Spousal Visa Policy and Mixed-Citizenship Couples: Evidence from *United States v. Windsor*

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Abstract

How does spousal visa access affect couple formation? I answer by exploiting a change in the federal government's definition of spouse: following *United States v. Windsor*, same-sex couples gained access to spousal visas. I estimate this causes a 36% increase in couples and a 72% increase in marriage rates for mixed-citizenship same-sex couples, accounting for aggregate changes in other same-sex and mixed-citizenship couples using a triple difference design. Transfers, insurance, or fraud do not explain the results. Informal calculations suggest that 1.5 million people have partners thanks to spousal visas. I also find suggestive evidence consistent with improved match quality.

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I Introduction

Partner choice is consequential; it has significant implications on labor force participation, the allocation of leisure and household resources, income inequality, and other family-level characteristics (Becker, 1974). I study spousal visa policy and its implications for couple formation and marriage, which directly affects well-being and can have downstream effects on labor supply. Well-being improves with couple formation and can depend on romantic partner choice (Stutzer and Frey, 2006; Zimmermann and Easterlin, 2006; Lee and Seshadri, 2019).

Love is not blind to policy, which can impact partner choice. For example, policy can incentivize certain couple types or prevent individuals from entering the marriage market. Spousal visa policy does both. It benefits mixed-citizenship couples, a citizen and a non-citizen, and authorizes non-residents to marry citizens. This paper studies the effect of spousal visa access on couple formation, marriage, and assortative mating by citizenship and birth country in the United States.

Policymakers debating immigration reform also deserve evidence on immigration policy. I contribute the first study of an extensive margin change in spousal visa access in the United States. Identifying spousal visa policy's impact requires policy variation. However, large-scale changes in spousal visa policy have not occurred for decades, in the United States. Earlier policy changes occurred when social norms regarding couple formation were substantively dissimilar, immigration patterns differed, and the data were sparser.

This paper leverages a change in the federal government's definition of a spouse. In 2013 the Supreme Court repealed the the Defense Of Marriage Act in *United States v. Windsor*. This expanded the federal government's definition of spouse and extended access to federal marriage benefits to same-sex couples. In this natural experiment, same-sex couples experience the treatment effect of spousal visa access. Although the newly treated group is small, spousal visa access can directly affect millions of mixed-citizenship couples and can affect everyone through the marriage market.

Similar studies leverage earlier immigration reform or international freedom of movement agreements. Jasso, Rosenzweig and Smith (2000) study the most recent comprehensive immi-

gration reform in the United States, the Immigration Reform and Control Act of 1986, which made spousal visa screening more stringent. This led to fewer mixed-citizenship marriages and, given other reforms, lower skill levels among spousal visa holders. Adda, Pinotti and Tura (2024) study European Union (EU) expansion, which gives citizens of its member states the right to work in any member state. The expansion reduces the marriage incentive for couples with an established EU citizen and a new EU expansion citizen. Consequently, the probability that a non-citizen marries a citizen decreases, and the divorce hazard increases. These papers show that spousal visas are a benefit, and removing or replacing that benefit reduces mixed-citizenship couples.

I ask subtly distinct questions. Does permitting mixed-citizenship marriage increase take-up? Does gaining spousal visa access increase mixed-citizenship couples formation? One might not expect soulmates to bend to policy. However, given the existing literature, one can expect spousal visa policy to change mixed-citizenship marriage rates. Indeed, raw data show the annual mixed-citizenship same-sex marriages jumped tenfold in 2013 (Figure 1a, on a logarithmic scale). Likewise, the stock of mixed-citizenship same-sex couples doubled from 2012 to 2017 (Figure 1b), a larger proportional increase than same-citizenship same-sex couples.

This paper analyzes the 2008 to 2019 American Community Survey (ACS) rounds, repeated cross-sections that sample 1% of the United States population each year. The ACS designates a "head-of-household" and lists their relationship with every household member. Possible relationships include "spouse" and "unmarried romantic partner." Therefore, cohabiting same-sex couples are observable. However, the sexual orientation of non-cohabiting individuals is unobservable. The ACS does not document dating behavior, so I define couple formation as when couples begin cohabiting.

I use a difference-in-differences-in-differences (DDD) design to identify the treatment-on-the-treated effect of the policy. The DDD design measures the increase in mixed-citizenship same-sex couples net of increases in other same-sex couples, to account for changes in attitudes and laws for all same-sex couples; and subtracts the difference in mixed-citizenship different-sex couples net of changes in other different-sex couples, to account for aggregate changes in immigration and

mixed-citizenship couple formation. Thus the DDD design isolates the effect of the policy change unique to mixed-citizenship same-sex couples.

The policy change increases the mixed-citizenship coupled rate by 36%, statistically significant at the 1% level. It also increases the mixed-citizenship marriage rate by 72%, which jumps up in 2013 and persists. The policy increases disassortative mating by citizenship by definition. It also increases disassortative mating by birth country by 11%.

The design is susceptible to double counting if individuals who would have been in same-citizenship couples are now in different-citizenship couples. I calculate that the worst case doubling counting would inflate the main effect from 33% to 36%, which is within one standard deviation of the estimate.

Robustness checks show the results are not driven by access to other federal benefits, health insurance, roommates relabeling as couples, or partners or couples moving across state lines. The results are also not explained by between-state variation in the timing of same-sex marriage legalization or population shares of non-citizens or illegally-present non-citizens.

Marriage fraud does not explain the results either. Proving *bona fide* marriage for immigration purposes is a demanding legal process. Immigration officers deny genuine couples who do not meet the normative standard of marriage for immigration purposes. Moreover, marriage fraud must be relatively more likely for same-sex couples to explain the result. A marriage fraudster would likely choose a different-sex partner given the social costs of revealing same-sex attraction, which tends to be higher abroad. I conduct additional empirical analyses to test this mechanism further and do not find supporting evidence.

This paper quantifies spousal visa policy's importance for couple formation, marriage, and assortative mating by citizenship and birth country. It contributes to literature on marriage and policy, which show marriage is sensitive to encouraging single mothers to work (Bitler et al., 2004; Francesconi and Klaauw, 2007), blood test requirements (Buckles, Guldi and Price, 2011), relative income (Watson and McLanahan, 2011), health insurance (Abramowitz, 2016; Barkowski and McLaughlin, 2022), and social insurance (Persson, 2020). This paper also contributes to our

understanding of what makes a partner attractive, both in the context of mixed-citizenship couples (Lafortune, 2013; Hoffmann and Velasco, 2023*a*,*b*) and same-sex couples (Jepsen and Jepsen, 2002; Ciscato, Galichon and Goussé, 2020).

This paper contributes to understanding expanding marriage rights in the United States. From *Loving v. Virginia* to *Obergefell v. Hodges*, landmark Supreme Court rulings expanded marriage rights, impacting the market for romantic partners. Previous research shows that legalizing interracial and same-sex marriage increased such marriages and led to beneficial outcomes (Fryer Jr, 2007; Gevrek, 2014; Carpenter, 2020; Carpenter et al., 2021; Badgett, Carpenter and Sansone, 2021). Friedberg and Isaac (2022) find federal tax changes following *United States v. Windsor* increased marriage rates, but generate deadweight loss from taxation (Isaac, 2023). This study furthers our understanding of Supreme Court rulings by examining indirect effects on the broader population through the marriage market channel.

I organize the paper as follows: Section II explains the institutional context and policy change. Section III describes the data. Section IV explains the research design, empirical model, and estimation procedure. Section V reports and discusses the results. Section VI concludes.

II Background

A Marriage and its Benefits

Marriage is a public commitment made by two partners. Laws regarding dividing assets upon divorce, alimony, child custody, and medical visitation rights form the legal *marriage contract* and are state-level laws. States determine marriage eligibility and the strength of the marriage contract.

Marital status matters for government taxes and transfers. In particular, "Single/never married" and "Married" are classifications that affect federal and state tax and transfer policies. These policies consider unmarried couples' incomes as separate individuals' incomes but consider the joint income of married couples. Therefore, couples can marry, divorce, and adjust their labor supply to optimize over tax and transfer benefits. Transfer programs include Medicaid, Supplemental Nutri-

tion Assistance Program, the Earned Income Tax Credit, and other means-tested programs. Social Security benefits can also depend on marriage due to surviving spouse benefits. Thus, state and federal governments offer benefits that depend on marital status.

The federal government determines eligibility for immigration and citizenship. Non-citizen spouses of citizens are eligible for: temporary visas while applying for permanent residency; permanent residency visas (Green Cards), conditional upon marriage for two initial years; and United States citizenship after three years of permanent residence instead of the usual five. These benefits enable mixed-citizenship couples to stay together when they cannot obtain or renew another visa. Spousal visas do not benefit same-citizenship couples. Hence, accessing spousal visas requires mixed-citizenship couple formation, unlike other benefits.

B Legality of Same-Sex Marriage

Attitudes towards and legality of same-sex marriage varied during the period of analysis. Some states offered marriage benefits, while others banned same-sex marriage, blocking access to state-level marriage benefits. In 2004, Massachusetts legalized same-sex marriage for its residents. California followed suit in 2008, including for non-residents. This spurred a rush in same-sex marriages (visible in Figure 1a). Couples traveled from around the country and world to get married in California[1]. In response, Massachusetts began offering same-sex marriage to non-residents in July 2008.

With states offering marriage to non-residents, same-sex couples all over the country could access the marriage contract. Couples residing in states without same-sex marriage would not get state-level benefits but could still access the marriage contract. For example, same-sex couples from Ohio that married in Massachusetts were not married for Ohio tax and transfer purposes. However, upon divorce, couples must divide their marital assets according to Massachusetts law (according to their marriage contracts).

[1] After Proposition 8 passed in November 2008, same-sex marriage became illegal in California. However, performed marriages remained lawful. California re-legalized same-sex marriage in 2013.

In 2015, the Supreme Court ruled in *Obergefell v. Hodges* that same-sex marriage is legal in all states. This required the remaining states to immediately legalize, perform, and recognize same-sex marriages.[2]

The Defense of Marriage Act (DOMA) banned federal recognition of same-sex marriages in 1996. Despite gaining access to the marriage contract in 2008 and access to state-level marriage benefits, DOMA blocked same-sex couples from accessing federal marriage benefits. On June 26, 2013, the Supreme Court ruled in *United States v. Windsor*, striking down the section of DOMA preventing the federal government from recognizing same-sex marriages. That day, the federal government ended a nearly two-decade policy of ignoring same-sex marriages and immediately gave full federal marriage benefits to same-sex couples. This paper uses the variation in access to federal marriage benefits for same-sex couples induced by the end of DOMA.

The Supreme Court is not elected and does not grant government benefits. The policy change resulted from a close decision made after years of litigation. Hence, this policy change is exogenous to short-term political sentiment or popular opinion trends.

Lastly, this policy change occurred after same-sex couples gained access to the marriage contract in 2008. All same-sex couples gain access to spousal visas because they can access the marriage contract by traveling to a state with legal same-sex marriage.

C Immigrant and Non-Immigrant Visas

Immigrant and non-immigrant visas to the United States serve different purposes and durations of stay. Immigrant visas are for those intending to live permanently in the United States, leading to Green Cards and potential citizenship, and include family-sponsored, employment-based, and diversity visas. For example, F1 (family-sponsored) and EB-1 (employment-based). On the other hand, non-immigrant visas are for temporary stays with specific purposes like tourism, business, study, or temporary work and have expiration dates. For example, B-2 (tourist), F-1 (student), and H-1B (specialty occupation work) (U.S. Department of State, 2024).

[2]Table A1 provides a timeline for same-sex marriage legalization.

The key distinction lies in the intent of permanent residency versus temporary stay. Since non-immigrant visas are for temporary stays, non-immigrant visa holders must not show an intent to stay in the country. For example, if non-immigrant visa holders marry United States permanent residents or citizens, then they *show intent* to remain in the United States. Therefore, non-immigrant visa holders must switch to spousal visas to stay in the United States upon marriage.

Under DOMA, spousal visas were not available to same-sex couples. So non-immigrant visa holders marrying citizens would violate their visa terms with no option to switch to spousal visas. Hence, non-immigrant visa holders were strongly discouraged from marrying same-sex partners before 2013, effectively barring them from same-sex marriage. After *United States v. Windsor*, non-citizens could marry a same-sex partner and expect to obtain immigrant status.

Local authorities provide marriage licenses that grant classification as married for most purposes. However, proving *bona fide* marriage for immigration purposes requires an extensive application and interview process. Immigration officers may, for example, check social media, quiz partners' knowledge of each other, and inspect shared living spaces. Couples benefit from lawyers' assistance during this process (Chetrit, 2011). This process exists to prevent marriage fraud. Marriages for the sole purpose of acquiring spousal visas are fraudulent. Marriage fraud risks deportation, jail time, and denaturalization (Smith and Elmilady, 2014).

To explain the empirical results, marriage fraud must disproportionately occur for same-sex couples compared to different-sex couples. It is unlikely that fraudulent marriages drive the results for three reasons. First, proving *bona fide* marriage for immigration purposes is a long, challenging process. The Immigration Marriage Fraud Amendments in 1986 made proving marriage for immigration purposes so demanding that the number of non-citizen men married to citizen women unambiguously declined (Jasso, Rosenzweig and Smith, 2000). Secondly, it is likely more difficult for same-sex couples to meet immigration officers' criteria (Carron, 2014). For example, public relationships publicly disclose sexual orientation. However, revealing same-sex attraction is potentially incredibly socially costly, especially for immigrants. Coming out of the closet in an attempt to get a visa is avoidable by committing marriage fraud with a different-sex partner. Furthermore,

for same-sex couples, filing taxes jointly was impossible in some states. This also makes proving marriage for immigration purposes relatively more challenging for same-sex couples.

III Data

A American Community Survey

I use repeated cross-sections of survey data from the 2008-2019 rounds of the US Census Bureau's American Community Survey (ACS), accessed via IPUMS (Steven Ruggles et al., 2020). Each year, the ACS surveys a new representative sample of 1% of households, collecting information on marriage, citizenship, transfer benefits, health insurance, and demographics. The ACS is the largest, most detailed data set that identifies same-sex couples in the US.

Each household designates one individual as the "head-of-household," typically the property owner or renter). All other household members then provide a "relationship to head"—for example, spouse, unmarried romantic partner, parent, child, tenant, roommate, etc. I restrict the sample to heads-of-household and their spouses or unmarried romantic partners.

Couples are "same-sex" if partners are both female or both male. Couples are "different-sex" if one is female and the other male. To observe couples in the survey, they must live together (cohabit), and one partner must be the head-of-household. Therefore, this study does not include non-cohabiting or non-head-of-household couples. Likewise, single individuals' sexual and romantic preferences are unobserved, so they are not in the sample.

Data on same-sex couples are unreliable before 2008 due to coding practices (Chesnut, 2008; O'Connell et al., 2010). To address data quality, I do not use surveys before 2008, and I drop individuals with imputed sex and relationship to head.

Before 2013, same-sex married couples were recoded as unmarried romantic partners. Only 2012 has a data quality flag to identify recoded couples. Therefore, to understand the stock of couples and couple formation rates, I pool married and unmarried couples and order them by survey year. To understand entry into marriage and marriage rates, I restrict to married couples from the

2012-2019 surveys only and order them by marriage year. I keep couples married between 2008 and 2019 to match the years in the principal analysis. Notice that this selects on marriage duration. Couples married before 2013 have marriage durations of 0-12 years and can appear in all eight surveys. However, couples married after 2013 have marriage durations of 0-6 years and appear in fewer surveys.

Couples are "mixed-citizenship" if one partner is a citizen and the other is a non-citizen. Couples are "same-citizenship" if they are both citizens or both non-citizens. When ordered by survey years, citizenship is determined directly from the survey response. When ordered by marriage years, citizenship reflects the status at the time of marriage. For those who naturalize after marriage, I recode them as non-citizens for the marriage analyses.

ACS respondents report being citizens at higher rates than in administrative records (Van Hook and Bachmeier, 2013; Brown et al., 2019). Van Hook and Bachmeier (2013) use survey and administrative data on annual naturalizations. They find that the number of naturalizations in survey data exceeds those in administrative data. They recommend relabeling naturalized citizens who arrived in the past five years as non-citizens. Brown et al. (2019) link individuals from the ACS to Social Security Administration data. They find misreporting citizenship is more likely for non-relatives of the head-of-household. They point out that naturalizations can take longer to appear in administrative data. To address data quality, I drop individuals with imputed citizenship. In a robustness check, I relabel naturalized citizens who arrived in the past five years as non-citizens.

Lastly, I restrict the sample to couples with at least one partner aged 18 or older and 64 or younger. I restrict age because minors typically require parents' consent to marry and because the value of partnering for older couples is more likely related to health and retirement decisions and less likely related to the labor market or fertility decisions. However, restricting both partners' ages would disproportionately drop same-sex couples because they have more considerable age differences.

B Summary Statistics

Table 1 reports weighted individual-level summary statistics for mixed-citizenship same-sex couples (MSS), same-citizenship (not mixed) same-sex couples (NSS), mixed-citizen different-sex couples (MDS), and same-citizenship different-sex couples (NDS), pooled across survey years 2008-2019. The weights make the sample representative of the population for each survey year. MSS couples are more likely to be married (0.53 compared to 0.33), more likely to be male (0.66 to 0.47), and less likely to have transfer benefits (0.14 to 0.20) than NSS couples. While MSS couples are slightly less likely to have any health insurance than NSS couples (0.91 to 0.95), MSS couples are much more likely to have any health insurance than MDS couples (0.91 to 0.84). These summary statistics do not suggest that federal transfer benefits or access to health insurance are likely to explain differential mixed-citizenship or same-sex couple formation patterns.[3]

C Couple Counts

I employ a triple difference regression design to identify the policy's effect on changes in mixed-citizenship same-sex couples net of other mixed-citizenship and same-sex couple changes. This design is not defined at the individual level because individual preferences over partner sex are unobserved. Therefore, I aggregate the data from individuals up to state-years.

I create four groups of couples (MSS, NSS, MDS, NDS) and assign each (weighted) individual to one group. Then to create counts, I sum over individuals within group-state-years. The counts are representative of each group's population within a given state-year.

Figure 1b shows the number of individuals in each couple type on a logarithmic scale from the 2008 survey until the 2019 survey. Notably, the number of individuals in different-sex relationships remains stable while the number of individuals in same-sex relationships increases. For MSS couples, the number triples from 2012 to 2017.

Figure 1a shows the number of married individuals in each couple type, plotted by their year of marriage, observed in the 2019 survey. While the number of married different-sex couples remains

[3]Tables A2, A3, and A4 provide summary statistics for additional variables and for married couples only.

relatively stable, the number of married same-sex couples increases substantially. The number of individuals in NSS marriages and MSS marriages increases tenfold virtually overnight in 2013 for MSS marriages. There is also a jump in NSS marriages in 2008 because California legalized same-sex marriage, and couples rushed from all over the country to marry.

Lastly, these groups are the intersections of two pairs of disjoint sets of couples: same-/different-sex and mixed-/same-citizenship. I also group couples by another couple-level binary variable for robustness checks—for example, an indicator for receipt of a federal transfer benefit, health insurance type, or moving within the past year.

IV Method

Ideal data to estimate the effect of spousal visa access on couple formation and marriage rates would include respondents' sexual orientation. The coupled rate for a given couple type is the number of individuals y_{gst} in couple type g, in state s, and year y divided by the relevant subpopulation pop_{gst}. The relevant subpopulation for same-sex couple types (MSS, NSS) is the population of same-sex attracted individuals ($y_{MSS,st} + y_{NSS,st} +$ same-sex attracted singles). Similarly, for different-sex couples. $\ln(\frac{y_{gst}}{pop_{gst}})$ is the ideal outcome variable to measure percentage changes in rates.

I employ a difference-in-differences-in-differences design to identify the policy's average treatment-on-the-treated (ATT) effect. The DDD design removes selection bias from aggregate same-sex coupled rates and aggregate mixed-citizenship coupled rates. NSS and MDS coupled rates create a counterfactual MSS coupled rate, which the design removes, leaving variation specific to MSS couples alone. The design uses indicator variables for post-treatment $post_t$, mixed-citizenship M_g, same-sex SS_g, and group-state fixed effects σ_{gs} and year fixed effects τ_t.

Start with the ideal regression model. Notice that fixed-effects σ_{gs} and τ_t absorb the subpopu-

lations pop_{gst} when they have common growth rates:

$$\text{(1)} \qquad \ln(\frac{y_{gst}}{pop_{gst}}) = \beta_0 M_g \times post_t + \beta_1 SS_g \times post_t + \beta_2 M_g \times SS_g \times post_t + \sigma_{gs} + \tau_t + \epsilon_{gst},$$

$$\text{(2)} \qquad \ln(y_{gst}) = \beta_0 M_g \times post_t + \beta_1 SS_g \times post_t + \beta_2 M_g \times SS_g \times post_t + \tilde{\sigma}_{gs} + \tilde{\tau}_t + \epsilon_{gst}.$$

Where ϵ_{gst} are standard errors clustered at the group-state level. σ_{gs} and τ_t subsume the intercept and indicator variables post_t, M_g, SS_g, and $\text{M}_g \times \text{SS}_g$. $\tilde{\sigma}_{gs}$ and $\tilde{\tau}_t$ additionally subsume $pop_{gst} = pop_{gs} growth\_rate_t$.

I cannot estimate Equation (1) because the sexual orientation of singles is unobserved. Likewise, I cannot estimate Equation (2) and maintain a balanced panel because $\ln(y_{gst})$ is not defined when $y_{gst} = 0$, which is frequent for MSS couples in small states. To handle this, I consider the log conditional mean function $\ln E[y_{gst}|\mathbf{x}_{gst}]$ instead of the conditional mean of the log: $E[\ln y_{gst}|\mathbf{x}_{gst}]$, as in Equation (2). ($\mathbf{x}_{gst}$ are the right-hand side variables.) Bringing the logarithm operator outside the expectation is a Poisson model, which is not mathematically equivalent. However, Poisson is conceptually similar and better suited to count data than OLS (Wooldridge, 2001). Instead of estimating the ATT in logs, I estimate the ATT in levels expressed as a percentage of the control mean (Chen and Roth, 2024). This preserves the rate interpretation because the relevant subpopulations pop_{gst} still cancel out in the ratio. [4]

The Poisson model has three advantages. First, it avoids transformations, like $\ln(y + 1)$, that are not readily interpretable (Wooldridge, 2001) and can yield incorrect estimates (Chen and Roth, 2024). Second, it maintains a balanced panel and representativeness for all states. This avoids restricting the sample to large states or complicating interpretation. Both unbalanced panels and covariates can complicate interpretation (Borusyak, Jaravel and Spiess, 2024; Ghanem, Sant'Anna

[4]Chen and Roth (2024) express treatment effects as a percent change using potential outcomes notation, $TE = (y(1) - y(0))/y(0)$. Assuming the policy change does not impact sexual orientation, then $TE = (y(1)/pop - y(0)/pop)/(y(0)/pop)$.

and Wüthrich, 2024). Third, parallel pre-trends likely hold in percent changes but not in levels. Hence, this functional form is useful for identification, which I discuss below.

I estimate a Conditional Fixed Effects Poisson regression model of Hausman, Hall and Griliches (1984) by Quasi-Maximum Likelihood to identify the effect of access to spousal visas on coupled and marriage rates, as follows:

$$\begin{aligned}\ln E[y_{gst}|\mathbf{x}_{gst}] =&\beta_0 M_g \times post_t + \beta_1 SS_g \times post_t + \beta_2 M_g \times SS_g \times post_t \\ &+\sigma_{gs} + \tau_t.\end{aligned} \tag{3}$$

Equation (3) is this paper's primary regression model. β_2 is the coefficient of interest. It is the DDD estimator for the ATT. $\exp(\beta_2)$ is the incidence rate ratio (IRR) of the increase in the MSS-coupled rate relative to the increase in the NSS-coupled rate, net of the same ratio for different-sex-coupled rates.

The Conditional Fixed Effects Poisson model partials out the dimension of fixed effects that grow arbitrarily large. So σ_{gs} are not estimated. τ_t are finitely many fixed effects, not partialled out.[5]

I estimate the model using quasi-maximum likelihood. Therefore, estimates are consistent, assuming the mean of the dependent variable is correctly specified (Gourieroux, Monfort and Trognon, 1984; Wooldridge, 1999). That is, Quasi-Maximum Likelihood Estimation (QMLE) for Poisson regression does not assume the mean and variance are equal[6]. Instead, Quasi-MLE computes the variance/covariance matrix using the outer product of the gradient vector—the Hessian. These QMLE robust standard errors do not assume a Poisson distribution, are robust to arbitrary patterns of serial correlation (Wooldridge, 1999), and are, therefore, not subject to the issues explained by Bertrand, Duflo and Mullainathan (2004) concerning difference-in-differences inference. I clus-

[5]The estimation procedure requires post_t in the model to maintain convexity. I include post_t in the model and some τ_t with $t \geq 2013$ automatically drops out. It does not matter which post-period year fixed effect τ_t drops out; the results are identical.

[6]The Poisson probability distribution has the property of equal mean and variance, and the generic MLE Poisson regression assumes this.

ter the standard errors at the group-state level in all specifications.

I test if the model correctly specifies the mean of the dependent variable with a RESET test (Ramsey, 1969; Wooldridge, 2001). This test adds the square and cube of the fitted values from Equation (3) into the regression. Specifically, I estimate:

$$\begin{aligned}\ln E[y_{gst}|\mathbf{x}_{gst}] =& \beta_0 M_g \times post_t + \beta_1 SS_g \times post_t + \beta_2 M_g \times SS_g \times post_t \\ &+ \sigma_{gs} + \tau_t + \psi_1 \ln^2(\hat{y}_{gst}) + \psi_2 \ln^3(\hat{y}_{gst}).\end{aligned} \tag{4}$$

Then test that $\psi_1 = \psi_2 = 0$. I report these χ^2-statistics and their p-values.

The DDD design assumes the groups have parallel pre-trends.[7] Conceptually, Ghanem, Sant'Anna and Wüthrich (2024) show that non-separable models' pre-trends are parallel when the conditional means of the demeaned untreated potential outcome are stable across time. Formally, $E[Y_{gs,t=pre}(0) - E[Y_{gs,t=pre}(0)]|\sigma_{gs}] = E[Y_{gs,t=post}(0) - E[Y_{gs,t=post}(0)]|\sigma_{gs}]$, for a fixed $g \in \{$MSS, NSS, MDS, NDS$\}$. Hence, I assume the unobserved components of potential coupled or marriage rates are equal in conditional expectation in each period.

I estimate a DDD event study specification to test the parallel pre-trends assumption (Wooldridge, 2023; Chen and Roth, 2024). The DDD event study also provides insight into how the effects evolve over time. Specifically, I estimate the following:

$$\begin{aligned}\ln E[y_{gst}|\mathbf{x}_{gst}] =& \sum_{k=2008}^{2019} \delta_k M_g \times 1\{t = k\}_t \\ &+ \sum_{k=2008}^{2019} \gamma_k SS_g \times 1\{t = k\}_t \\ &+ \sum_{k=2008}^{2019} \beta_k M_g \times SS_g \times 1\{t = k\}_t + \sigma_{gs} + \tau_t,\end{aligned} \tag{5}$$

[7] Specifically, I assume parallel pre-trends in log counts. Parallel pre-trends are unlikely to hold under any arbitrary monotonic transformation (Roth and Sant'Anna, 2023). The Poisson model is ideal for count data, and the RESET test fails to reject that the model is correctly specified.

where β_{2012}, γ_{2012}, δ_{2012}, τ_{2012} are omitted, then test that

$$\beta_{2008} = \beta_{2009} = \beta_{2010} = \beta_{2011} = 0. \tag{6}$$

The pre-trends test yields a χ^2-statistic for Poisson regression. I report the test statistics and their p-values.

A Marriage Specification

I estimate Equation 3 for couples married between 2008 and 2019 and surveyed between 2012 and 2019. As mentioned above, Census recoding practices prevent observing same-sex couples' marriage years before 2012. So this sample selects on marriage duration. Instead of Survey Year, t represents Marriage Year.

Ordering couples by their marriage year (omitting unmarried couples) instead of the survey year is valuable for two reasons. First, the marriage year estimates identify the effect of spousal visa policy on marriage rates: marriages per person per year. Second, they represent a *flow* into marriage. Whereas the survey year estimates capture changes in the *stock* of couples. The DDD event study estimates from the marriage specification, therefore, inform whether the relative flow into mixed-citizen same-sex couples is temporary or persistent, which is crucial for understanding the policy.

B Robustness

I include covariates in both the main specification, described by Equation (3), and the DDD event study, described by Equation (5). Including covariates provides suggestive evidence about the channels through which the policy can operate. I choose covariates that can plausibly mediate the effect of federal marriage recognition. Specifically, group-state-year population shares for couples with transfer benefits (food stamps, welfare, Social Security, and Supplemental Security Income), with health insurance (employer, private, public, purchased, other), that recently jointly moved

(from abroad, between states, within state), where one partner recently moved (from abroad, between states, within state), and where a partner is a recent arrival or born in China, India, Mexico, or the Philippines. I also choose state-year demographic covariates that are plausible confounders: individual population shares for male, white, Hispanic, black, non-citizen, naturalized, student, active-duty military, welfare or foodstamp receipt, and age categories (18-24, 25-34, 35-44, 45-54, 55-64, $\geq$65); and the proportion of unmarried different-sex cohabiting couples.

Covariates, however, complicate and change the interpretation. Without covariates, β_2 is the total effect of access to federal marriage recognition. With covariates, β_2 is the effect of access to federal marriage benefits conditional on the covariates. If the covariates are mediators, this is the effect that does not operate through the channel represented by the covariates. However, these covariates could be the outcome of the policy and, therefore, induce selection bias. Even without selection bias, the covariates restrict the interpretation of β_2. β_2 is the ATT for the subgroups that do not experience changes in the covariates (Ghanem, Sant'Anna and Wüthrich, 2024). Given the restricted interpretation and possible selection bias, the model without covariates is the primary specification of interest.

I also directly test that federal marriage benefits affect coupled rates through channels other than spousal visa policy. Instead of using a mixed-citizen indicator variable M_g, I change the specification to measure relative increases in same-sex couples with a different attribute A_g. If the policy change causes couples to form to access a specific benefit, then this specification measures that directly:

$$\begin{aligned}\ln E[y_{gst}|\mathbf{x}_{gst}] =& \beta_0 A_g \times post_t + \beta_1 SS_g \times post_t + \beta_2 A_g \times SS_g \times post_t \\ &+ \sigma_{gs} + \tau_t.\end{aligned} \tag{7}$$

For heterogeneity analyses, I split the sample and run separate regressions. For state-level heterogeneity, I leave years unchanged. However, I split the individual-level data within state-years for birth country, age, and gender heterogeneity. This increases the number of zeros and decreases

precision. To increase precision, I combine years for these individual-level splits. 2008 and 2019 are unchanged; however, I combine these pairs: 2009/2010, 2011/2012, 2013/2014, 2015/2016, and 2017/2018.

It is not interesting to consider same-citizenship couples for heterogeneity by birth country because they are virtually all born in the United States. Therefore, I estimate Equation (7) but restrict the sample to individuals in mixed-citizenship couples only. In this case, A_g indicates a characteristic of the non-citizen's birth country.

V Results & Discussion

A Main Results

Table 2 reports the estimated model described by Equation (3). The triple interaction is the coefficient of interest, the difference-in-differences-in-differences, and exponentiating it gives the Relative IRR reported at the bottom of the table. The Relative IRR is the average treatment effect of spousal visa policy for the mixed-citizenship same-sex coupled rate. The first column reports that the share of same-sex attracted individuals in mixed-citizenship couples increases 30.4 log points. The relative IRR is 1.355 with a standard error of 0.072. This represents a 35.5% increase in the mixed-citizenship same-sex coupled rate for same-sex attracted individuals, statistically significant at the 1% level.

The table also reports statistics and p-values for a RESET misspecification test and a parallel pre-trend test, described by Equations (5) and (4). The χ^2-statistic for the RESET test, described by Equation (4), is 2.764, which fails to reject the assumption of a correctly specified mean. The χ^2-statistic for the pre-trends test, described by Equation (6), is 3.174, which fails to reject the assumption of parallel pre-trends.

Each column corresponds to a different set of covariates. The first column has none, and subsequent columns contain a set of covariates indicated by an X. As discussed above, the primary specification of interest includes no covariates because covariates can induce bias and restrict the

interpretation of the ATT to a subset of the treated sample. The subsequent columns with covariates provide suggestive evidence regarding channels other than spousal visa access. If these covariates mediate the effect of spousal visa access, their inclusion will attenuate the coefficient of interest. Since the main estimates do not become insignificant, these alternative channels likely do not explain the results. I further test and discuss alternative channels below.

Figure 2 plots the DDD event study estimates, described by Equation (5). Figure 2a depicts the coupled rate estimates. They appear stable in the pre-period and trend upwards in the post-period. The steady increase in the MSS coupled rate indicates higher net couple formation. Higher net couple formation can result from decreased dissolution or increased formation. Hence, this result suggests fewer marginal dissolutions resulting from immigration policy or greater marginal formations resulting from the higher value of MSS couple formation. The higher formation is consistent with the slow increase in couples because deciding to move in together is a long process, which is unlikely to adjust to the policy change immediately. Conversely, marriage fraudsters seeking visas rather than companionship would move in immediately to quickly demonstrate false commitment and access visas sooner. Contrary to the results, that would appear as a jump in the coupled rate.

Table 3 reports the estimated model described by Equation (3), where year represents the year of marrying. Access to spousal visa policy causes the annual mixed-citizenship same-sex marriage rate to increase by 54.0 log points. The relative IRR is 1.716 with a standard error of 0.307, which represents a 71.6% increase in mixed-citizenship same-sex marriages annually, statistically significant at the 5% level. The χ^2 statistic for the RESET test is 3.167, which fails to reject the assumption of a correctly specified mean. The χ^2 statistic for the pre-trends test is 0.457, which fails to reject the assumption of parallel pre-trends.

The subsequent columns with covariates have a slightly different interpretation. In Tables 2 and 3, the covariates represent the number of couples with those attributes. If couples with specific attributes drive couple formation or marriage, then we would expect the estimated effect to decrease, which does not occur. If those attributes predict couple formation or marriage, their inclusion can

create more precise estimates. However, the results can overstate the policy effect if marriages cause or permit couples to gain specific attributes. Table **??** shows that including same-sex couple covariates increases the estimated effect, suggesting they predict or result from marriage.

Figure 2b plots the DDD event study estimates for the marriage rate. The 2008 estimate is off-trend because a disproportionate number of same-citizenship same-sex marriages occurred when California legalized same-sex marriage that summer. In 2013, the estimates jump to a permanently higher level, which is consistent with non-permanent residents gaining the right to marry a same-sex partner without visa penalties.

A caveat to consider while interpreting the results is double counting. Suppose every citizen partner of a new MSS couple would have had a citizen partner who is now partnerless. Then, the number of NSS couples decreases by precisely the number of MSS couples. The converse is also possible. Suppose each citizen partner of a new MSS couple would have been single, and citizens who previously would have a non-citizen partner must find a citizen partner. Then, the number of NSS couples increases by precisely the number of MSS couples. A back-of-the-envelope calculation[8] suggests that these extreme cases of reallocation in the market for romantic partners could over- or under-estimate the actual effect by 7%. For the coupled rate, double counting could inflate it from 33% or deflate it from 38%, which are within one standard error from the estimated effect. I also test for possible double counting by estimating a difference-in-differences specification with mixed-citizenship couples only because switching between same-sex and different-sex partners is unlikely. This yields an estimate of 95.5% (Table A25), likely due to contemporaneous increases in same-sex couples. I also re-estimate the main specification restricting to non-citizens only. Since a similar number of MSS- and NSS-coupled individuals are non-citizens, if double counting occurs, the estimated effect should be substantially larger in this restricted sample. However, the estimate is quite similar at 37.4% (Table A25). These results do not indicate that double counting

[8] If the groups have equal size, then double-counting could double or halve the estimates. However, the groups have different sizes. In Table 1, there are $9,034$ MSS-coupled individuals and $149,138$ NSS-coupled individuals. If there are 35.5% more MSS-coupled individuals (Table 2) in the post-period than the pre-period, then there could be $1.355/(1+1.355) \times 9,034 = 5,197$ fewer NSS-coupled individuals. That corresponds to approximately $5,197/(149,138/2) = 6.97\%$ fewer NSS-coupled individuals in the post-period. Accounting for this would yield an estimate of 33.03%. Conversely, if the market reallocates partners oppositely, the estimate would become 37.97%.

overestimates the effect sizes.

B Alternative Explanations

The DDD design accounts for aggregate changes in same-sex and mixed-citizenship couples. A credible explanation for the results must explain why mixed-citizenship same-sex couples are differentially affected. Few other explanations offer a credible justification for the differential treatment effect of MSS couples, and I find no evidence to support them.

I initially test the credibility of alternative channels by including covariates in the main specification described above and find no evidence for alternative channels. Moreover, I estimate the policy's effect on different types of couples, as Equation (7) describes. The idea is simple: if another characteristic is more important than citizenship, then splitting on that characteristic will also yield significant results. For example, if couples are forming for a benefit, then the share of couples with that benefit will increase. Table 4 reports these estimates.[9]

1 Transfer Benefits and Health Insurance

Other federal transfer benefits and health insurance incentivize couples to form and marry. However, including the share of couples with transfer benefits (Column 2) or health insurance (Column 3) in Table 2 does not statistically significantly change the coefficients of interest. These incentives likely matter less for MSS couples because they are positively selected, as shown in Table 1, which is not unexpected because same-sex couples, in general, are positively selected, especially on education (Black, Sanders and Taylor, 2007; Badgett, Carpenter and Sansone, 2021). The first two columns in Table 4 show no differential increase between same-sex couples receiving transfers and those not receiving transfers, and similarly for health insurance. If couples were forming to access transfers or health insurance, then one would expect these estimates to be positive and statistically significant. While both estimates are statistically insignificant, the estimate for any transfer is neg-

[9]The appendix contains additional disaggregated estimates for transfer benefits (Table A9), health insurance (Table A10), both partners moving (Table A11), one partner moving (Table A12), and heterogeneity by non-citizens' birth countries (Table A13).

ative. The estimate for health insurance is positive, and if mixed-citizenship couples form to access health insurance, it is large enough to spill over and explain the main effect. However, the positive estimate is also consistent with increases in same-sex marriage and health insurance for unmarried same-sex couples (Carpenter, Harrell and Hegland, 2023).

2 Moving Across State Lines

Same-sex couples or attracted individuals might move between states to access state-level marriage benefits. For example, if people moved from Florida, Ohio, or Texas (large, late-legalizing states) to Vermont, DC, or Hawai'i (smaller, early-legalizing states) to access same-sex marriage, then the estimates would be biased upward by these spillovers. In Column 4 in Table 2, I include the share of coupled individuals who moved within the past year as covariates in the main regression specification. Moves are within a state, between states, and from abroad. Including these covariates does not statistically significantly change the coefficient of interest.

To test for spillovers directly, I estimate the share of same-sex couples that jointly moved between states in the past year and where precisely one partner moved between states in the past year. The last two columns of Table 4 report these results and indicate no differential same-sex coupled rate by joint or one-partner moves across state lines within the past year. Both estimates are statistically insignificant. For joint moves, the estimate is a precise zero. For one partner moves, the estimate is positive but not large enough to create meaningful spillovers into the main effect.

3 Same-Sex Marriage Legalization

Same-sex marriage legalization increases the number of same-sex marriages (Dillender, 2014; Carpenter, 2020; Carpenter et al., 2021). Despite differencing out changes that happen for same-citizenship same-sex couples, does variation in the timing of same-sex marriage legalization differentially affect mixed-citizenship couples? Many states legalized same-sex marriage in 2013, including California's re-legalization. Omitting California does not change the results (Table A14). Likewise, results for early ($\leq$2012) and late (2015) legalization states are statistically similar to

each other and the main effect (Table A15). I refer to Hansen, Martell and Roncolato (2020); National Center for Lesbian Rights (2018) for state-level same-sex marriage legalization dates.

4 Deferred Action for Childhood Arrivals

Contemporaneous changes to immigration policy, including the Deferred Action for Childhood Arrivals (DACA), made it easier for illegally present immigrants to adjust their immigration status. For non-residents, marrying a citizen requires an immigration status adjustment. However, there is little state-level heterogeneity by the non-citizen population share or by the illegally-present-immigrant non-citizen share (Table A15). (Estimates for illegally-present immigrant numbers are from Capps et al. (2020).) Thus, illegally present immigrants do not account for the results.

5 Stigma

One limitation is the unobserved stigma against same-sex couples, which fell during the study period. Stigma could lead to closeted cohabiting couples differentially responding as "roommates" in earlier years. However, the absolute change in unmarried same-sex two-roommate households cannot account for the main effect (Figure A1). Estimating Equation (3) on unmarried individuals in two-roommate households shows a slight upward trend in MSS roommates (Table A16)—the opposite of what could account for the main effect. Similarly, same-sex couples with additional adults in the household are not more likely to form after the policy change (Table A17). Lastly, if genuine couples previously misreported themselves as roommates and later truthfully reported themselves as romantic partners, moving (within-state) should not increase. However, consistent with couple formation, same-sex couples are more likely to move within-state after the policy change (Tables A11 and A12).

C Mechanism

When non-permanent residents gain access to marriage, they marry their citizen partners. In response, the MSS marriage rate immediately jumps in Figure 2b. After the policy change, visa

status no longer prevents marriages, and marriage now offers visa benefits. MSS couples are relatively more attractive and less likely to dissolve under immigration pressure. Individuals date and eventually move in together; this shows up as the slow increase in the coupled rate in Figure 2a. If immigration pressures dissolve numerous MSS couples per year, removing that pressure could lead to a jump in the coupled rate. However, that does not appear to happen. This increase in MSS couples then sustains the higher MSS marriage rate. If the marriage rate were purely due to pre-existing couples marrying, that relative rate would fall back to zero. Thus, the policy creates a permanently higher marriage rate.

Additional empirical evidence is consistent with the increase in MSS couple formation. Same-sex couples are more likely to move within-state after the policy change (Tables A11 and A12), presumably to be together or start a family. Likewise, the effects for younger individuals are double those for older individuals (Table A18), likely because younger people are more actively seeking a relationship.

When I restrict the sample of non-citizens to those who arrived before the policy change, I find a larger increase in marriage rates, consistent with pre-existing couples gaining access to marriage (Table A19). The coupled rate increase is more modest, consistent with non-citizens having a partner already or facing higher search costs and forgoing a partner.

1 Fraud

Net MSS couple forming increased because the relative net benefits of MSS pairings increased. Did the policy change create more MSS couples that form long, loving relationships, or are these couples cohabiting and marrying merely to access spousal visas? Marrying merely for visas constitutes visa fraud, as described in section C. When the policy changes, both spousal visas and same-sex marriage legalization are salient. For example, there are TV shows and movies about spousal visas, and same-sex marriage is a hot political topic. *United States v. Windsor* makes headlines, and marriage fraudsters have a new option. Couples who merely want spousal visas can move in together to convince immigration officers that marriages are *bona fide*, which would create

a jump in the MSS coupled rate. However, there is no jump in the coupled rate, suggesting couples are not merely forming to access spousal visas.

I consider additional empirical evidence to probe for marriage fraud. First, I consider heterogeneity by non-citizens' birth countries. Specifically, I test four country characteristics that could make marriage fraud relatively attractive: illegal same-sex marriage, illegal same-sex attraction, low income, and constraining visa caps that delay immigration. These first three attributes incentivize people to leave, while the last creates an incentive to find a new immigration pathway. I estimate Equation (7) with mixed-citizenship couples only, where A represents one of the four country attributes. None of the estimates are statistically significant at the 5% level (Table A13). The magnitudes suggest new MSS-coupled non-citizens are 19% more likely from a country facing visa caps but 39% more likely from a country with legal homosexuality. If MSS couples form for fraudulent reasons, these two results are at odds. Non-citizens facing illegal homosexuality at home and visa caps in the United States have the strongest incentive for same-sex marriage fraud. The results are consistent with a high supply of non-citizens facing visa caps and high demand, or affinity, for non-citizens from countries with legal homosexuality. Specifically, visa caps bind when immigration is frequent; this is true for China, India, Mexico, and the Philippines. However, non-citizen same-sex spouses are disproportionately unlikely to be born in one of these countries, apart from the Philippines (Table A5). Controlling for the share of non-citizen partners born in these birth countries does not change the outcome in the primary specification (Table 2). The general increase in MSS-coupled individuals dwarfs the gain from these four countries.

Second, I re-estimate the main specification, Equation 3, restricting non-citizens to those who arrived before 2013 (Table A19). They did not move to the United States seeking a spousal visa with a same-sex spouse because it was not possible. Nevertheless, the MSS marriage rate for pre-2013 arrivals jumped by 86.5%, higher than the overall estimate. This is consistent with pre-existing couples marrying once they can. I also re-estimate the main specification restriction to non-citizens who arrived in the past three years (Table A20). These non-citizens are less likely to have permanent residency and, therefore, be more likely to benefit from a spousal visa. The

MSS marriage rate for non-citizens who arrived in the past three years increases by 61% but is not statistically significant. This smaller effect suggests that the non-citizens who had more time to date and form couples are driving the increase in marriages, rather than non-citizens who are more likely to lack permanent residency.

The MSS-coupled rate for pre-2013 arrivals increased by 13.8%, lower than the primary estimate (Table A19). This is consistent with newer arrivals forming a larger share of the recently formed couples and is compatible with both mechanisms of loving relationships and marriage fraud. The MSS-coupled rate for recent arrivals is 147% (Table A20), and parallel pre-trends do not hold. This suggests that recently arrived non-citizens are increasingly open to forming same-sex couples. If fraud drives the increase in couples, it should carry through to the marriage results because marriage is necessary for the visa. However, since the marriage estimates are smaller for post-2013 and recent arrivals, these results are inconsistent with marriage fraud driving the results.

Third, non-citizens without visas may seek spousal visas to gain legal status. I re-estimate the main specification, Equation 3, splitting states by their share of illegally present non-citizens. I do not find evidence of heterogeneity (Table A15). This is inconsistent with marriage fraud among undocumented non-citizens.

2 Mail-Order Spouses

Instead of meeting non-citizens through conventional means, are citizens importing spouses? If so, the relative number of non-citizen partners who lived abroad in the past year should increase. However, it does not significantly increase (Table A12). This suggests that "mail order" spouses are not a meaningful channel for spousal visas to increase couple formation and marriage.

3 Couples Living in Exile

The Netherlands, Belgium, and Canada were the first countries to legalize same-sex marriage, more than ten years before *United States v. Windsor*. Several other European and Latin American countries also legalized same-sex marriage before 2013. After the policy change, did MSS couples

who lived abroad move to the United States? If so, there should be an increase in MSS couples who jointly lived abroad in the past year. The relative incidence of same-sex couples who lived abroad in the past year increases by 22.3% (Table A11). However, this increase is off a mean close to zero percent (Table A2); it is statistically insignificant and fails the parallel pre-trends test. These results are consistent with some same-sex couples in exile repatriating after the legalization of same-sex marriage. However, there are too few of them to drive the main results.

4 Couples Living Apart

Partners meet and date before moving in together. So moving in could reflect an increased relative incidence of MSS dating or MSS couples that "live apart" deciding to live together. I do not observe when couples meet or how long they have dated. Therefore, I cannot distinguish between these two channels. However, couples previously living apart likely do not account for the total effect for two reasons. First, Carpenter and Gates (2008) estimate that $10 - 11\%$ of gay men and lesbian women have a same-sex partner but do not live together. Suppose this proportion is similar for MSS and NSS couples; only MSS couples living apart moved in together. In that case, that accounts for a third of the increase. Second, suppose MSS couples decide living apart is no longer worth it (maybe because a spousal visa gives them the flexibility to move or because living together is an implicit condition for a spousal visa). In that case, they should move in relatively quickly. However, the relative incidence of MSS couples does not jump in 2013. Instead, it slowly increases (Figure 2a).

D Downstream Outcomes

Spousal visa access increases the mixed-citizenship coupled and marriage rates for same-sex attracted individuals. This can affect downstream outcomes in three ways: demographic accounting, the market for romantic partners, and specific benefits of spousal visas. More specifically, with more MSS couples, same-sex couples will more closely resemble MSS couples by accounting for the demographic change. With more entrants and new benefits to marriage, the marriage market

participants can compete to make themselves attractive. Similarly, a mechanical marriage market reallocation can also change the characteristics of same-sex couples. Lastly, the benefits of spousal visas may affect the attributes of same-sex couples directly—for example, increased marriage and naturalization.

1 Assortative Mating

The increase in MSS-coupled individuals naturally increases the proportion of same-sex couples with characteristics common to MSS couples. MSS couples match more disassortatively than NSS couples by birth country, race, education, and age (Table A2). I estimate Equation (7) where the attribute A represents discordant birth countries (domestic, abroad), discordant race (non-Hispanic white, Hispanic white, black, other), an education gap of three or more years, or an age gap of five or more years. Table 5 presents the results. Spousal visa access leads to downstream increases in disassortative mating by birth country by (10.6% and race by (7.0%), although the latter is insignificant. However, the coefficients point to greater assortative mating by education by 4.6% and age by 7.3%. The education estimate is not statistically significant. The age estimate is significant at the 1% level. However, the parallel pre-trends test rejects the assumption at the 10% level.

Increases in MSS couples can mechanically explain the increased disassortativeness by birth country and race. However, it cannot explain increased assortative mating by education and age. Instead, this suggests that same-sex couples match more closely on education and age. If we think of couples as maximizing (market and home) income or creating household goods, then closer matching on education can indicate higher total production (Becker, 1974) or higher investment in household goods (like children) (Lafortune and Low, 2023). Thus, these pairings are of higher quality.

Closer matches on education and age can also reflect a thicker market. While *United States v. Windsor* allows non-permanent residents to participate in the marriage market, contemporaneous same-sex marriage legalization and decreases in stigma can also facilitate entry into the same-sex marriage market. Thicker markets at work or school can create closer matches on education and

age (Mansour and McKinnish, 2014).

Marriage market participants can also make themselves more attractive. Lafortune (2013) shows that immigrants increase educational attainment to find citizen spouses. Same-sex attracted non-citizens could do the same; however, same-sex couples are highly educated, and as more couples form, that positive selection on education diminishes (Table A17). The share of same-sex couples with one partner in school does not change (Table 6). Hence, I do not observe a response on educational investment.

Cultural affinity, on the other hand, is another important aspect of partner selection (Adda, Pinotti and Tura, 2024). Although MSS couples increase, the share of same-sex couples that both speak English well does not change (Table 6), and the non-citizens in MSS couples are more likely to be born in countries where homosexuality is legal (Table A13). These results are consistent with language and cultural affinity playing a meaningful role in couple formation. Furthermore, looking at the top twenty most common birth countries for non-citizens in same-sex marriages and different-sex marriages, I also observe that non-citizen same-sex spouses, compared to non-citizen different-sex spouses, are roughly twice as likely to be born in Australia, Brazil, Colombia, France, Spain, Taiwan, and Venezuela (countries with same-sex marriage and anti-discrimination laws, apart from Venezuela[10]). Whereas different-sex spouses are at least twice as likely to be born in Haiti, India, Jamaica, and Korea (countries without same-sex marriage) (Table A5). It appears that people from countries where it is costly to be out of the closet are less likely to be in a same-sex marriage. Likewise, people from countries that treat same-sex couples fairly are more likely to be in a same-sex marriage in the United States. Thus, this observation highlights the cultural factors and costs that influence couple formation.

2 Immigrants' Characteristics

Non-citizens who gain citizen partners can also gain Green Cards, which bestow the right to work, study, or do neither and enjoy leisure. Do non-citizens enter or leave the workforce? On the

[10] Venezuela's courts and president have asked parliament to legalize same-sex marriage; however, there is an enduring political crisis. Venezuela's anti-discrimination laws are limited.

one hand, Wang (2021) finds employed non-permanent residents may be in indentured servitude; however, marrying a citizen does not increase job switching. On the other hand, spousal visa holders can have lower education and employment because they could not acquire employment and the work visa that comes with it Jasso, Rosenzweig and Smith (2000); Guven, Tong and Yuksel (2020). Hence, spousal visa access could increase or decrease non-citizens' labor supply.

To probe this, I estimate Equation (7) and split couples by an attribute A indicating exactly one partner employed, in the labor force, or school, or that both partners speak English "very well". Table 6 presents these results. Overall, there are no changes in the share of same-sex couples with precisely one partner employed or in the labor force. This result suggests that MSS couple formation does not affect overall labor supply decisions for same-sex couples on the extensive margin. Likewise, the share of same-sex couples with one partner in school is unchanged. The labor supply and school results suggest that non-citizens switching from work or study visas does not change the share of couples with one working or studying partner. Finally, there is no change in the proportion of same-sex couples who both speak English very well. This result is not self-evident because greater MSS couples could plausibly lead to more couples where one partner faces a linguistic disadvantage in the labor market. However, this does not appear to be the case.

These labor market results also push back on fraud or mail-order spouses because recently arriving partners are not immediately eligible to work and may not speak English well. Instead, these results are consistent with non-citizens already in the United States for work or education finding citizen partners and maintaining their employment status.

3 Naturalization

Non-citizens married to citizens have a higher naturalization rate than other non-citizens (Dziadula, 2020). Does spousal visa access cause more naturalizations? An answer requires observing the grounds for naturalization. However, I do not observe visa types or an individual's naturalization process. Therefore, I cannot distinguish if naturalizations among same-sex couples increase due to their greater numbers or spousal visa access. More same-sex married couples can deterministically

lead to more naturalizations for same-sex spouses. Spousal visas also make naturalization possible after three years instead of five, potentially increasing naturalizations in the short run but not necessarily changing who naturalizes. The number of new citizens married to same-sex citizens for at least three years increases absolutely (Figure A8). Hence, there are more same-sex married naturalized citizens. New citizens married to same-sex citizens also increases relative to other same-sex couples (Figure A9a). This is consistent with a general increase in same-sex marriage among those who will naturalize. It is also consistent with increased naturalization among those who marry a same-sex partner due to spousal visa policy.

E Heterogeneity

I check for treatment effect heterogeneity by the state of residence and non-citizens' birth countries. The results are not noteworthy. Heterogeneity by birth country or state of residence is statistically insignificant (Tables A13 and A15). I also check for heterogeneity by two fundamental demographic characteristics: age and sex. I find that the effect of spousal visa access is larger for younger people than for older people. Still, the difference is statistically insignificant (Table A18).

Similarly, I find the point estimates for men are larger than those for women (Table A21). They are statistically different, at the 10% level but not the 5% level, for the coupled rate but not statistically different for the marriage rate, which is less precise. With fewer observations per state-year, the results are more likely to reflect extensive margin changes (states gain their first MSS couple) than intensive margin changes (states gain additional MSS couples). The panel is also unbalanced because some states don't have any MSS-coupled women, men, or MSS marriages. Nevertheless, men appear to respond more strongly to spousal visa access than women.

It is unclear why this pattern emerges. I speculate two possible explanations. First, same-sex coupled men generally match more disassortatively than same-sex coupled women, notably by race (Jepsen and Jepsen, 2002; Ciscato, Galichon and Goussé, 2020). I also observe this in my data (Table A6). Men's propensity to match disassortatively could explain their more considerable increase

for MSS couples. Understanding this broad difference in homogamy requires further research.[11]

Second, geographic sorting: same-sex attracted men may live in areas with more non-citizens relative to same-sex attracted women. There is some empirical evidence for geographic sorting. Same-sex coupled men are a few percentage points more likely to live in metro areas compared to same-sex coupled women (Table A7). Similarly, same-sex coupled men appear weakly more likely to live in states with a high share of non-citizens relative to same-sex coupled women. In contrast, the opposite is true for women (Table A8). For example, same-sex coupled men are 35% more likely to live in California than same-sex coupled women, likewise for New York (16%)—states in which different-sex coupled non-citizens are more likely to live than same-sex couples. Whereas same-sex coupled women are 22% more likely to live in Washington than same-sex coupled men, likewise for Oregon (38%) and New England: Massachusetts (29%), Vermont (40%), New Hampshire (40%), Maine (40%)—different-sex coupled non-citizens are less likely to live in these states than same-sex couples.

I re-estimate Equation (3) splitting the sample by metropolitan status (Table A22). For urban couples, the effects are similar to the primary estimates. For non-urban couples, the couple estimate is larger but less precise, and the marriage estimate is an imprecise zero. While the coupled rate increases among urban and rural couples, it appears urban couples drive the marriage rate increases exclusively.

VI Conclusion

The Supreme Court ruling in *United States v. Windsor* struck down DOMA, giving federal marriage benefits to same-sex spouses. The resultant spousal visa access caused the mixed-citizenship coupled rate for same-sex attracted individuals to increase by 36%, and their marriage rate increased by 72%. Extrapolating these effects to the broader population suggests approximately 1.5 million peo-

[11] Men face higher costs of having children together, which is the canonical household public good. Therefore, men may differentially substitute children for other household public goods that could be contingent upon an age gap or other differences.

ple have their current partners directly thanks to spousal visas, according to back-of-the-envelope calculations[12]. Spousal visas can improve average match quality indirectly by making the romantic partner market thicker. Consistent with this, I find evidence of closer matching on education and age.

This paper shows that immigration policy can be a marriage policy with unintended consequences, using novel variation to estimate the impact of spousal visa access on couple formation and marriage. Our understanding of immigration laws' effects on household formation and decision-making requires further research, especially in light of the prominent effects in this paper. As policymakers and the general public debate immigration law and the impact of Supreme Court decisions, this paper highlights marriage as both an outcome and policy mediator with implications for families, citizens, and their well-being.

[12]Take the estimate in Table 2 as the true population effect. Then, the proportion of mixed-citizenship couples benefiting from a spousal visa is $0.355/1.355 = 0.26$. There are $5,729,983$ mixed-citizenship coupled individuals estimated from the 2019 ACS. So $5,729,983 \times 0.26 = 1,489,796$ people benefit from a spousal visa.

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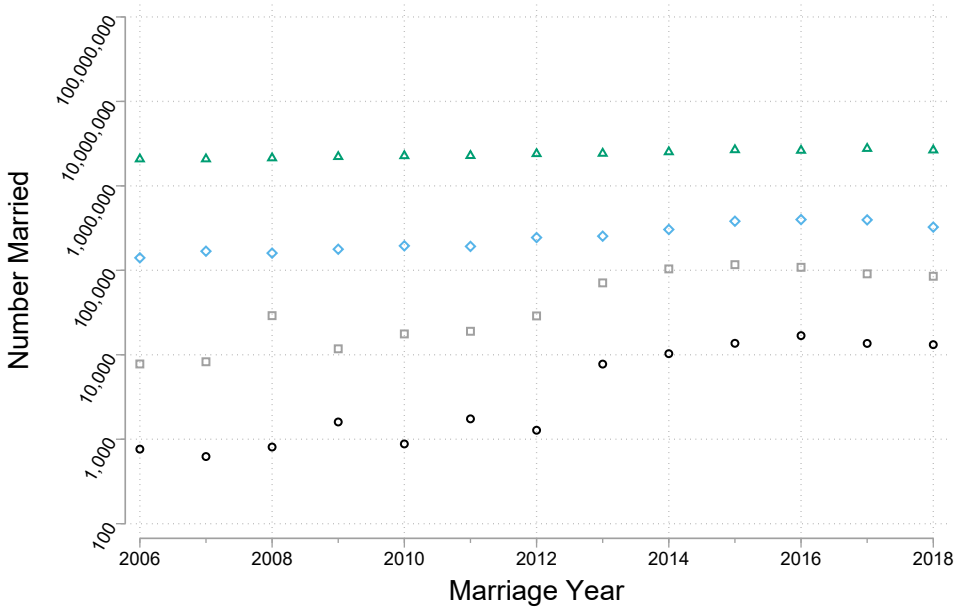
Table 1: Individual-Level Summary Statistics

	MSS	NSS	MDS	NDS
Age	40.62	43.06	41.39	44.79
Male	0.66	0.47	0.50	0.49
Years of Education	14.43	14.77	12.76	13.95
Non-Citizen	0.51	0.02	0.51	0.07
Married	0.53	0.33	0.90	0.88
Any Transfer	0.14	0.20	0.18	0.18
Any Insurance	0.91	0.95	0.84	0.92
Couple Moved to New State	0.03	0.03	0.02	0.02
Partner Moved to New State	0.03	0.02	0.02	0.01
One Partner Born Abroad	0.74	0.08	0.52	0.06
Interracial Couple	0.41	0.21	0.20	0.10
Educ Gap ≥ 3 Years	0.32	0.22	0.32	0.20
Age Gap ≥ 5 Years	0.57	0.46	0.43	0.29
One Partner Employed	0.31	0.25	0.42	0.33
One Partner in LF	0.25	0.20	0.36	0.29
One Partner In School	0.16	0.12	0.10	0.08
Both Speak English Very Well	0.70	0.96	0.49	0.90
Observations	9,034	149,138	639,427	11,429,990

This table reports means and standard deviations (in parentheses) for individuals in four couple types. The intersection of same- or different-sex and same- or mixed-citizenship determines the four couple types: mixed-citizenship same-sex (MSS), same-citizenship same-sex (NSS), mixed-citizenship different-sex (MDS), same-citizenship different-sex (NDS). The data are from the 2008-2019 rounds of the ACS.



(a) by Marriage Year

(b) by Survey Year

Figure 1: Number of Individuals by Couple Type

Each point is the population estimate for the number of individuals in a given couple type and year. The vertical axes depict the number of individuals on a logarithmic scale. The horizontal axes depict years. The intersection of same- or different-sex and same- or mixed-citizenship determines the four couple types. For survey years, each point is a population estimate, representing the United States population in a given survey year. For marriage years, each point represents the population married in a given year conditional on the marriages surviving until 2019; and is representative of the 2019 population.

Table 2: DDD Estimates For Coupled Rate

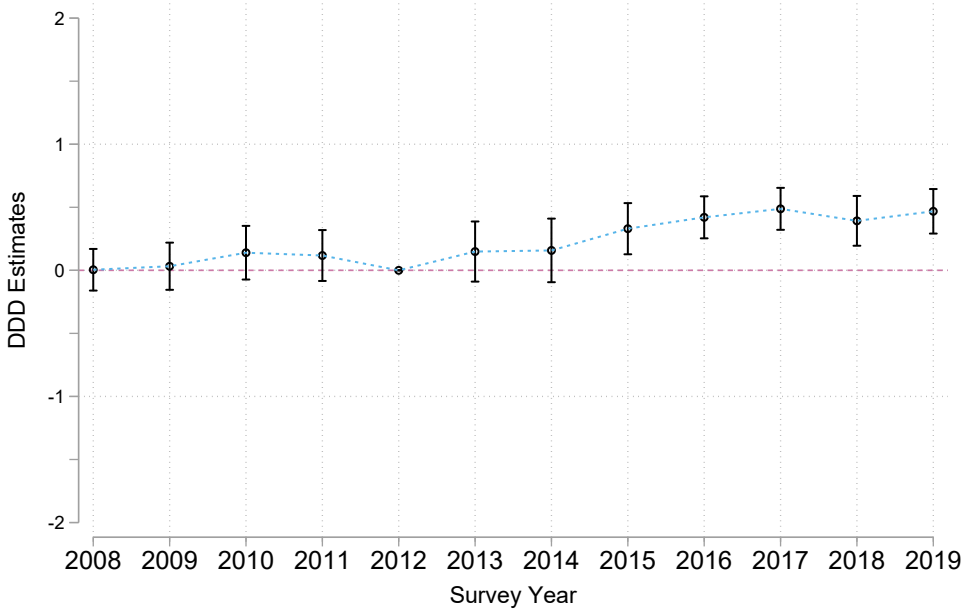
	Coupled Rate Per Adult					
post × M × SS	0.304	0.312	0.356	0.307	0.359	0.306
	(0.053)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
post × SS	0.367	0.357	0.313	0.363	0.310	0.366
	(0.018)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
post × M	0.074	0.065	0.024	0.071	0.021	0.069
	(0.015)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Transfer Benefits		X				
Health Insurance			X			
Moving				X		
Recent Arrival					X	
State Demographics						X
Observations	2,448	2,448	2,448	2,448	2,448	2,448
Log Likelihood	-666,781	-647,866	-534,274	-655,085	-552,346	-526,704
Relative IRR	1.355	1.367	1.428	1.359	1.432	1.358
SE	0.072	0.073	0.075	0.072	0.076	0.066
p-value	0.000	0.000	0.000	0.000	0.000	0.000
χ^2 RESET Test	2.764	2.189	3.557	3.040	1.385	0.411
p-value	0.251	0.335	0.169	0.219	0.500	0.814
χ^2 Pre-Trend Test	3.174	3.590	5.692	3.254	4.112	3.306
p-value	0.529	0.464	0.223	0.516	0.391	0.508

This table reports the Quasi-Maximum Likelihood estimates of the Poisson Conditional Fixed Effects model described by Equation (3). SS refers to same-sex coupled individuals, M refers to mixed-citizenship coupled individuals, and $post$ refers to 2013 or later. The coefficient of interest is $post \times SS \times M$, and the Relative Incidence Rate Ratio (IRR) is the exponentiated coefficient of interest. The χ^2 RESET Test line reports the statistics from the misspecification test described by Equation (4). The χ^2 Pre-Trend Test line reports the test statistic for the parallel pre-trends test described by Equation (6). Standard errors are in parentheses, clustered at the group-state level.

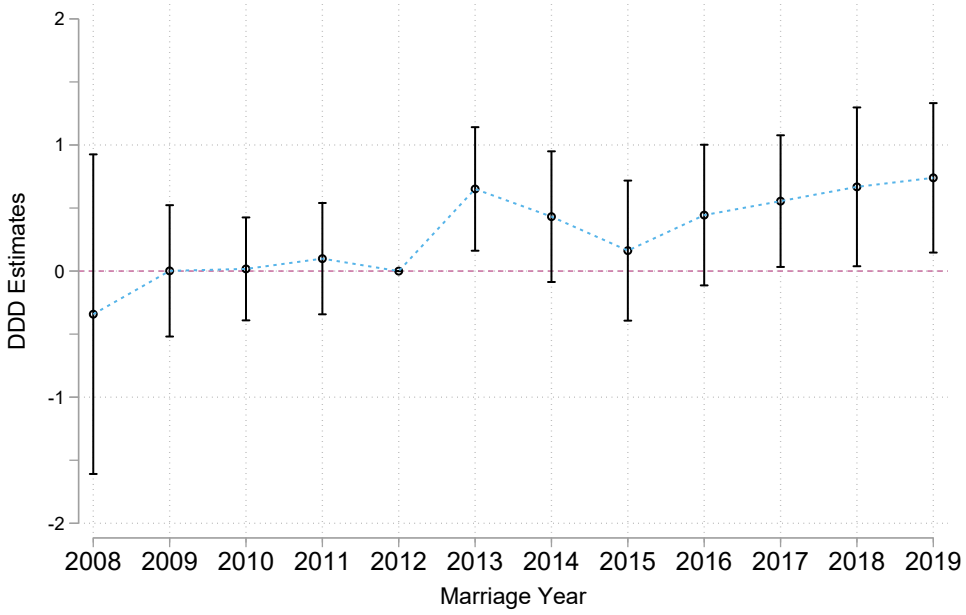
Table 3: DDD Estimates For Marriage Rate

	Marriage Rate Per Adult Per Year					
post × M × SS	0.540	1.238	1.400	0.997	1.351	0.531
	(0.179)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
post × SS	1.383	0.542	0.344	0.868	0.321	1.401
	(0.153)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
post × M	-0.008	-0.696	-0.854	-0.458	-0.807	0.005
	(0.015)	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)
Transfer Benefits		X				
Health Insurance			X			
Moving				X		
Recent Arrival					X	
State Demographics						X
Observations	2,436	2,448	2,448	2,448	2,448	2,448
Log Likelihood	-14,930,592	-7,369,073	-4,178,118	-7,004,612	-3,971,369	-3,264,687
Relative IRR	1.716	3.450	4.054	2.710	3.862	1.700
SE	0.307	0.624	0.709	0.486	0.702	0.319
p-value	0.020	0.000	0.000	0.000	0.000	0.028
χ^2 RESET Test	3.167	2.628	12.038	3.909	12.964	3.640
p-value	0.205	0.269	0.002	0.142	0.002	0.162
χ^2 Pre-Trend Test	0.457	0.451	0.372	0.529	0.392	0.459
p-value	0.978	0.978	0.985	0.971	0.983	0.977

This table reports the Quasi-Maximum Likelihood estimates of the Poisson Conditional Fixed Effects model described by Equation (3). SS refers to same-sex coupled individuals, M refers to mixed-citizenship coupled individuals, and $post$ refers to 2013 or later. The coefficient of interest is $post \times SS \times M$, and the Relative Incidence Rate Ratio (IRR) is the exponentiated coefficient of interest. The χ^2 RESET Test line reports the statistics from the misspecification test described by Equation (4). The χ^2 Pre-Trend Test line reports the test statistic for the parallel pre-trends test described by Equation (6). Standard errors are in parentheses, clustered at the group-state level.



(a) Coupled Individuals by Survey Year



(b) Married Individuals by Marriage Year

Figure 2: Dynamic DDD Estimates

This figure plots the Quasi-Maximum Likelihood estimates of the Poisson Conditional Fixed Effects model described by Equation (5), where time is either Survey Year or Marriage Year. I cluster standard errors at the group-state level.

Table 4: DDD Estimates For Coupled Rate - Alternative Channels

	Coupled Rate Per Adult			
	Any Transfer	Any Insurance	Joint Move	Partner Move
post × A × SS	-0.029	0.148	-0.000	0.025
	(0.033)	(0.098)	(0.050)	(0.062)
post × SS	0.389	0.232	0.383	0.383
	(0.021)	(0.096)	(0.018)	(0.019)
post × A	0.026	0.427	0.114	-0.006
	(0.014)	(0.051)	(0.017)	(0.015)
Observations	2,448	2,436	2,436	2,436
Log Likelihood	-1,993,173	-2,435,592	-671,942	-624,212
Relative IRR	0.971	1.160	1.000	1.025
SE	0.032	0.114	0.050	0.063
p-value	0.367	0.160	0.997	0.692
χ^2 Pre-Trend Test	0.574	2.546	1.100	4.469
p-value	0.966	0.636	0.894	0.346

This table reports the Quasi-Maximum Likelihood estimates of the Poisson Conditional Fixed Effects model described by Equation (7). SS refers to same-sex coupled individuals, A refers to individuals in couples with an attribute described by the column headers, and $post$ refers to 2013 or later. The coefficient of interest is $post \times SS \times A$, and the Relative Incidence Rate Ratio (IRR) is the exponentiated coefficient of interest. The χ^2 Pre-Trend Test line reports the test statistic for the parallel pre-trends test described by Equation (6). Standard errors are in parentheses, clustered at the group-state level.

Table 5: DDD Estimates for Disassortative Attributes

	Coupled Rate Per Adult			
	Birthplace	Race	Education	Age
post × A × SS	0.101	0.068	-0.047	-0.076
	(0.046)	(0.046)	(0.031)	(0.029)
post × SS	0.369	0.350	0.394	0.424
	(0.017)	(0.017)	(0.021)	(0.021)
post × A	0.114	0.181	0.026	-0.027
	(0.010)	(0.016)	(0.009)	(0.010)
Observations	2,448	2,448	2,448	2,448
Log Likelihood	-668,806	-850,751	-626,325	-639,834
Relative IRR	1.106	1.070	0.954	0.927
SE	0.051	0.049	0.030	0.027
p-value	0.038	0.155	0.119	0.006
χ^2 Pre-Trend Test	4.809	2.231	1.299	7.855
p-value	0.307	0.693	0.862	0.097

This table reports the Quasi-Maximum Likelihood estimates of the Poisson Conditional Fixed Effects model described by Equation (7). SS refers to same-sex coupled individuals, A refers to individuals in couples with an attribute described by the column headers, and $post$ refers to 2013 or later. Specifically, A represents: one partner born abroad and the other domestically (Birthplace), different races (Race), an education gap of five or more years (Education), or an age gap of three or more years (Age). The coefficient of interest is $post \times SS \times A$, and the Relative Incidence Rate Ratio (IRR) is the exponentiated coefficient of interest. The χ^2 Pre-Trend Test line reports the test statistic for the parallel pre-trends test described by Equation (6). Standard errors are in parentheses, clustered at the group-state level.

Table 6: DDD Estimates for Labor Supply Attributes

	Coupled Rate Per Adult			
	One Employed	One in LF	One in School	Both Speak English
post × A × SS	-0.001	0.017	-0.026	-0.008
	(0.033)	(0.031)	(0.038)	(0.051)
post × SS	0.377	0.382	0.393	0.395
	(0.016)	(0.018)	(0.018)	(0.048)
post × A	-0.075	0.018	-0.134	-0.054
	(0.012)	(0.011)	(0.013)	(0.019)
Observations	2,448	2,448	2,448	2,448
Log Likelihood	-1,049,799	-733,689	-738,266	-743,443
Relative IRR	0.999	1.017	0.974	0.992
SE	0.033	0.032	0.037	0.051
p-value	0.974	0.591	0.485	0.870
χ^2 Pre-Trend Test	16.566	6.956	5.010	10.831
p-value	0.002	0.138	0.286	0.029

This table reports the Quasi-Maximum Likelihood estimates of the Poisson Conditional Fixed Effects model described by Equation (7). SS refers to same-sex coupled individuals, A refers to individuals in couples with an attribute described by the column headers, and $post$ refers to 2013 or later. Specifically, A represents: one partner employed (One Employed), one partner in the labor force (One in LF), one partner in school (One in School), or both partners speak English very well (Both Speak English). The coefficient of interest is $post \times SS \times A$, and the Relative Incidence Rate Ratio (IRR) is the exponentiated coefficient of interest. The χ^2 Pre-Trend Test line reports the test statistic for the parallel pre-trends test described by Equation (6). Standard errors are in parentheses, clustered at the group-state level.

A Online Appendix

A Timing of State-Level Same-Sex Marriage Laws

Table A1 lists states by their timing of same-sex marriage legalization, noting the method and existing alternatives to marriage.

Table A1: Timing of Same-Sex Marriage Legalization

State	Effective	Granting Body	Alternatives
Massachusetts	May 17, 2004	State Court	
Connecticut	Nov 12, 2008	State Court	Civil Unions, 2005
Iowa	May 25, 2009	State Court	
Vermont	Sep 1, 2009	Legislature	Civil Unions, 2000
New Hampshire	Jan 1, 2010	Legislature	Civil Unions, 2008
Dist of Col	Mar 3, 2010	Legislature	Domestic Partnership, 2002
			Recognition of Marriages, 2009
New York	Jul 24, 2011	Legislature	Recognition of Marriages, 2010
Washington	Dec 9, 2012	Voters & Leg	Domestic Partnerships, 2007
Maine	Dec 29, 2012	Voters	Domestic Partnerships, 2004
Maryland	Jan 1, 2013	Voters & Leg	Domestic Partnerships, 2008
California	Jun 28, 2013	Federal Court	Domestic Partnerships, 2000/2005
		State Court	Legal from June 16-Nov 4, 2008
Delaware	Jul 1, 2013	Legislature	Civil Unions, 2012
Minnesota	Aug 1, 2013	Legislature	
Rhode Island	Aug 1, 2013	Legislature	Civil Unions, 2011
New Jersey	Oct 21, 2013	State Court	Civil Unions, 2007
Hawai‘i	Dec 2, 2013	Legislature	Civil Unions, 2012
			Reciprocal Beneficiaries, 1997
New Mexico	Dec 19, 2013	State Court	
Oregon	May 19, 2014	Federal Court	Domestic Partnerships, 2008
Pennsylvania	May 20, 2014	Federal Court	
Illinois	Jun 1, 2014	Legislature	Civil Unions, 2011

Oklahoma	Oct 6, 2014	Federal Court	
Utah	Oct 6, 2014	Federal Court	
		Federal Court	Legal from Dec 20, 2013-Jan 6, 2014
Virginia	Oct 6, 2014	Federal Court	
Colorado	Oct 7, 2014	Federal Court	Designated Beneficiary, 2009
			Civil Unions, 2013
Indiana	Oct 7, 2014	Federal Court	
Wisconsin	Oct 7, 2014	Federal Court	Domestic Partnerships, 2009
		Federal Court	Legal from June 6-13, 2014
Nevada	Oct 9, 2014	Federal Court	Domestic Partnerships, 2009
West Virginia	Oct 9, 2014	Federal Court	
North Carolina	Oct 10, 2014	Federal Court	
Idaho	Oct 15, 2014	Federal Court	
Alaska	Oct 17, 2014	Federal Court	
Arizona	Oct 17, 2014	Federal Court	
Wyoming	Oct 21, 2014	Federal Court	
Montana	Nov 19, 2014	Federal Court	
South Carolina	Nov 19, 2014	Federal Court	
Florida	Jan 6, 2015	Federal Court	
Alabama	Jun 26, 2015	Federal Court	
		Federal Court	Legal from Feb 9-March 3, 2015
Arkansas	Jun 26, 2015	Federal Court	
		State Court	Legal from May 9-16, 2014
Georgia	Jun 26, 2015	Federal Court	
Kansas	Jun 26, 2015	Federal Court	
		County Courts	Up to counties since Nov 13, 2014
Kentucky	Jun 26, 2015	Federal Court	
Louisiana	Jun 26, 2015	Federal Court	
Michigan	Jun 26, 2015	Federal Court	
		Federal Court	Briefly legal on March 21, 2014
Mississippi	Jun 26, 2015	Federal Court	
Missouri	Jun 26, 2015	Federal Court	Recognition of Marriages Oct 3, 2014
		Federal Court	Legal since Nov 5, 2014 in St Louis
		Federal Court	Since Nov 7, 2014 in Jackson County
Nebraska	Jun 26, 2015	Federal Court	
North Dakota	Jun 26, 2015	Federal Court	
Ohio	Jun 26, 2015	Federal Court	
South Dakota	Jun 26, 2015	Federal Court	
Tennessee	Jun 26, 2015	Federal Court	
Texas	Jun 26, 2015	Federal Court	

"Effective" refers to the effective date when same-sex marriage became permanently legal. Some indigenous tribes allow same-sex marriage before or after it is legalized elsewhere in the state. Massachusetts allows out-of-state same-sex couples to marry since July 31, 2008. Exceptions to the marriage laws are only listed for states forced to legalise same-sex marriage resulting from the Supreme Court ruling in *Obergefell v. Hodges*. Created using Table 1 from Hansen, Martell and Roncolato (2020), with additional information from the National Center for Lesbian Rights (2018).

B Additional Summary Statistics

Table A2: Additional Individual-Level Summary Statistics

	MSS	NSS	MDS	NDS
Foodstamps	0.08	0.10	0.13	0.09
	(0.27)	(0.30)	(0.33)	(0.28)
TANF	0.02	0.02	0.02	0.01
	(0.13)	(0.15)	(0.14)	(0.12)
Soc Sec	0.06	0.10	0.05	0.10
	(0.23)	(0.30)	(0.22)	(0.30)
Supp Sec	0.02	0.03	0.02	0.02
	(0.13)	(0.18)	(0.13)	(0.15)
Employer Ins	0.76	0.81	0.63	0.77
	(0.43)	(0.39)	(0.48)	(0.42)
Private Ins	0.84	0.89	0.71	0.86
	(0.36)	(0.32)	(0.45)	(0.35)
Public Ins	0.17	0.21	0.20	0.18
	(0.38)	(0.41)	(0.40)	(0.38)
Purchased Ins	0.18	0.18	0.13	0.14
	(0.38)	(0.38)	(0.34)	(0.35)
Couple Moved from Abroad	0.00	0.00	0.01	0.00
	(0.06)	(0.04)	(0.07)	(0.05)
Couple Moved between States	0.02	0.02	0.02	0.02
	(0.15)	(0.15)	(0.13)	(0.13)
Couple Moved within State	0.12	0.12	0.11	0.09
	(0.33)	(0.33)	(0.31)	(0.28)
Couple Moved	0.16	0.16	0.14	0.11
	(0.37)	(0.37)	(0.35)	(0.31)
Partner Moved from Abroad	0.01	0.00	0.02	0.00
	(0.11)	(0.06)	(0.13)	(0.05)
Partner Moved between States	0.02	0.02	0.01	0.01
	(0.13)	(0.13)	(0.08)	(0.08)
Partner Moved within State	0.04	0.04	0.02	0.02
	(0.20)	(0.19)	(0.13)	(0.12)
Partner Moved	0.06	0.05	0.03	0.02
	(0.24)	(0.22)	(0.17)	(0.14)
One Partner Born in China	0.02	0.00	0.03	0.01
	(0.15)	(0.05)	(0.17)	(0.09)
One Partner Born in India	0.01	0.00	0.02	0.01
	(0.11)	(0.05)	(0.16)	(0.11)
One Partner Born in Mexico	0.25	0.02	0.34	0.05
	(0.43)	(0.13)	(0.47)	(0.22)
One Partner Born in Philippines	0.06	0.01	0.04	0.01
	(0.23)	(0.09)	(0.20)	(0.10)
NC Arrived $\leq$ 3 Years Ago	0.17	0.98	0.11	0.94
	(0.38)	(0.13)	(0.32)	(0.24)
Observations	9,034	149,138	639,427	11,429,990

This table reports means and standard deviations (in parentheses) for individuals in four couple types. The intersection of same- or different-sex and same- or mixed-citizenship determines the four couple types: mixed-citizenship same-sex (MSS), same-citizenship same-sex (NSS), mixed-citizenship different-sex (MDS), same-citizenship different-sex (NDS). The data are from the 2008-2019 rounds of the ACS.

Table A3: Individual-Level Summary Statistics - Married Individuals

	MSS	NSS	MDS	NDS
Age	40.14	44.09	36.57	36.37
	(10.46)	(11.37)	(9.63)	(9.80)
Male	0.69	0.44	0.50	0.50
	(0.46)	(0.50)	(0.50)	(0.50)
Years of Education	14.68	15.15	13.55	14.32
	(3.17)	(2.49)	(3.48)	(2.67)
Non-Citizen	0.52	0.02	0.51	0.08
	(0.50)	(0.14)	(0.50)	(0.28)
Married	1.00	1.00	1.00	1.00
	(0.00)	(0.00)	(0.00)	(0.00)
Any Transfer	0.10	0.16	0.15	0.13
	(0.31)	(0.37)	(0.36)	(0.34)
Any Insurance	0.93	0.97	0.86	0.93
	(0.25)	(0.17)	(0.34)	(0.25)
Couple Moved to New State	0.02	0.03	0.04	0.04
	(0.16)	(0.17)	(0.19)	(0.19)
Partner Moved to New State	0.02	0.01	0.04	0.01
	(0.15)	(0.12)	(0.20)	(0.10)
One Partner Born Abroad	0.74	0.09	0.56	0.07
	(0.44)	(0.29)	(0.50)	(0.25)
Interracial Couple	0.43	0.22	0.24	0.14
	(0.50)	(0.42)	(0.43)	(0.35)
Educ Gap ≥ 3 Years	0.32	0.23	0.29	0.19
	(0.47)	(0.42)	(0.45)	(0.39)
Age Gap ≥ 5 Years	0.59	0.45	0.46	0.30
	(0.49)	(0.50)	(0.50)	(0.46)
One Partner Employed	0.31	0.24	0.42	0.30
	(0.46)	(0.43)	(0.49)	(0.46)
One Partner in LF	0.25	0.21	0.36	0.26
	(0.44)	(0.41)	(0.48)	(0.44)
One Partner In School	0.15	0.11	0.13	0.12
	(0.36)	(0.31)	(0.34)	(0.33)
Both Speak English Very Well	0.70	0.97	0.54	0.91
	(0.46)	(0.17)	(0.50)	(0.28)
Observations	4,144	37,968	161,738	1,564,526

This table reports means and standard deviations (in parentheses) for married individuals in four couple types. The intersection of same- or different-sex and same- or mixed-citizenship determines the four couple types: mixed-citizenship same-sex (MSS), same-citizenship same-sex (NSS), mixed-citizenship different-sex (MDS), same-citizenship different-sex (NDS). The data are from the 2012-2019 rounds of the ACS and for couples married after 2008.

Table A4: Aditional Individual-Level Summary Statistics - Married Individuals

	MSS	NSS	MDS	NDS
Marriage Year	2,014.23	2,013.57	2,012.20	2,011.98
	(2.29)	(2.65)	(2.81)	(2.81)
Foodstamps	0.05	0.06	0.12	0.09
	(0.22)	(0.25)	(0.33)	(0.29)
TANF	0.01	0.01	0.02	0.01
	(0.12)	(0.12)	(0.13)	(0.12)
Soc Sec	0.05	0.10	0.03	0.04
	(0.22)	(0.29)	(0.17)	(0.19)
Supp Sec	0.01	0.02	0.01	0.02
	(0.11)	(0.15)	(0.11)	(0.13)
Employer Ins	0.77	0.84	0.63	0.78
	(0.42)	(0.36)	(0.48)	(0.41)
Private Ins	0.87	0.92	0.73	0.86
	(0.34)	(0.27)	(0.44)	(0.35)
Public Ins	0.15	0.18	0.21	0.15
	(0.36)	(0.38)	(0.40)	(0.36)
Purchased Ins	0.18	0.14	0.14	0.12
	(0.38)	(0.35)	(0.34)	(0.32)
Couple Moved from Abroad	0.00	0.00	0.01	0.01
	(0.04)	(0.05)	(0.09)	(0.08)
Couple Moved between States	0.02	0.03	0.03	0.03
	(0.15)	(0.16)	(0.16)	(0.18)
Couple Moved within State	0.11	0.10	0.15	0.14
	(0.31)	(0.30)	(0.35)	(0.35)
Couple Moved	0.14	0.13	0.20	0.18
	(0.35)	(0.34)	(0.40)	(0.39)
Partner Moved from Abroad	0.01	0.00	0.04	0.00
	(0.08)	(0.07)	(0.19)	(0.07)
Partner Moved between States	0.02	0.01	0.01	0.01
	(0.12)	(0.10)	(0.09)	(0.08)
Partner Moved within State	0.03	0.02	0.02	0.02
	(0.17)	(0.14)	(0.13)	(0.13)
Partner Moved	0.04	0.03	0.04	0.02
	(0.20)	(0.17)	(0.20)	(0.15)
One Partner Born in China	0.03	0.00	0.04	0.01
	(0.17)	(0.06)	(0.19)	(0.09)
One Partner Born in India	0.01	0.00	0.03	0.02
	(0.12)	(0.06)	(0.17)	(0.14)
One Partner Born in Mexico	0.25	0.02	0.29	0.04
	(0.43)	(0.12)	(0.45)	(0.20)
One Partner Born in Philippines	0.06	0.01	0.05	0.01
	(0.24)	(0.10)	(0.21)	(0.09)
NC Arrived ≤ 3 Years Ago	0.27	0.98	0.23	0.93
	(0.45)	(0.12)	(0.42)	(0.25)
Observations	4,144	37,968	161,738	1,564,526

This table reports means and standard deviations (in parentheses) for married individuals in four couple types. The intersection of same- or different-sex and same- or mixed-citizenship determines the four couple types: mixed-citizenship same-sex (MSS), same-citizenship same-sex (NSS), mixed-citizenship different-sex (MDS), same-citizenship different-sex (NDS). The data are from the 2012-2019 rounds of the ACS and for couples married after 2008.

Table A5: Individual-Level Summary Statistics - Birth Country of Non-Citizens in Mixed-Citizenship Marriages

	Same-Sex Spouse	Different-Sex Spouse
Mexico	0.234	0.327
Canada	0.052	0.041
Philippines	0.061	0.040
United Kingdom	0.041	0.036
China	0.027	0.032
El Salvador	0.018	0.026
India	0.012	0.025
Dominican Republic	0.014	0.021
Germany	0.019	0.020
Korea	0.007	0.020
Japan	0.012	0.019
Colombia	0.035	0.018
Vietnam	0.013	0.017
Guatemala	0.016	0.015
Jamaica	0.004	0.014
Brazil	0.047	0.014
Honduras	0.015	0.012
Haiti	0.006	0.012
Cuba	0.016	0.012
Peru	0.016	0.011
Venezuela	0.019	0.006
France	0.014	0.006
Australia	0.017	0.006
Taiwan	0.012	0.005
Spain	0.013	0.004
Observations	2,519	295,096

This table reports the share of non-citizens born in a given country, for same-sex coupled and different-sex coupled non-citizens. These countries are the union of the top 20 most common birth countries for both couple types. The data are from the 2008-2019 rounds of the ACS.

Table A6: Individual-Level Summary Statistics

	Same-Sex Coupled	
	Women	Men
Discordant Citizenships	0.04	0.08
	(0.20)	(0.27)
One Partner Born Abroad	0.09	0.15
	(0.28)	(0.36)
Interracial Couple	0.18	0.26
	(0.39)	(0.44)
Educ Gap ≥ 3 Years	0.21	0.25
	(0.41)	(0.44)
Age Gap ≥ 5 Years	0.44	0.50
	(0.50)	(0.50)
Couple Has Kids	0.32	0.13
	(0.47)	(0.34)
Observations	80,916	77,256

This table reports means and standard deviations (in parentheses) for individuals in same-sex couples, separately for women and men. The data are from the 2008-2019 rounds of the ACS.

Table A7: Individual-Level Summary Statistics - Share Living in a Metropolitan Area

	MSS	NSS	MDS	NDS
% of Women In Metro	0.902	0.817	0.899	0.718
% of Men In Metro	0.930	0.873	0.900	0.721
Observations	9,034	149,138	639,427	11,429,990

This table reports the share of individuals who live in a metropolitan area, by sex and couple type. The data are from the 2008-2019 rounds of the ACS.

Table A8: Individual-Level Summary Statistics - Share Living in Each State

	Same-Sex Coupled		Non-Citizen	
	Women	Men	Women	Men
California	0.127	0.171	0.262	0.267
Texas	0.078	0.074	0.139	0.140
New York	0.063	0.073	0.071	0.072
New Jersey	0.024	0.025	0.042	0.042
Washington	0.033	0.027	0.026	0.025
Massachusetts	0.040	0.031	0.022	0.023
Nevada	0.009	0.012	0.015	0.014
Oregon	0.022	0.016	0.010	0.011
New Mexico	0.009	0.006	0.006	0.006
Rhode Island	0.004	0.005	0.003	0.003
DC	0.004	0.015	0.002	0.002
Delaware	0.004	0.005	0.002	0.002
New Hampshire	0.007	0.005	0.002	0.002
Vermont	0.004	0.002	0.001	0.000
Maine	0.007	0.005	0.001	0.001
Observations	78,470	72,689	474,826	438,653

This table reports the share of the sample living in 15 states, by sex and couple type. The data are from the 2008-2019 rounds of the ACS.

C Additional Results

1 Federal Transfer Benefits

Table A9 assesses relative entry into same-sex couples by federal transfer receipt.

Table A9: DDD Estimates Where Groups are Based on Transfer Receipt

	Coupled Rate Per Adult				
	Food Stamps	Welfare	Soc Sec	Supp Sec	Any
post × A × SS	-0.079	0.054	0.028	-0.154	-0.029
	(0.051)	(0.067)	(0.035)	(0.061)	(0.033)
post × SS	0.391	0.384	0.381	0.387	0.389
	(0.020)	(0.019)	(0.019)	(0.018)	(0.021)
post × A	0.053	-0.179	0.013	0.177	0.026
	(0.028)	(0.024)	(0.008)	(0.015)	(0.014)
Observations	2,448	2,448	2,448	2,448	2,448
Log Likelihood	-2,508,784	-858,100	-721,517	-914,538	-1,993,173
Relative IRR	0.924	1.056	1.029	0.857	0.971
SE	0.047	0.071	0.036	0.053	0.032
p-value	0.108	0.431	0.424	0.007	0.367
χ^2 Pre-Trend Test	1.963	2.652	1.599	7.539	0.574
p-value	0.743	0.618	0.809	0.110	0.966

This table reports estimates for the effect of access to federal marriage benefits for same-sex couples on use of federal transfer benefits of same-sex couples. The benefits are Supplemental Nutrition Assistance Program (Food Stamps), Temporary Assistance for Needy Families (Welfare), Social Security (Soc Sec), Supplemental Security Income (Supp Sec), and Any Transfer (Any), which indicates any of the previous four. The relative incidence rate ratio (IRR) is the exponentiated coefficient of interest. The χ^2 statistic is for a test of parallel pre-trends. Standard errors are clustered at the group-state level.

2 Health Insurance

Table A10 assesses relative entry into same-sex couples by health insurance type.

Table A10: DDD Estimates Where Groups are Based on Health Insurance

	Coupled Rate Per Adult				
	Employer	Private	Public	Purchased	Any
post × A × SS	-0.008	0.075	0.009	-0.081	0.148
	(0.032)	(0.046)	(0.044)	(0.037)	(0.098)
post × SS	0.389	0.313	0.376	0.395	0.232
	(0.023)	(0.040)	(0.026)	(0.018)	(0.096)
post × A	0.005	0.132	0.243	0.072	0.427
	(0.011)	(0.015)	(0.024)	(0.020)	(0.051)
Observations	2,448	2,448	2,448	2,448	2,436
Log Likelihood	-1,125,724	-1,536,496	-1,535,074	-1,231,567	-2,435,592
Relative IRR	0.992	1.078	1.009	0.922	1.160
SE	0.031	0.049	0.045	0.034	0.114
p-value	0.810	0.116	0.836	0.021	0.160
χ^2 Pre-Trend Test	0.634	0.934	8.448	0.850	2.546
p-value	0.959	0.920	0.076	0.932	0.636

This table reports estimates for the effect of access to federal marriage benefits for same-sex couples on the type of health insurance owned by same-sex couple. Health insurance could be from an Employer, it could be Private or Public, it could be Purchased, or it could be any health insurance. The relative incidence rate ratio (IRR) is the exponentiated coefficient of interest. The χ^2 statistic is for a test of parallel pre-trends. Standard errors are clustered at the group-state level.

3 Moved Recently

Table A11 assesses relative entry into same-sex couples by recent joint moves. That is, where both partners moved within the past year.

Table A12 assesses relative entry into same-sex couples by recent moves of exactly one partner.

Table A11: DDD Estimates Where Groups are Based on Jointly Moving within the Past Year

	Coupled Rate Per Adult			
	Abroad	Different State	Within State	Any Move
post × A × SS	0.202	-0.009	0.115	0.092
	(0.220)	(0.056)	(0.046)	(0.037)
post × SS	0.384	0.383	0.370	0.368
	(0.018)	(0.018)	(0.018)	(0.018)
post × A	0.210	0.105	-0.005	0.021
	(0.032)	(0.016)	(0.025)	(0.021)
Observations	2,232	2,436	2,448	2,448
Log Likelihood	-588,695	-664,517	-835,785	-830,593
Relative IRR	1.223	0.991	1.122	1.096
SE	0.270	0.056	0.051	0.041
p-value	0.407	0.874	0.018	0.019
χ^2 Pre-Trend Test	17.766	1.418	1.311	1.803
p-value	0.001	0.841	0.859	0.772

This table reports estimates for the effect of access to federal marriage benefits for same-sex couples on the likelihood same-sex couples moved within the past year. Couples could both move from abroad (Abroad), from another state (Different State), within their state of residence (Within State), or any of the three (Any Move). The relative incidence rate ratio (IRR) is the exponentiated coefficient of interest. The χ^2 statistic is for a test of parallel pre-trends. Standard errors are clustered at the group-state level.

Table A12: DDD Estimates Where Groups are Based on One Partner Moving within the Past Year

	Coupled Rate Per Adult			
	Abroad	Different State	Within State	Any Move
post × A × SS	0.053	-0.007	0.152	0.132
	(0.111)	(0.068)	(0.047)	(0.040)
post × SS	0.383	0.383	0.379	0.379
	(0.018)	(0.019)	(0.019)	(0.019)
post × A	-0.116	0.043	-0.064	-0.061
	(0.029)	(0.017)	(0.011)	(0.011)
Observations	2,316	2,436	2,448	2,448
Log Likelihood	-591,833	-626,574	-627,646	-627,425
Relative IRR	1.054	0.993	1.164	1.141
SE	0.117	0.067	0.055	0.046
p-value	0.642	0.917	0.003	0.002
χ^2 Pre-Trend Test	2.176	8.501	5.075	7.988
p-value	0.703	0.075	0.280	0.092

This table reports estimates for the effect of access to federal marriage benefits for same-sex couples on the likelihood that same-sex couples experienced exactly one partner moving within the past year. A partner could both move from abroad (Abroad), from another state (Different State), within the state of residence (Within State), or any of the three (Any Move). The relative incidence rate ratio (IRR) is the exponentiated coefficient of interest. The χ^2 statistic is for a test of parallel pre-trends. Standard errors are clustered at the group-state level.

4 Birth Country Heterogeneity

Table A13: Heterogeneity by Birth Country - DDD Estimates Restricted by Birth Country

	Same-Sex Marriage Legal	Homosexuality Legal	Binding Visa Cap Country	Low Income Country
post × A × SS	-0.033	0.328	0.170	0.043
	(0.088)	(0.215)	(0.089)	(0.092)
post × SS	0.750	0.417	0.673	0.703
	(0.057)	(0.210)	(0.062)	(0.068)
post × A	-0.154	-0.084	0.072	0.153
	(0.021)	(0.050)	(0.027)	(0.022)
Observations	1,400	1,295	1,407	1,414
Log Likelihood	-162,543	-172,408	-182,293	-166,902
Relative IRR	0.968	1.389	1.185	1.044
SE	0.085	0.299	0.105	0.096
p-value	0.706	0.193	0.078	0.647
χ^2 Pre-Trend Test	0.446	0.088	1.727	0.839
p-value	0.800	0.957	0.422	0.658

This table reports estimates for the effect of access to federal marriage benefits for same-sex couples on the mixed-citizenship same-sex coupled rate, by birth country categories. The sample is necessarily restricted to mixed-citizenship couples only. Countries are split based on the legality of same-sex marriage (Same-Sex Marriage Legal), the legality of homosexuality (Homosexuality Legal), special filing deadlines related to some visas (Binding Visa Cap Countries), and PPP adjusted GNP (Low Income Country). The relative incidence rate ratio (IRR) is the exponentiated coefficient of interest. The χ^2 statistic is for a test of parallel pre-trends. Standard errors are clustered at the group-state level.

5 Main Result without California

Table A14: DDD Estimates for the Main Specification without California

	Coupled Rate Per Adult
post × M × SS	0.286
	(0.067)
post × SS	0.379
	(0.018)
post × M	0.087
	(0.015)
Observations	2,400
Log Likelihood	-636,562
Relative IRR	1.331
SE	0.090
p-value	0.000
χ^2 Pre-Trend Test	1.927
p-value	0.749

This table reports the Poisson Conditional Fixed Effects estimates for Equation (3). SS refers to same-sex coupled individuals and M refers to mixed-citizenship coupled individuals. The coefficient of interest is post×SS×M and the Relative Incidence Rate Ratio (IRR) is the exponentiated coefficient of interest. The χ^2 pre-trend test reports the test statistic for the test of parallel pre-trends, described by Equation (6). Standard errors in parentheses, clustered at the group-state level.

6 State-Level Heterogeneity

Table A15: Heterogeneity by State - DDD Estimates Restricted by State

	Legalized SSM		Non-Citizen Share		Unofficial Share	
	Before 2011	In 2015	High	Low	High	Low
post × M × SS	0.248	0.494	0.229	0.329	0.274	0.335
	(0.068)	(0.156)	(0.108)	(0.060)	(0.045)	(0.094)
post × SS	0.333	0.425	0.408	0.348	0.353	0.382
	(0.018)	(0.037)	(0.018)	(0.024)	(0.015)	(0.034)
post × M	0.051	0.119	0.127	0.059	0.071	0.075
	(0.012)	(0.018)	(0.011)	(0.018)	(0.014)	(0.024)
Observations	336	576	1,248	1,200	1,248	1,200
Log Likelihood	-79,646	-167,188	-255,385	-388,900	-330,918	-312,695
Relative IRR	1.281	1.638	1.258	1.389	1.315	1.398
SE	0.087	0.255	0.136	0.083	0.059	0.131
p-value	0.001	0.012	0.058	0.000	0.000	0.002
χ^2 Pre-Trend Test	12.807	38.802	1.449	5.856	3.753	29.934
p-value	0.012	0.000	0.836	0.210	0.440	0.000

This table reports estimates for the effect of access to federal marriage benefits for same-sex couples on the mixed-citizenship same-sex coupled rate, by different state categories. States are split based on same-sex marriage (SSM) legalization timing, the proportion of people that are non-citizens, and the proportion of non-citizens that are illegally present. The relative incidence rate ratio (IRR) is the exponentiated coefficient of interest. The χ^2 statistic is for a test of parallel pre-trends. Standard errors are clustered at the group-state level.

7 Same-Sex Roommates

Figure A1 shows the number of individuals in two-roommate households, grouped by same-sex and mixed-citizenship. The numbers are stable over time, suggesting there is no relabeling from same-sex roommates to same-sex couples, and that relabeling does not explain the estimated effect size. Specifically, there are 123 695 mixed-citizenship same-sex roommates in 2008 and 128 823 in 2019, ranging between 115 524 and 135 070 across the twelve years. Whereas in Figure 1b, there are 38 819 mixed-citizenship same-sex couples in 2008 and 109 781 in 2019, an increase of nearly 70 000 for which roommate numbers cannot account.

Table A16 shows the number of mixed-citizenship same-sex roommates increased by 8.8% in the post-period, rather than fell. However, the effect is statistically insignificant and the hypothesis of parallel pre-trends is rejected at the 5% level.

Table A16: DDD Estimates for Roommates

	Roommates
post × M × SS	0.085
	(0.059)
post × SS	-0.031
	(0.020)
post × M	0.057
	(0.046)
Observations	2,448
Log Likelihood	-595,933
Relative IRR	1.088
SE	0.064
p-value	0.166
χ^2 Pre-Trend Test	9.548
p-value	0.049

This table reports estimates for the effect of access to federal marriage benefits for same-sex couples on the number of mixed-citizenship same-sex roommates. The relative incidence rate ratio (IRR) is the exponentiated coefficient of interest. The χ^2 statistic is for a test of parallel pre-trends. Standard errors are clustered at the group-state level.

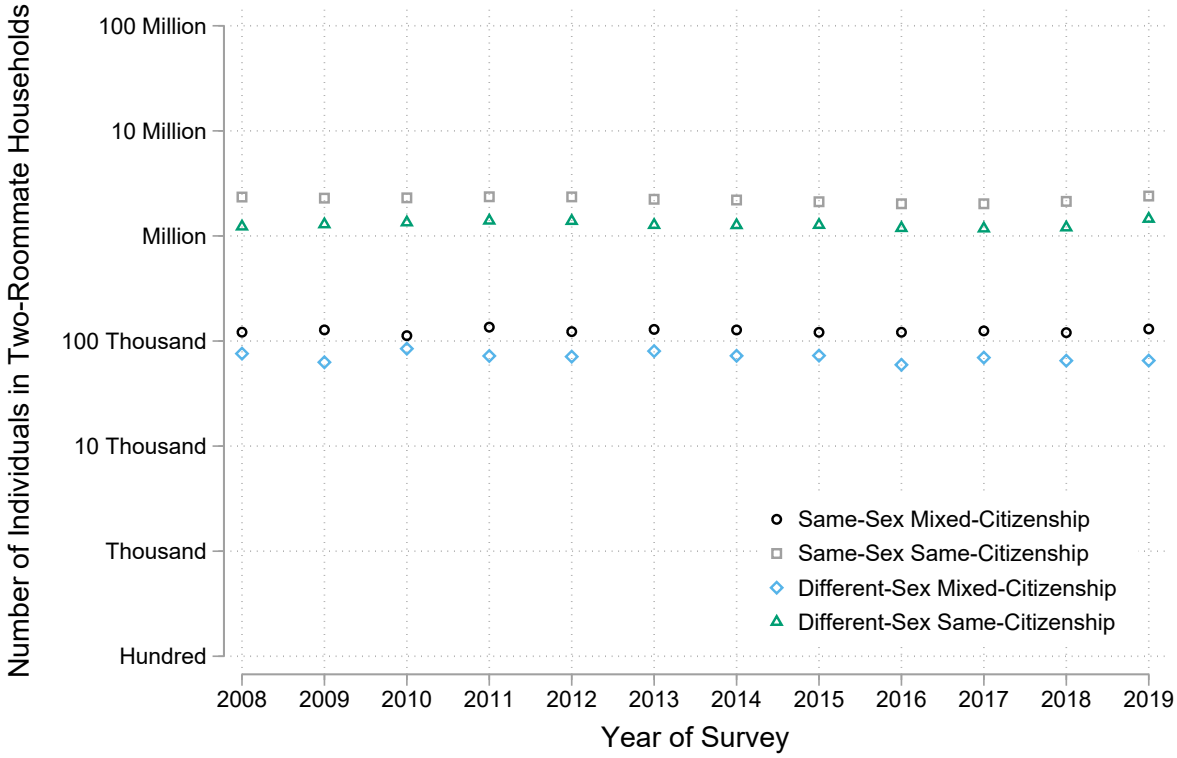


Figure A1: Number of Individuals in a Two-Roommate Household, by Survey Year

Each point is the population estimate for the number of individuals in a given roommate type and year, representative of the United States population in the given year. The vertical axis depicts the number of individuals on a logarithmic scale. The horizontal axis depicts years. The four roommate types are determined by the intersection of same- or different-sex and same- or mixed-citizenship. The sample is restricted to roommates in households with exactly two adults.

8 Household Characteristics

Table A17 assesses relative entry into same-sex couples by household characteristics.

Table A17: DDD Estimates Where Groups are Based on Household Characteristics

	Coupled Rate Per Adult				
	High Income	Good English	High Educ	Has Kids	Extra Adults
post × A × SS	-0.112	-0.008	-0.149	-0.060	-0.020
	(0.029)	(0.051)	(0.029)	(0.033)	(0.036)
post × SS	0.467	0.395	0.416	0.390	0.385
	(0.021)	(0.048)	(0.020)	(0.018)	(0.018)
post × A	0.010	-0.054	0.186	-0.019	0.044
	(0.010)	(0.019)	(0.010)	(0.009)	(0.011)
Observations	2,448	2,448	2,448	2,448	2,448
Log Likelihood	-677,026	-743,443	-1,057,153	-661,740	-694,506
Relative IRR	0.894	0.992	0.862	0.942	0.980
SE	0.026	0.051	0.025	0.031	0.035
p-value	0.000	0.870	0.000	0.059	0.568
χ^2 Pre-Trend Test	2.511	10.831	7.520	6.756	4.959
p-value	0.643	0.029	0.111	0.149	0.292

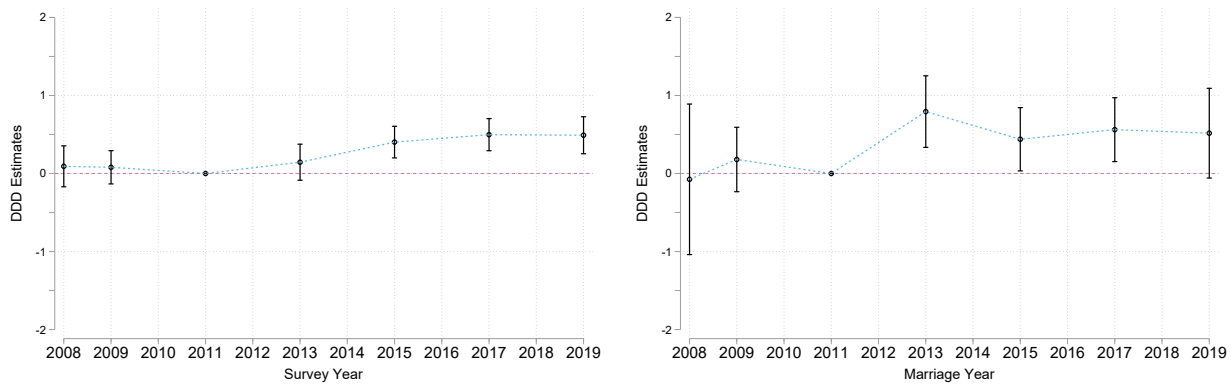
This table reports estimates for the effect of access to federal marriage benefits for same-sex couples on household characteristics of same-sex couples. Household characteristics are: above state-year median income (High Inc), both partners speak English, either "very well" or "only speaks english" (Good English), both partners have a Bachelor's degree (High Educ), children are present in the household (Has Kids), or the presence of other adults in the household (Extra Adults). The relative incidence rate ratio (IRR) is the exponentiated coefficient of interest. The χ^2 statistic is for a test of parallel pre-trends. Standard errors are clustered at the group-state level.

9 Age Heterogeneity

Table A18: Heterogeneity by Age - DDD Estimates Restricted by Age

	Coupled Rate		Marrying Rate	
	Older	Younger	Older	Younger
post × M × SS	0.354	0.593	0.264	0.517
	(0.062)	(0.157)	(0.069)	(0.314)
post × SS	0.535	1.400	0.304	1.141
	(0.022)	(0.126)	(0.021)	(0.272)
post × M	0.024	-0.036	0.134	0.068
	(0.018)	(0.016)	(0.021)	(0.026)
Observations	1,421	1,414	1,414	1,393
Log Likelihood	-297,114	-7,371,243	-258,817	-2,814,778
Relative IRR	1.425	1.810	1.302	1.678
SE	0.089	0.284	0.090	0.527
p-value	0.000	0.004	0.001	0.198
χ^2 Pre-Trend Test	0.649	1.028	2.684	1.356
p-value	0.723	0.598	0.261	0.508

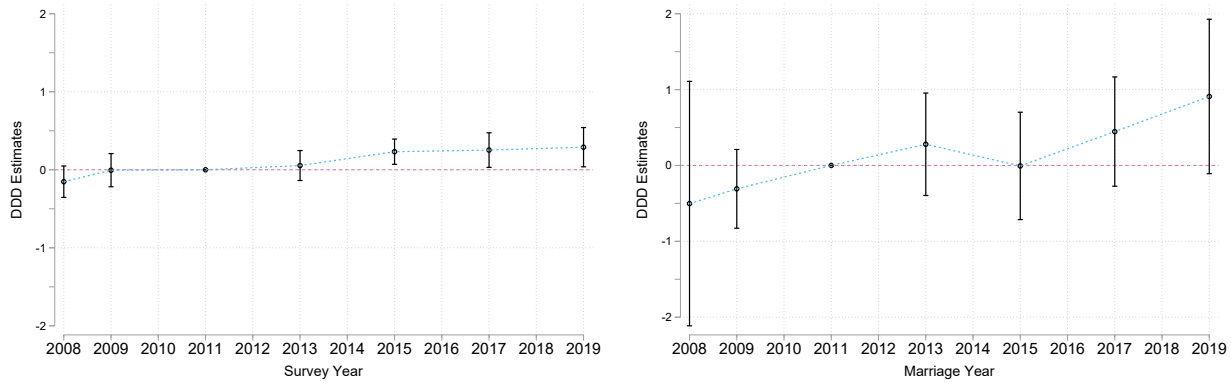
This table reports the Poisson Conditional Fixed Effects estimates for Equation (3). SS refers to same-sex coupled individuals and M refers to mixed-citizenship coupled individuals. The coefficient of interest is post×SS×M and the Relative Incidence Rate Ratio (IRR) is the exponentiated coefficient of interest. The χ^2 pre-trend test reports the test statistic for the test of parallel pre-trends, described by Equation (6). Standard errors in parentheses, clustered at the group-state level.



(a) Couples by Survey Year **(b) Marriages by Marriage Year**

Figure A2: Event Study DDD Estimates for Younger Couples

This figure plots the Poisson Conditional Fixed Effects estimates for Equation (5), where time is either Survey Year or Marriage Year. The sample is restricted to individuals younger than 40 only. Standard errors are clustered at the group-state level.



(a) Couples by Survey Year **(b) Marriages by Marriage Year**

Figure A3: Event Study DDD Estimates for Older Couples

This figure plots the Poisson Conditional Fixed Effects estimates for Equation (5), where time is either Survey Year or Marriage Year. The sample is restricted to individuals 40 or older only. Standard errors are clustered at the group-state level.

10 Main Result with pre-2013 Arrivals

Table A19: DDD Estimates for the Main Specification where all Non-Citizens Arrived pre-2013

	Coupled Rate Per Adult	Marrying Rate Per Adult Per Year
post × M × SS	0.129	0.623
	(0.062)	(0.188)
post × SS	0.374	1.401
	(0.018)	(0.156)
post × M	-0.048	-0.435
	(0.016)	(0.021)
Observations	2,436	2,412
Log Likelihood	-836,277	-13,978,769
Relative IRR	1.138	1.865
SE	0.070	0.350
p-value	0.049	0.013
χ^2 Pre-Trend Test	3.174	0.256
p-value	0.529	0.992

This table reports the Poisson Conditional Fixed Effects estimates for Equation (3). SS refers to same-sex coupled individuals and M refers to mixed-citizenship coupled individuals. The coefficient of interest is post×SS×M and the Relative Incidence Rate Ratio (IRR) is the exponentiated coefficient of interest. The χ^2 pre-trend test reports the test statistic for the test of parallel pre-trends, described by Equation (6). Standard errors in parentheses, clustered at the group-state level.

11 Main Result with Recent Arrivals

Table A20: DDD Estimates for the Main Specification where Non-Citizens Arrived in the Past Three Years

	Coupled Rate Per Adult	Marrying Rate Per Adult Per Year
post × M × SS	0.905	0.478
	(0.237)	(0.237)
post × SS	0.617	1.513
	(0.173)	(0.201)
post × M	-0.169	0.500
	(0.041)	(0.027)
Observations	2,208	2,160
Log Likelihood	-426,480	-1,232,446
Relative IRR	2.472	1.613
SE	0.585	0.383
p-value	0.012	0.109
χ^2 Pre-Trend Test	9.774	0.556
p-value	0.044	0.968

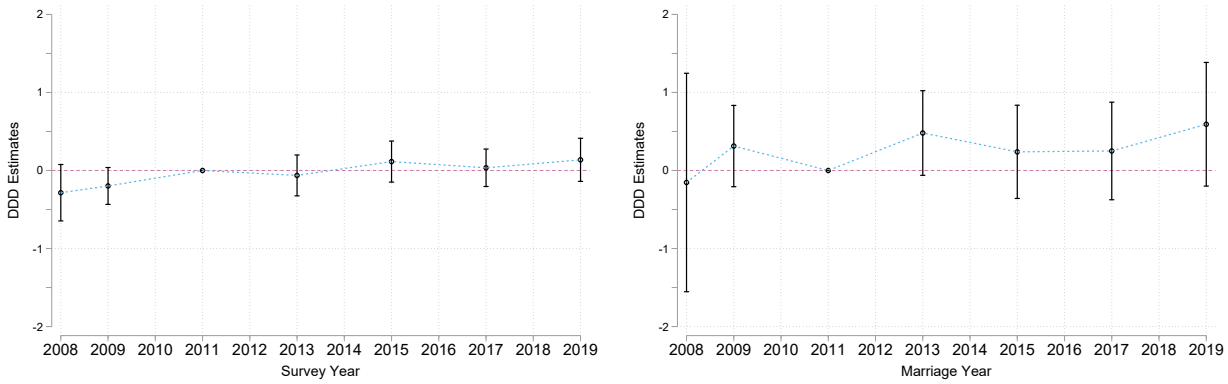
This table reports the Poisson Conditional Fixed Effects estimates for Equation (3). SS refers to same-sex coupled individuals and M refers to mixed-citizenship coupled individuals. The coefficient of interest is post×SS×M and the Relative Incidence Rate Ratio (IRR) is the exponentiated coefficient of interest. The χ^2 pre-trend test reports the test statistic for the test of parallel pre-trends, described by Equation (6). Standard errors in parentheses, clustered at the group-state level.

12 Sex Heterogeneity

Table A21: Heterogeneity by Sex - DDD Estimates Restricted by Sex

	Women		Men	
	Coupled	Marrying	Coupled	Marrying
post × M × SS	0.211	0.354	0.397	0.785
	(0.077)	(0.246)	(0.066)	(0.229)
post × SS	0.408	1.385	0.379	1.185
	(0.028)	(0.217)	(0.018)	(0.197)
post × M	0.080	-0.011	0.080	-0.011
	(0.017)	(0.017)	(0.017)	(0.017)
Observations	1,414	1,386	1,414	1,407
Log Likelihood	-321,321	-9,699,032	-323,507	-9,643,772
Relative IRR	1.235	1.425	1.488	2.191
SE	0.095	0.351	0.097	0.501
p-value	0.014	0.226	0.000	0.017
χ^2 Pre-Trend Test	2.843	1.734	5.079	1.198
p-value	0.241	0.420	0.079	0.549

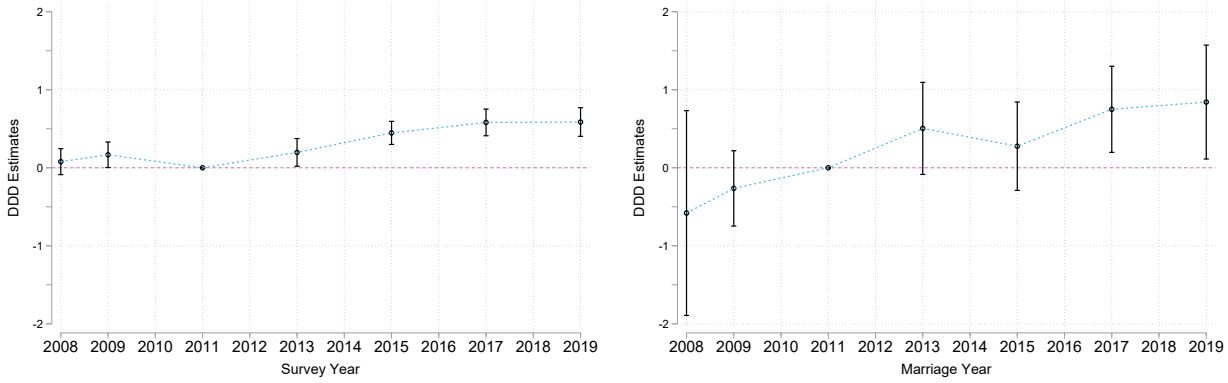
This table reports the Poisson Conditional Fixed Effects estimates for Equation (3). SS refers to same-sex coupled individuals and M refers to mixed-citizenship coupled individuals. The coefficient of interest is post×SS×M and the Relative Incidence Rate Ratio (IRR) is the exponentiated coefficient of interest. The χ^2 pre-trend test reports the test statistic for the test of parallel pre-trends, described by Equation (6). Standard errors in parentheses, clustered at the group-state level.



(a) Coupled Women by Survey Year **(b) Married Women by Marriage Year**

Figure A4: Event Study DDD Estimates for Women

This figure plots the Poisson Conditional Fixed Effects estimates for Equation (5), where time is either Survey Year or Marriage Year. The sample is restricted to women only. Standard errors are clustered at the group-state level.



(a) Coupled Men by Survey Year **(b) Married Men by Marriage Year**

Figure A5: Event Study DDD Estimates for Men

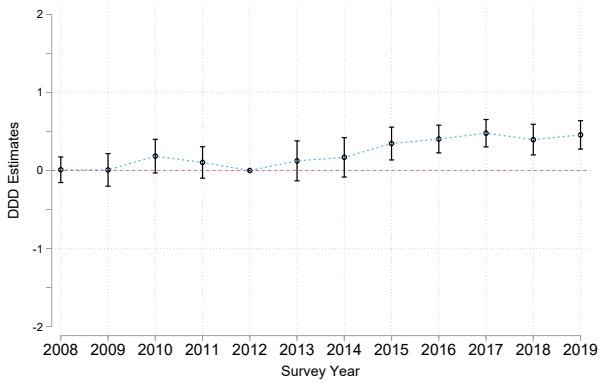
This figure plots the Poisson Conditional Fixed Effects estimates for Equation (5), where time is either Survey Year or Marriage Year. The sample is restricted to men only. Standard errors are clustered at the group-state level.

13 Urban Heterogeneity

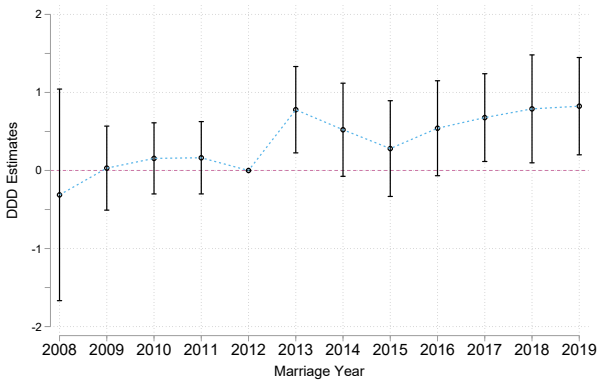
Table A22: Heterogeneity by Urbanicity - DDD Estimates Restricted by Metro Area

	Coupled Rate Per Adult		Marrying Rate Per Adult Per Year	
	In Metro	Not In Metro	In Metro	Not In Metro
post × M × SS	0.296	0.660	0.606	0.005
	(0.053)	(0.248)	(0.194)	(0.213)
post × SS	0.341	0.425	1.358	1.557
	(0.021)	(0.057)	(0.159)	(0.134)
post × M	0.055	0.025	-0.004	-0.043
	(0.018)	(0.059)	(0.017)	(0.029)
Observations	2,388	2,328	2,376	2,232
Log Likelihood	-2,164,843	-3,122,633	-12,103,267	-3,120,534
Relative IRR	1.344	1.936	1.832	1.005
SE	0.071	0.479	0.355	0.214
p-value	0.000	0.051	0.019	0.982
χ^2 Pre-Trend Test	5.177	7.343	1.912	5.438
p-value	0.270	0.119	0.752	0.245

This table reports the Poisson Conditional Fixed Effects estimates for Equation (3). SS refers to same-sex coupled individuals and M refers to mixed-citizenship coupled individuals. The coefficient of interest is post×SS×M and the Relative Incidence Rate Ratio (IRR) is the exponentiated coefficient of interest. The χ^2 pre-trend test reports the test statistic for the test of parallel pre-trends, described by Equation (6). Standard errors in parentheses, clustered at the group-state level.



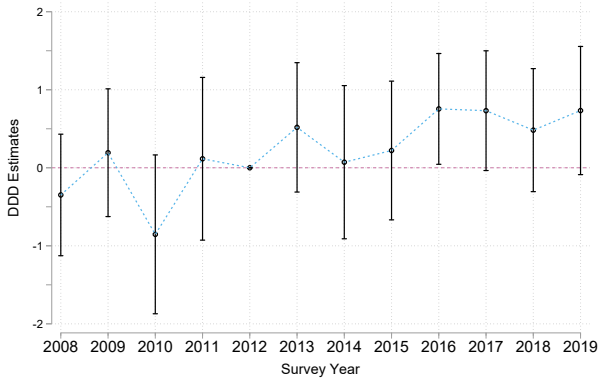
(a) Urban by Survey Year



(b) Urban Sample by Marriage Year

Figure A6: Event Study DDD Estimates for Urban Sample

This figure plots the Poisson Conditional Fixed Effects estimates for Equation (5), where time is either Survey Year or Marriage Year. The sample is restricted to those in metro areas only. Standard errors are clustered at the group-state level.



(a) Non-Urban by Survey Year

(b) Non-Urban Sample by Marriage Year

Figure A7: Event Study DDD Estimates for Non-Urban Sample

This figure plots the Poisson Conditional Fixed Effects estimates for Equation (5), where time is either Survey Year or Marriage Year. The sample is restricted to those not in metro areas only. Standard errors are clustered at the group-state level.

14 Naturalization

It is difficult to estimate the downstream effect of spousal visa access onto naturalizations because as same-sex marriages increase then, mechanically, the number of naturalized persons married to a same-sex partner increases. I attempt to shed light onto whether or not spousal visa access leads to naturalization by dividing couple according to whether or not a naturalization could be due to a spousal visa. That is, individuals possibly naturalized through marriage are naturalized after three years of marriage to a citizen and individuals not naturalized through marriage are either unmarried, married to a non-citizen, or married to a citizen for less than three years. Figure A8 plots the number of naturalizations by couple type. Four years after the jump in mixed-citizenship same-sex marriages, there is an increase in naturalizations possibly through same-sex marriage, while other naturalizations are relatively constant. This is consistent with non-citizens acquiring citizenship through marriage and through non-marital naturalization.

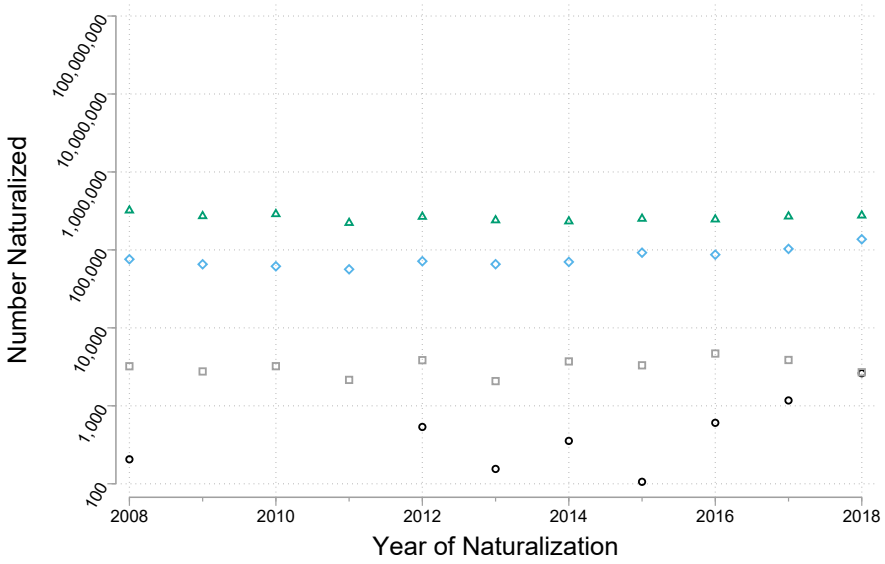
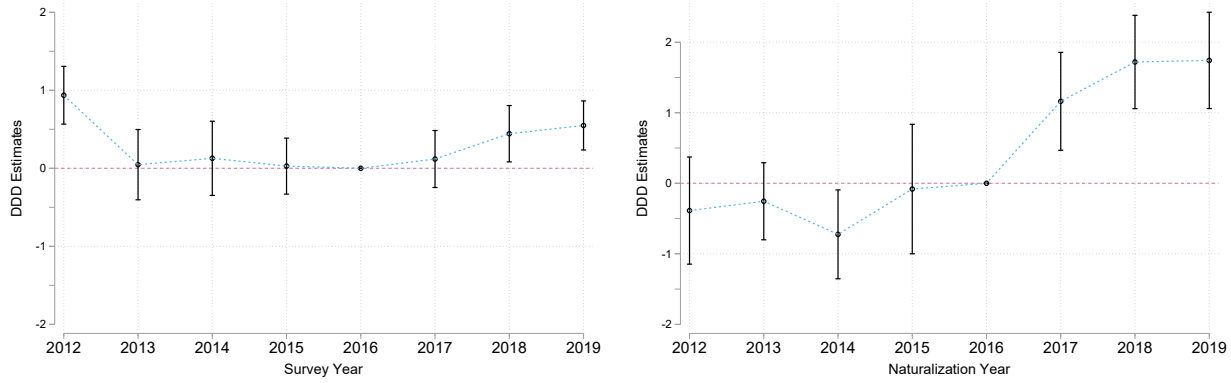


Figure A8: Number of Naturalized Individuals by Naturalization Year

Each point represents the number of individuals in a given couple type by naturalization year, representative of the United States population in 2019. The vertical axis depicts the number of naturalized individuals on a logarithmic scale. The horizontal axis depicts the year in which a partner is naturalized. The four couple types are determined by the intersection of same- or different-sex and possibly naturalized through marriage or not naturalized through marriage. Possible naturalization through marriage means a naturalized individual married a citizen three or more years before naturalization. Not naturalized through marriage means a naturalized individual is unmarried or married to a citizen for less than three years.



(a) Individuals by Survey Year **(b) Naturalizations by Nat Year**

Figure A9: Event Study DDD Estimates for Naturalized Individuals

This figure plots the Poisson Conditional Fixed Effects estimates for Equation (5), where time is either Survey Year or Naturalization Year. The sample is restricted to naturalized individuals only. Standard errors are clustered at the group-state level.

Table A23: DDD Estimates for Naturalized Coupled Individuals

	Naturalized Coupled Individuals	
	by Survey Year (Stock)	by Naturalization Year (Flow)
post × A × SS	0.155	1.722
	(0.119)	(0.200)
post × SS	0.296	-0.005
	(0.048)	(0.127)
post × A	0.046	0.247
	(0.028)	(0.027)
Observations	1,536	1,416
Log Likelihood	-195,348	-737,261
Relative IRR	1.167	5.595
SE	0.139	1.117
p-value	0.228	0.000
χ^2 Pre-Trend Test	29.571	7.003
p-value	0.000	0.136

This table reports estimates for the relationship between access to federal marriage benefits for same-sex couples and naturalizations possibly resulting from same-sex marriage. Possible naturalization through marriage (PNTM) means a naturalized individual married a citizen three or more years before naturalization. Not naturalized through marriage means a naturalized individual is unmarried or married to a citizen for less than three years. The relative incidence rate ratio (IRR) is the exponentiated coefficient of interest. The χ^2 statistic is for a test of parallel pre-trends. Standard errors are clustered at the group-state level.

15 Main Result without Non-Citizen Same-Citizenship Couples

Table A24: DDD Estimates for the Main Specification where Same-Citizenship Couples are both Citizens

	Coupled Rate Per Adult	Marrying Rate Per Adult Per Year
post × M × SS	0.301	0.550
	(0.053)	(0.183)
post × SS	0.370	1.374
	(0.018)	(0.158)
post × M	0.078	-0.026
	(0.015)	(0.015)
Observations	2,448	2,436
Log Likelihood	-651,825	-13,643,317
Relative IRR	1.351	1.733
SE	0.072	0.317
p-value	0.000	0.021
χ^2 Pre-Trend Test	2.830	0.502
p-value	0.587	0.973

This table reports the Poisson Conditional Fixed Effects estimates for Equation (3). SS refers to same-sex coupled individuals and M refers to mixed-citizenship coupled individuals. The coefficient of interest is post×SS×M and the Relative Incidence Rate Ratio (IRR) is the exponentiated coefficient of interest. The χ^2 pre-trend test reports the test statistic for the test of parallel pre-trends, described by Equation (6). Standard errors in parentheses, clustered at the group-state level.

16 Difference-in-Difference Results and Results from Non-Citizens Only

Table A25: DD and DDD Estimates for Entire Sample and Non-Citizen Sample

	Coupled Rate			Non-Citizen Coupled Rate		
	ΔΔ SS only	ΔΔ M only	ΔΔΔ	ΔΔ SS only	ΔΔ M only	ΔΔΔ
post × M × SS			0.304			0.318
			(0.053)			(0.097)
post × SS		0.670	0.367		0.680	0.362
		(0.050)	(0.018)		(0.050)	(0.083)
post × M	0.378		0.074	0.347		0.029
	(0.051)		(0.015)	(0.094)		(0.024)
Observations	1,224	1,224	2,448	1,176	1,224	2,400
Log Likelihood	-241,964	-240,497	-666,781	-132,583	-125,105	-418,621
Relative IRR	1.459	1.955	1.355	1.414	1.974	1.374
SE	0.074	0.098	0.072	0.133	0.099	0.133
p-value	0.000	0.000	0.000	0.002	0.000	0.005
χ^2 RESET Test	1.236	1.759	2.764	1.284	3.047	1.134
p-value	0.539	0.415	0.251	0.526	0.218	0.567
χ^2 Pre-Trend Test	5.647	6.995	3.174	11.255	5.894	11.979
p-value	0.227	0.136	0.529	0.024	0.207	0.018

This table reports the Poisson Conditional Fixed Effects estimates for Equation (3). SS refers to same-sex coupled individuals and M refers to mixed-citizenship coupled individuals. The coefficient of interest is post×SS×M and the Relative Incidence Rate Ratio (IRR) is the exponentiated coefficient of interest. The χ^2 pre-trend test reports the test statistic for the test of parallel pre-trends, described by Equation (6). Standard errors in parentheses, clustered at the group-state level.

Table A26: DD and DDD Estimates for Entire Sample and Non-Citizen Sample

	Marriage Rate			Non-Citizen Marriage Rate		
	ΔΔ SS only	ΔΔ M only	ΔΔΔ	ΔΔ SS only	ΔΔ M only	ΔΔΔ
post × M × SS			0.540			0.719
			(0.179)			(0.165)
post × SS		1.923	1.383		1.951	1.232
		(0.093)	(0.153)		(0.090)	(0.139)
post × M	0.532		-0.008	0.883		0.163
	(0.178)		(0.015)	(0.164)		(0.016)
Observations	1,212	1,212	2,436	1,032	1,212	2,256
Log Likelihood	-1,266,248	-1,844,300	-14,930,592	-127,910	-938,519	-2,470,639
Relative IRR	1.702	6.845	1.716	2.417	7.037	2.053
SE	0.303	0.636	0.307	0.397	0.631	0.339
p-value	0.021	0.000	0.020	0.000	0.000	0.002
χ^2 RESET Test	21.094	1.534	3.167	0.507	1.217	3.903
p-value	0.000	0.464	0.205	0.776	0.544	0.142
χ^2 Pre-Trend Test	0.695	15.038	0.457	2.263	15.340	1.535
p-value	0.952	0.005	0.978	0.688	0.004	0.820

This table reports the Poisson Conditional Fixed Effects estimates for Equation (3). SS refers to same-sex coupled individuals and M refers to mixed-citizenship coupled individuals. The coefficient of interest is post×SS×M and the Relative Incidence Rate Ratio (IRR) is the exponentiated coefficient of interest. The χ^2 pre-trend test reports the test statistic for the test of parallel pre-trends, described by Equation (6). Standard errors in parentheses, clustered at the group-state level.