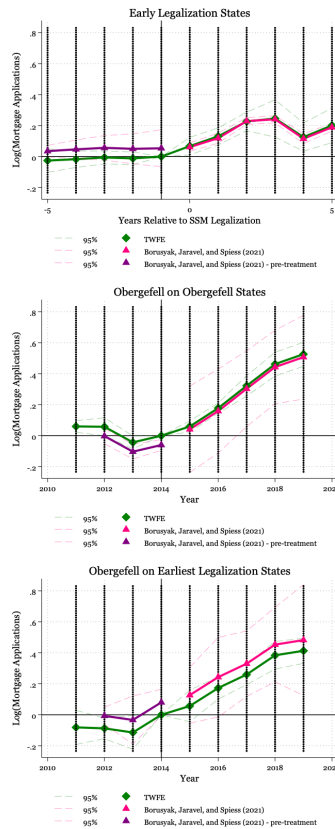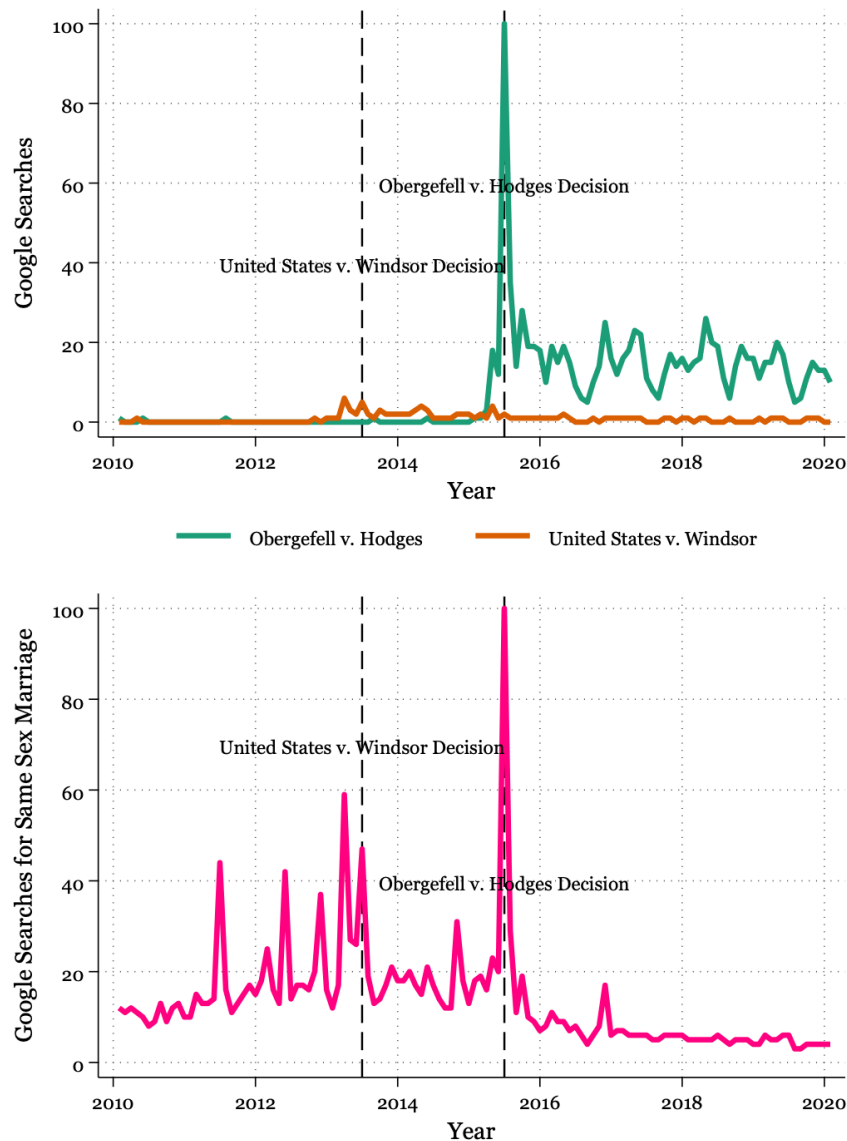

Appendix Figure A1. Source: HMDA (Consumer Financial Protection Bureau, 2023)
Notes: The figure depicts the effect of same-sex marriage legalization and the Obergefell
v. Hodges ruling on the demand for mortgage credit. Here, we follow Goodman-Bacon
(2021) and detrend the outcome variable. This involves changing the outcome variable to
represent the residual of a state specific predicted time trend variable. This is calculated
by using only pre-years to estimate a coefficient which measures linear time trends in the
outcome variable for each state and then using these coefficients to estimate a linear time
trend for each state-year combination. The first panel depicts the effects of early marriage
legalization on the demand for mortgage credit . This panel presents estimates for Equa-
tion 1. Estimates include controls for domestic partnership laws, state-time fixed effects,
orientation-time fixed effects and state-orientation fixed effects. The next two panels depict
the effect of the Obergefell v. Hodges ruling on the demand for mortgage credit in Oberge-
fell states and Earliest Legalization states. State categories available in Table 1. These
panels present estimates for Equation 3. Estimates include controls for Domestic Partner-
ship Laws, unemployment rate, median household income, proportion of the population
that is white, under 25 and 25-44. We also include state fixed effects, time fixed effects
and orientation fixed effects. All estimates are weighted by state population and standard
errors are clustered at the state level.

Figure A2: Estimates from Equation 1 & Equation 3 with Wild Cluster

Bootstrapping.

Appendix Figure A2. Source: HMDA (Consumer Financial Protection Bureau, 2023)
Notes: The figure depicts the effect of same-sex marriage legalization and the Obergefell v.
Hodges ruling on the demand for mortgage credit. In order to account for the small number
of clusters, we use wild cluster bootstrapping with 999 repetitions Cameron et al. (2008).
In order to achieve 999 repetitions, we follow advice from Roodman et al. (2019) and in-
corporate web weights. The first panel depicts the effects of early marriage legalization on
the demand for mortgage credit . This panel presents estimates for Equation 1. Estimates
include controls for domestic partnership laws, state-time fixed effects, orientation-time
fixed effects and state-orientation fixed effects. The next two panels depict the effect of
the Obergefell v. Hodges ruling on the demand for mortgage credit in Obergefell states
and Earliest Legalization states. State categories available in Table 1. These panels present
estimates for Equation 3. Estimates include controls for Domestic Partnership Laws, unem-
ployment rate, median household income, proportion of the population that is white, under
25 and 25-44. We also include state fixed effects, time fixed effects and orientation fixed
effects. All estimates are weighted by state population and standard errors are clustered at
the state level.

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Figure A3: Google Trends

Appendix Figure A3. Source: Google Trends

Notes: This figure presents trends in google search intensities for specific terms. The intensity index is based on search share normalized between 0 and 100. The first graph depicts trends in the search intensity index for the terms "United v. Windsor" and "Obergefell v. Hodges". The second figure depicts trends in the search intensity index for the term "Same Sex Marriage".

Figure A4: Estimates from Equation 1 & Equation 3- Effect on Couple Application vs Single Filer Applications.
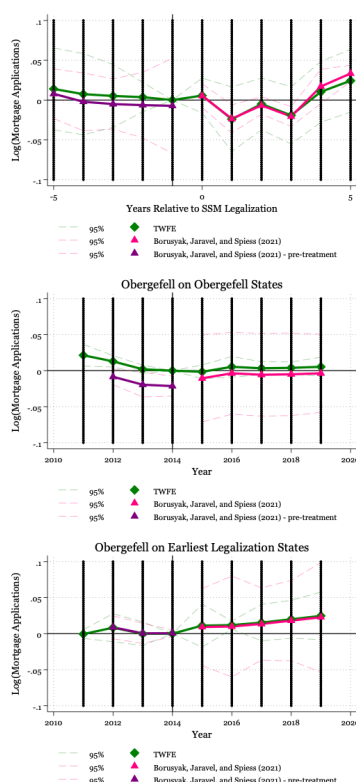
Appendix Figure A4. Source: HMDA (Consumer Financial Protection Bureau, 2023)
Notes: The figure depicts the effect of same-sex marriage legalization and the Obergefell v. Hodges ruling on the demand for mortgage credit on couple relative to other groups. The first panel depicts the effects of early marriage legalization on the demand for mortgage credit among couple applicants relative to other applications. This panel presents estimates for Equation 1. Estimates include controls for domestic partnership laws, state-time fixed effects, orientation-time fixed effects and state-orientation fixed effects. The next two panels depict the effect of the Obergefell v. Hodges ruling on the demand for mortgage credit in Obergefell states and Earliest Legalization states among couple applicants relative to other applications. State categories available in Table 1. These panels present estimates for Equation 3. Estimates include controls for Domestic Partnership Laws, unemployment rate, median household income, proportion of the population that is white, under 25 and 25-44. We also include state fixed effects, time fixed effects and orientation fixed effects. All estimates are weighted by state population and standard errors are clustered at the state level.

B   Do our Findings have Implications for Other Settings? Same-Sex Marriage Legalization and Sexually Transmitted Infections.

In order to estimate the effects of a national policy following staggered rollout, researchers often consider earlier treated states as untreated states (Nikolaou, 2023a; Farin et al., 2021). Although researchers acknowledge problems with this design because it ignores dynamic trends experienced by a state following treatment, this method could yield particularly misleading results when estimating the effects of Obergefell v. Hodges. In addition to ignoring the dynamic trends experienced by a state following treatment, it also ignores the possibility that a national policy may have effects on states which were already treated. In this section, we show how our estimates change when we treat earlier treated states as untreated states in order to estimate the effects of the Obergefell v. Hodeges ruling on Obergefell states. Thereafter, we explore how accounting for the effect of the 2015 ruling on early legalization states affects findings from a related setting, the effects of same-sex marriage on sexually transmitted infections (STIs).

We first reestimate Equation 1 in order to estimate the effect of the Obergefell v. Hodges ruling on Obergefell states. We do not use this equation to estimate the effects of Obergefell in our main specification because it requires an untreated states. Now, we consider the earliest treated states as untreated states. Estimates are provided in Figure B.1. This specification fails to find an effect on Obergefell states. This is unsurprising given that the effects of Obergefell v. Hodges on states which did not offer same-sex marriage and states that had previously legalized same-sex marriage are in the same-direction and using the earliest treated states as

a control group will bias estimates downwards. As depicted in Figure 4, obergefell states and early legalization states may also experience different pre-trends making it particularly difficult to interpret the coefficients produced in Figure B.1.

Next, we explore how accounting for an effect of the 2015 ruling on early legalization states may affect findings from a related study. Nikolaou (2023a) estimates the effect of same-sex marriage legalization on sexually transmitted infections. They find that early legalization significantly decreases rates rates of STIs with the largest effects on rates of syphilis. They then use early treated states as a control group in order estimate the effect of the Obergefell v. Hodges ruling on Obergefell states since they lack a never treated group in the post-Obergefell years. They find no evidence of an effect of the ruling and argue that although early legalization may have played an important role in improving the sexual health of the population, national-level legalization which required all states to recognize same-sex marriage had little to no impact on STI rates. This specification ignores the possibility of the 2015 ruling having an impact on early treated states. In the absence of an untreated group, the strategy is employed as a next best alternative. This is particularly complicated in the case of STI rates because we do not observe orientation specific rates and must construct a control group with particular care.

In order to highlight the implications of our study on related settings, we reexplore the effects of Obergefell v. Hodges on rates of syphilis.[41] In the absence of an untreated state following the 2015 ruling, we exploit county level variation in the proportion of the population that is a sexual minority. Given that the ruling disproportionately affects the lives of sexual minorities, we expect larger effects in counties with a larger sexual minority population. We follow Eilam et al. (2021) and proxy sexual minority population by the share of partnerships that are same-sex in

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[41]We focus on syphilis because Nikolaou (2023a) finds the largest effect on rates of syphilis and syphilis rates are significantly higher among gay men.

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a county from the 2000 census. County level syphilis rates are available from the CDC Atlas from 2008 onward (Centers for Disease Control and Prevention, 2019).

Formally, we estimate the following equation:

$$\text{Log(Syphilis rate)}_{cst} = \alpha + \sum_{\substack{m \neq -1 \\ m=-6}}^{6} \beta_m \left(\text{SSM}_{stm} \times \text{share same-sex}_{cs}\right)$$

$$+(\text{Domestic Partnership}_{st} \times \text{share same-sex}_{cs}) + \gamma_c + \delta_{st} + \epsilon_{cst}$$

where $\text{Log(Syphilis rate)}_{cst}$ represents the log of syphilis rates in a particular county (c), in a state (s), in a year (t). SSM_{stm} represents the state-level passage of same-sex marriage legalization in state s during period m, where m ranges from six years before to six years after legalization. Share same-sex$_{cs}$ is measure of treatment intensity and represents the share of partnerships that are same-sex couples as per the 2000 census. In order to control for other changes in the legal landscape for same-sex couples, we control for the interaction of our treatment intensity variable (share same-sex$_{cs}$) with whether a state recognizes any sort of domestic partnerships or civil unions for same-sex couples (Domestic Partnership$_{st}$). We also control for county fixed effects, and state-time fixed effects.

We first estimate the effect of early legalization on syphilis rates. This involves estimating Equation 5 for the years 2008-2014. Estimates are provided in the first panel of Figure B.2. Consistent with Nikolaou (2023a), we find that early legalization decreases rates of syphilis. Thereafter, we explore the effects of the Obergefell v. Hodges ruling by estimating Equation 5 for the years 2011-2019 for Obergefell States and Early Legalization States. SSM_{stm} now measuress years relative to the Obergefell v. Hodges ruling. Estimates are provided in the second and third panel of Figure B.2. We find strong evidence that the Obergefell v.

Hodges ruling decreased rates of syphilis in Obergefell states and some evidence of noise around treatment for earliest legalization states. This is in contrast to Nikolaou (2023a) who finds that late legalization did not affect rates of syphilis.

These findings show that accounting for the potential effect of the Obergefell ruling on early legalization states can yield significantly different conclusions. We urge practitioners to be mindful of this effect and practice care in the selection of control groups when estimating policies with staggered rollout followed by universal adoption.
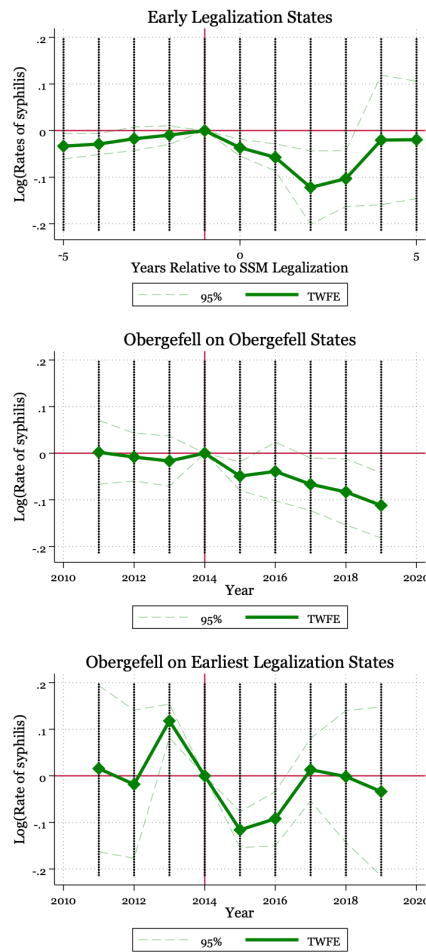
B.1   Figures

Figure B.1: Estimates from Equation 1 with Earliest Legalization States Serving as the Reference Group
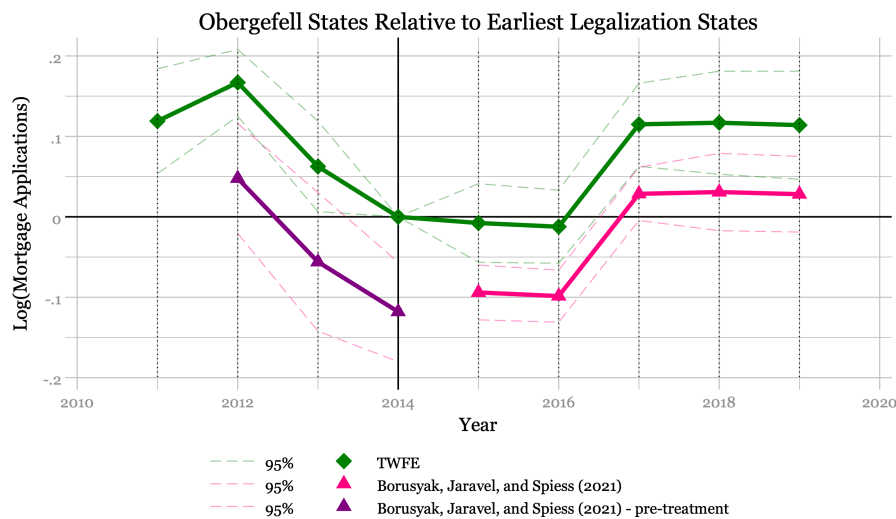
Appendix Figure B.1. Source: HMDA (Consumer Financial Protection Bureau, 2023) Notes: The figure depicts the effect of the Obergefell v. Hodges ruling on the demand for mortgage Credit in Obergefell states relative to Earliest Legalization states. State categories are available in Table 1. The figures presents estimates for Equation 1. Estimates include controls for domestic partnership laws, state-time fixed effects, orientation-time fixed effects and state-orientation fixed effects. All estimates are weighted by state population and standard errors are clustered at the state level

Figure B.2: Estimates from Equation 5 - The Effect of Same-Sex Marriage Legalization and Obergefell v. Hodges on Syphilis Rates

Appendix Figure B.2. Source: CDC Atlas (Centers for Disease Control and Prevention, 2019)

Notes: The figure depicts the effect of the Obergefell v. Hodges ruling on rates of Syphilis. State categories available in Table 1. The figures present estimates Estimates for Equation 5. We control for Domestic Partnership laws interacted with the share of the county population that is a same-sex couple. We also include state fixed effects, time fixed effects and orientation fixed effects. All estimates are weighted by state population and standard errors are clustered at the state level.

C Effects on Marriage Rates

Given that we find that the 2015 Obergefell v. Hodges ruling increases mortgage demand in both Obergefell and Early Legalization states, we might expect to see similar trends in the take-up of marriage. Unfortunately, there is limited data on rates of marriages between same-sex couples. Marriage rates are often calculated using marriage certificate data collected by the vital statistics of each state. The vast majority of states do not publish data regarding the number of marriage licenses issued to same-sex couples (Fisher et al., 2018).

In order to circumvent this problem, Fisher et al. (2018) uses restricted tax record data from the tax years 2013 and 2015. The vast majority of U.S. legally married couples file tax returns as married couples and changes in the proportion of same-sex married tax filers could indicate changes in marriage rates amongst them. Figure C.1 depicts their main finding. They document large increases in the number of same-sex couples filing taxes jointly between the tax years 2013 and 2015 for early legalization states as well as states which legalized same-sex marriage as a result of the Obergefell v. Hodges ruling. This could be indicative of an effect of the Obergefell v Hodges ruling on same-sex marriage rates in early legalization states. However, since we only observe this data for two points in time, we are unsure if the 2015 year represents a discontinuity in the number of same-sex marriages for early legalization states or whether this just represents trends in the number of married same-sex couples.

In order to further explore the effect of the Obergefell v. Hodges ruling on marriage rates, we then turn to survey data. Although, we have documented problems with the use of survey data for this type of analysis in section 3, it is the only readily available datasource to do this analysis. We use data from the American Community Survey (ACS) because it allows us to identify same-sex

couples and their self-reported marital status. One limitation of using the ACS is that marital status for same-sex couples was not reported prior to 2012. This means that we are unable estimate the effect of early legalization.

We restrict our sample to couples and estimate the following equation:

$$\text{Married}_{iost} = \alpha + \sum_{\substack{m \neq 2014 \\ m=2012}}^{2019} \beta_m \left(\text{Obergefell}[t = m] \times \text{Same-Sex}_{iost}\right) + \text{Domestic Partnership}_{ost}$$

$$+\mathbf{X}_{iost} + \gamma_s + \delta_t + \nu_o$$

$$(6)$$

where Married_{iost} represents whether surveyed individual i of orientation ($o \in$ same-sex, different-sex), in state (s), in year (t) is married. Same-Sex_{iost} represents whether the individual belongs to a same-sex couple. $\text{Domestic Partnership}_{ost}$ is as defined in Equation 1.

We include a series of time-varying individual level controls ($\mathbf{X}_{st}$) including race, education, age, and income dummies. We use the same set of fixed effects as in Equation 1. The treatment variable $\text{Obergefell}[t = m]$ is an indicator that equals 1 if an observation is m years relative to 2015. The coefficients of interest β_m measures the changes in the probability that an individual belonging to same-sex couple reports being married as a result of the Obergefell v. Hodges ruling. Estimates are weighted by ACS weights and standard errors are clustered at the state level.

Estimates for Equation 6 are provided in **??**. The estimates provide suggestive evidence that Obergefell increased the proportion of married same-sex couples in both Obergefell states and early legalization states. However, these estimates must be interpreted with caution. We find significant evidence in pre-trends in both settings with little evidence of a discontinuity around 2015. The outcome variable now represents a stock variable rather than a flow variable and changes in the

proportion of same-sex couple who are married is not necessarily indicative of changes in marriage rates among same-sex couples. Lastly, the outcome variable in this specification is sensitive to the number of same-sex couples we observe in the ACS. Given that we expect the Obergefell ruling to also affect the number of same-sex couples, our estimates may be biased.

Without better data, we are unable to provide conclusive evidence of the effect of the Obergefell v. Hodges ruling on marriage rates among same-sex couples.

C.1 Figures

Figure C.1: Proportion of joint tax filers that are same-sex couples from Fisher et al. (2018)
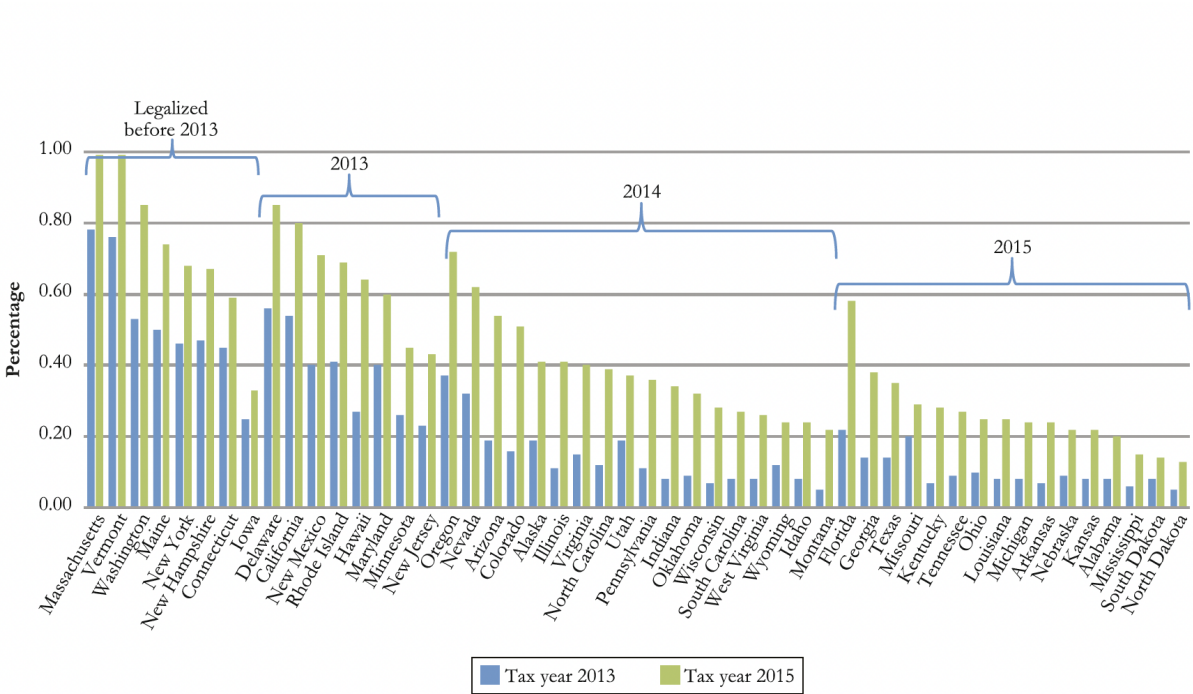
Appendix Figure C.1. Source: Fisher et al. (2018)
Notes: Figure 1 from Fisher et al. (2018). This figure depicts same-sex filers as a percentage of joint filers for the years 2013 and 2015.

Figure C.2: Estimates for Equation 6 using ACS data - The Effect of the Obergefell v. Hodges on the Probability that a Same-Sex Couple is Married Relative to a Different Sex Couple.
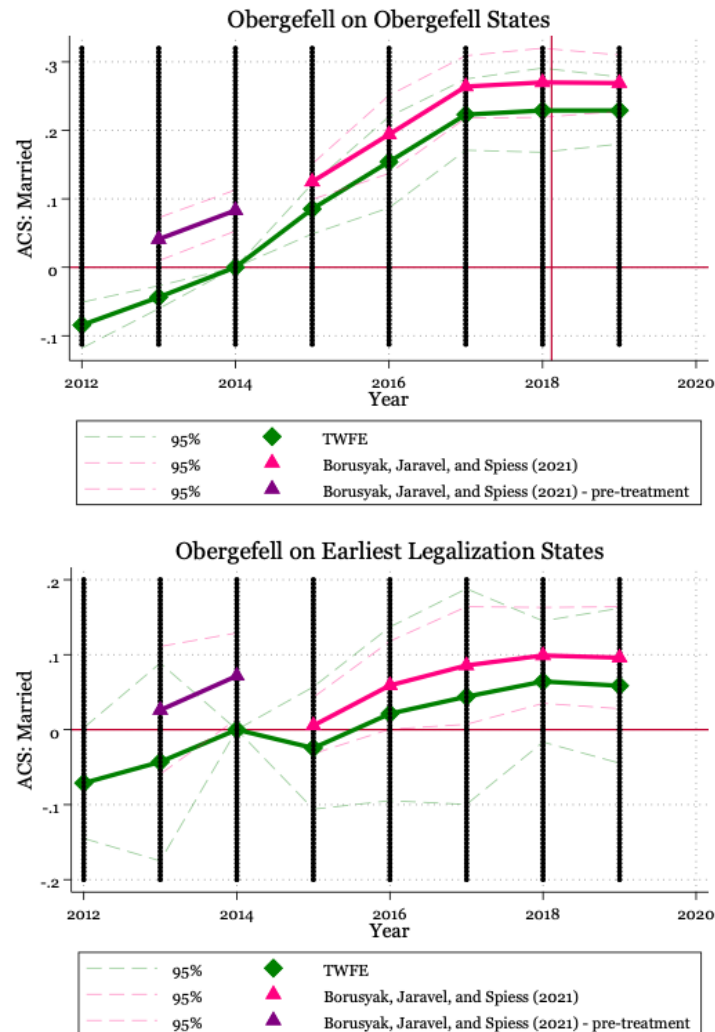
Appendix Figure C.2. Source: ACS (2008-2019)
Notes: The figure depicts the effect of the Obergefell v. Hodges ruling on the probability that a same-sex couple is married in Obergefell states and Earliest Legalization states. State categories are available in Table 1. The figures present estimates from Equation 6. Estimations include controls for race, education, age, and income. All estimates are weighted by ACS weights and standard errors are clustered at the state level.

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