The effect of same-sex marriage legalization on interstate migration in the United States

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ABSTRACT

This paper analyzes the impact of marriage regulations on the migratory behavior of individuals using the history of the liberalization of same-sex marriage across the United States. The legalization of same-sex marriage allows homosexuals access to legal rights and social benefits, which can make marriage more attractive in comparison to singlehood or other forms of partnership. The results clearly show that legalization increased the migration flow of gay men to states that legalized same-sex marriage. We do not detect statistically significant effects for women in the short term. Supplemental analysis, developed to explore whether the migration flow translated to a significant effect on the number of homosexuals by state, suggests that the increase after the legalization of same-sex marriage was transitory. Legalization of same-sex marriage also reduces the incentives for non-U.S.-native individuals originating from intolerant countries to move to a state that permits same-sex marriage.

Keywords: homosexuals, marriage, migration

JEL Codes: J12, J15, Z13

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Acknowledgments: This research has been funded by the Regional Government of Aragon and the European Fund of Regional Development (Grant S32_20R). This article has benefited from comments provided by Professor Klaus F. Zimmermann and five anonymous referees.

1. INTRODUCTION

The location choice of homosexuals (gays and lesbians) has been partly analyzed in the economic literature on homosexual behavior (Black et al., 2007). Studies using urban economic models suggest that the geographic distribution of homosexuals depends on the access to amenities (Black et al., 2002, 2007). However, other factors can also play a role (Vossen et al., 2019). Most of the dramatic changes related to homosexuals during the last two decades around the world were legal changes (ILGA World, 2019). One major recent policy change has been the legalization of same-sex marriage, which has been introduced in 29 of the 195 countries in the world (ILGA World, 2019; national legislations). In the U.S., the Supreme Judicial Court of Massachusetts ruled in 2003 that the ban on same-sex marriage was unconstitutional (Goodridge v. Department of Public Health, 2003). This touched off a progressive increase in the number of states legalizing same-sex marriage until 2015, when the U.S. Supreme Court ruling (Obergefell v. Hodges, 2015) opened this form of partnership to the rest of the country. This study examines whether the legalization of same-sex marriage in the U.S. had an impact on the migratory behavior of homosexuals.[1]

Access to marriage can motivate people to move. Marriage allows individuals access to more citizenship rights, welfare benefits, tax benefits, health care, social, property, and parental rights than any other form of partnership in the U.S. For example, homosexuals cannot be covered by their partner's employer-provided health insurance, and non-married couples cannot file taxes jointly in the U.S. (see an extensive review in Badgett, 2009). The gains derived from marriage are not limited to economic and welfare benefits and legal rights; researchers suggest that marriage may help homosexuals to gain recognition and support (Ocobock, 2013). From a theoretical point of view, the Beckerian framework (Becker, 1973; Black et al., 2007) may be applicable. In this setting, individuals choose to marry when their expected lifetime utility derived from marriage exceeds their expected utility from remaining single. Thus, those states where same-sex marriage is legal would be a potentially attractive place of residence for those homosexuals whose expected utility in marriage exceeds that of remaining single.

Differences across states or even counties in terms of public policies and legislation affect the migration behavior of individuals in the U.S. (e.g., Gelbach, 2004; Gius, 2011; McKinnish, 2005, 2007; Fiva, 2009). The literature studying the impact of same-sex

[1] The term *homosexual* refers to gays and lesbians in this study.

marriage on mobility is quite scarce. Pinello (2016) conducted a comprehensive survey of the effects of same-sex marriage legalization on gay and lesbian couples across six states in the U.S., and Beaudin (2017), using micro-level data, suggested that heads of households in both different- and same-sex relationships were more likely to leave states where same-sex marriage was not legal. She also suggested that same-sex marriage could be increasing the imbalanced geographic distribution of same- and different-sex couples across the U.S. Further research is necessary to analyze the effects of same-sex marriage legalization on the mobility of homosexuals.

A growing literature analyzes the effect of same-sex marriage legalization on different socioeconomic and demographic variables. Langbein and Yost (2009) explored whether the legal recognition of same-sex marriage has had an adverse impact on outcomes related to traditional family values, and found that it did not have a negative effect. Hatzenbuehler et al. (2012) studied the effect of the enactment of same-sex marriage legislation in Massachusetts on health care use and expenditures among gay and bisexual men, and Francis et al. (2012) analyzed the relationship between same-marriage laws and sexually transmitted infections. Using a difference-in-difference strategy, Dillender (2014) examined how changes in U.S. legal recognition allowing same-sex couples to marry have altered marriage rates in the U.S., and Trandafir (2015) studied the effect on marriage, divorce, and extramarital births in OECD countries, finding positive effects on family formation. More recently, Hansen et al. (2020) explored the effects of same-sex marriage on the labor supply and reveal mixed results (i.e., no effect on gay men and a negative effect on lesbian women). Hamermesh and Delhommer (2020) determined that same-sex couples' income and their likelihood of home ownership increased with the partnerships' duration only when/where same-sex marriage was legal. They pointed to greater legal protection as an incentive in same-sex couple relationships.

This study supplements previous literature by firstly analyzing the dynamic response of homosexual migration to same-sex marriage legalization, which allows us to study whether the effect was observed after its legalization. To do this, we constructed a panel representing the 50 U.S. states and the District of Columbia covering the period 2001 to 2015. We used data from the American Community Survey of the Integrated Public Use Microdata Series (IPUMS) (Ruggles et al., 2018) to analyze the effect of the legalization of same-sex marriage on homosexuals moving between states. From that dataset, we only observed the behavior of those gay men and lesbian women who are cohabiting, as in the prior literature (Black et al., 2007; Negrusa and Oreffice, 2011;

Hansen et al., 2020). We identified the relationship between the migration flow of homosexuals and same-sex marriage by using the legislative history of the liberalization of same-sex marriage across the United States.

Our results suggest that the legalization of same-sex marriage increased the percentage of gays who moved to a state allowing same-sex marriage; however, we do not find a statistically significant effect among lesbians. All of our regressions account for unobservable state-specific factors by including state-fixed effects as well as time-varying characteristics by adding year-fixed effects. These results are robust to controlling for observable characteristics at the state level, which can vary over time. We provide additional evidence suggesting that our results are not driven by other legislative changes related to discrimination based on gender identity in adoption, employment, housing and public accommodation, gender marker changes on birth certificates, the repeal of sodomy laws, and the approval of civil unions or domestic partnerships. This is in line with Hamermesh and Delhommer (2020), who suggested that only the legal protection of marriage matters in some homosexual decisions, but not the availability of other non-discrimination measures, such as the access to civil unions or domestic partnerships.

We add to the literature, secondly, by studying whether the relationship between same-sex marriage legalization and homosexual migration varies after controlling for distance–related costs of migrating. This can be important in this framework because the legalization of same-sex marriage was phased in and not all gays and lesbians had a nearby state that allowed same-sex marriage. Two different costs can be distinguished here: the costs of starting a "new" life in a different place (which may include finding a new job, a house, shops, doctors, etc.) and the psychological cost of reducing contact with friends/family. All interstate moves involve paying the "new" life costs, but this is not the case with the psychological costs that are more likely to vary with distance. However, it is not only the long trips that may matter but also the access to transportation that can allow individuals to easily travel to other places.[2]

Another unexplored issue related to the effect of same-sex marriage is how this can affect the number of homosexuals (stock) as a result of the migration flow of homosexuals to states that had legalized same-sex marriage. As previously mentioned, Beaudin (2017), without showing empirical evidence, pointed out the possibility that the phased

[2] We want to thank a referee for this interesting suggestion.

legalization of same-sex marriage across the U.S. could be changing the spatial distribution of homosexuals by increasing the number of homosexuals to those states introducing the same-sex marriage. Note that, since we are considering individuals in same-sex couples, that legalization could increase cohabitation/marriage among state residents in addition to migration. We can check this by focusing on the analysis of the dynamic response of homosexuals to the liberalization of same-sex marriage. Thus, our work is not limited to the exploration of the migration flow of homosexuals; we also pay attention to the evolution of the number of homosexuals by state, which is our third contribution to the literature. We found that there was an impact on the number of homosexuals after the legalization of same-sex marriage, but this impact was transitory. We detect no empirical evidence in favor of a change in the geographic distribution of homosexuals as a consequence of same-sex marriage. The observed effect on mobility does not appear to translate to the spatial distribution of homosexuals as time passes.

To our knowledge, there is also a lack of research relating to how the legalization of same-sex marriage affects individuals originating from countries that are not tolerant of same-sex relations. On the one hand, states with same-sex marriage may be more attractive for those individuals who flee persecution because of the criminalization of same-sex relations in their country of origin. One way to examine this issue is to explore data on asylum seekers by type of persecution (including gender identity and sexual orientation). Unfortunately, as is explained by the Center for Gender & Refugee Studies in 2020, the absence of official reporting on asylum cases at most stages of adjudication makes this analysis impossible. On the other hand, states with same-sex marriage are dissimilar to intolerant countries in terms of sexual orientation, reducing the incentives to live in those states for individuals originating from intolerant countries. We found empirical evidence that appears to confirm this behavior, which is our fourth contribution to the existing literature. The percentage of individuals from countries that criminalize same-sex relations decreased in states with same-sex marriage.

The remainder of the paper is organized as follows. Section 2 presents the empirical strategy, while Section 3 describes the data. Our results are discussed in Section 4, and Section 5 offers a conclusion.

2. EMPIRICAL STRATEGY

To identify the effects of same-sex marriage on the interstate migration of individuals, our empirical approach makes use of the variations in the timing of the legalization of same-sex marriage across the U.S. The use of the history of legalization of same-sex marriage allows us to analyze the causal link between same-sex marriage and the migration behavior of individuals.[3] We follow Wolfers's methodology (Wolfers, 2006) to determine the dynamic effect of same-sex marriage legalization. Formally, we estimate:

$$PHM_{ct} = \Sigma_s \beta_s legalization_{cts} + \Sigma_c StateFE_c + \Sigma_t YearFE_t + u_{ct} \qquad (1)$$

where PHM_{ct} is the percentage of homosexuals who move to state *c* in the year *t*. This variable is defined as the number of homosexual migrants over the total homosexuals *at risk* of migrating multiplied by 100. In the denominator, the individuals *at risk* of migrating incorporate all identifiable homosexuals living in the rest of the states in year *t*, excluding those living in state *c* in year *t*. Our main explanatory variable, $legalization_{cts}$, is a dummy variable that takes value *1* when state *c* has legal same-sex marriage in year *t* for *s* period, and *0* otherwise. In this way, equation (1) includes dummies showing whether same-sex marriage has been effective for 1-2 years, 3-4 years, and so on. As explained above, access to marriage (which implies legal rights and social benefits) may alone be sufficient to encourage homosexual migration. In this setting, we would expect β_s parameters to be positive indicating that the inflow migration of homosexuals to state *c* has increased by β_s percentage points after *s* periods since the legalization of same-sex marriage. The interpretation of a negative sign would mean just the opposite. We include state- and year-fixed effects in equation (1) to account for evolving unobserved attributes varying at the state level and over time. Regressions are estimated by population-weighted least squares.[4]

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[3] Using methodologies quite similar to that presented here, we have found several papers that examine the role of law reforms on different outcomes. For example, some researchers focus their attention on the impact of divorce law reforms on divorce rates (Wolfers, 2006; González-Val and Marcén, 2012), fertility rates (Bellido and Marcén, 2014), marriage rates (Drewianka, 2008), and suicide and domestic violence (Stevenson and Wolfers, 2006). Other papers have considered the effect of custody law reforms on marriage rates and fertility rates (Halla, 2013), economic well-being (Del Boca and Ribero, 1998; Allen et al., 2011), and educational attainment (Leo, 2008; Nunley and Seals, 2011). In all these cases, the empirical approach is based on the exogeneity of the law reforms. We revisit this issue below.

[4] We obtain similar results when accounting for pre-existing differences across states incorporating the interaction between the state-fixed effects and calendar and quadratic calendar time (see Table 2). Results

This methodology allows us to analyze the dynamic response of the homosexual migration flow to changes in marriage access (dynamic model). Prior literature is limited to the exploration of how same-sex marriage may affect the probability of homosexual and heterosexual couple migration using microdata (Beaudin, 2017). In our case, we use aggregate data to examine how same-sex marriage affects the evolution of homosexual migration flow. To examine the possible differences between gay men and lesbian women, we ran the entire analysis separating the sample between both group of individuals. The rest of our work also applies a similar empirical strategy to that presented in this section (see below for a detailed explanation) to examine the importance of the distance-related costs on the migration process, the possible impact on the number of homosexuals (stock), and the migration process of those individuals originating from intolerant countries regarding same-sex relations.

3. DATA

The dataset used in this work covers the 50 states of the U.S. and the District of Columbia from 2001 to 2015. The migration flow of individuals is calculated by using data from the American Community Survey (ACS) of Integrated Public Use Microdata Series (IPUMS, Ruggles et al., 2018). The ACS provides information on the state of residence during the previous year. This allows us to calculate the number of individuals who have moved from one state to another in the previous year. To identify whether an individual is homosexual, we are only capable of observing those men and women living with a partner of the same-sex in the ACS sample.[5] This data limitation is common in other studies (Black et al., 2007; Negrusa and Oreffice, 2011; Hansen et al., 2020, among others).[6] Our sample selection consists of homosexuals aged 30 (beyond the education period and after the period of more intense job mobility (Bureau of Labor and Statistics, 2018; Borghans and Golsteyn, 2012)) to 64 (below retirement age) who can legally marry (single, divorcee, or widower).

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do not vary with/without weights. The intuition behind using weighted least squares is that a positive effect of same-sex marriage legalization in say, California, will carry more weight than a positive effect in New Hampshire (Friedberg, 1998).

[5] We omitted respondents for whom sex was allocated by the data administrators to avoid erroneous classification of same-sex households (Hansen et al., 2020).

[6] Not all individuals in the LGBT community are included in the data since we can only identify couples where both individuals are male, or both are identified as female from the ACS. These data consider only a subset of individuals in the LGBT community. We recognize that this is an inherent problem when analyzing same-sex individuals.

With respect to our variable of interest, we obtained information on same-sex marriage from Gerstmann (2017). As mentioned above, the legalization of same-sex marriage in the U.S. began in 2003, when Massachusetts legally recognized same-sex marriage.[7] Between 2008 and 2009 four more states (Connecticut, Iowa, New Hampshire, and Vermont) and the District of Columbia followed. By 2015, the legalization of homosexual marriage had already been established in 37 states (Alabama, Alaska, Arizona, California, Colorado, Delaware, Florida, Hawaii, Idaho, Illinois, Indiana, Kansas, Maine, Maryland, Minnesota, Montana, Nevada, New Jersey, New Mexico, New York, North Carolina, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, Utah, Virginia, Washington, West Virginia, Wisconsin, Wyoming, and the five states mentioned above) and District of Columbia. Since 2015, all states have allowed same-sex marriage (see Figure 1).

As seen in Figure 2, the percentage of U.S. people living in a state having same-sex marriage was below 10% until 2012 when it rose to almost 20%. Subsequently, a considerable increase was observed until 2015 when 100% of the population lived in a state allowing same-sex marriage. This figure also shows the evolution of the migration flow of homosexuals. We have represented the percentage of homosexual migrants (considering all states), as the number of homosexual migrants over the total number of homosexuals *at risk* of migrating from 2001 to 2015. It is observed that the rise in homosexual migration took off since 2011, but this is not so clear in the previous years. Figure 3 provides additional evidence in favor of the possible relationship between the homosexual migration and same-sex marriage legalization, since the number of homosexuals aged 30-64 moving to states without access to same-sex marriage decreased considerably after 2006, whereas the number of homosexuals moving to states with access to same-sex marriage slightly increased after 2003 and took off after 2008. Thus, it is not the migration flow to states without same-sex marriage that is driving the behavior of the homosexual migration. Of course, this is not a conclusive analysis and we need to test it more thoroughly.

[7] We did not consider the effective date of the legislation since the announcement of the legalization of same-sex marriage can also attract homosexuals. Note that we are using annual data, so the differences between the effective date and the date used here are not likely to have an impact on our dataset. In any case, our results are robust to the use of the timing of the effective date of the law instead of using the announcement date. Results are presented in the Appendix, Table A3.

4. RESULTS

a) Same-sex marriage and migration flow of homosexuals

Table 1 reports our estimates on the effect of same-sex marriage on the migration flow of homosexuals. The first column, which includes state- and year-fixed effects, shows an increase in the percentage of homosexual migrants in the years following the legalization of same-sex marriage. In the other columns, we have separated the sample by gender.[8] This is necessary, since our estimated coefficients may be capturing the responses from gay men in addition to/instead of the responses from lesbian women. This argument is based on the idea that there can be differences between female and male migration because of possible dissimilarities in the factors affecting migration decisions by gender (Enchautegui, 1997). Column 2 incorporates as the dependent variable the percentage of gay men, whereas Column 3 includes the percentage of lesbian women. Estimations indicate clear gender differences. A positive and statistically significant effect is found in all years subsequent to the legalization of same-sex marriage for gay men. However, this effect is only significant (only at a 10% level) seven years after the legalization of same-sex marriage for lesbian women.[9] It is worth noting that the effect of same-sex marriage is sizable, representing almost half (0.027) of the mean of the percentage of gay migrants (0.06) and almost doubling that mean more than seven years after the legalization of same-sex marriage.[10]

It is possible that unobservable factors such as culture or demographic trends evolve over time at different paces in different states. For example, in one state, it may be more socially acceptable to have a same-sex partner, while in others it may be less so. Those

[8] The variation in sample size is due to the fact that in some states all homosexuals identified in some years are gay or lesbian. North Dakota only has gay migrants in some years but not lesbian. Alaska, North Dakota, South Dakota, Vermont and Wyoming only have lesbian migrants but not gay migrants in some years. Our results are maintained without those states and years in which there is no observations in the microdata about lesbian women or gay men, (see Column 1 of Table A2 in the Appendix). This can be consequence of a problem of identification of gay/lesbian individuals in some specific state-years because the sample size is quite small in some cases. We prefer to be conservative and run the analysis without the information of those state-years when separating the sample by gender. In any case, we only lost five observations in the gay sample and two in the lesbian sample. Results are maintained if we consider no gay/lesbian migrants in those state-years. We have also run the analysis filling those gaps with linear interpolation and results are maintained (see Columns 2 and 3 of Table A2 in the Appendix).

[9] Note that there is evidence of this in the U.S., Italy, the UK, and the Netherlands, among others (Plug et al., 2004; Patacchini et al. 2014; Drydakis, 2019), but not for Greece, which observed a negative effect of lesbian sexual orientation on labor outcomes (Drydakis, 2011).

[10] Note that our findings are limited to the use of a sample that only includes individuals living in a same-sex relationship. We recognize that the number of unmarried couples identified in those states without same-sex marriage can be underestimated since homosexuals can be more likely to be living apart to reduce stigma in. This could bias our estimates.

states with a higher social norm associated with homosexual couples would experience higher increases in the percentage of homosexuals moving in and might also be more likely to introduce same-sex marriage. Adding state-specific linear and quadratic trends can capture these issues.[11] Columns 1 and 2 of Table 2 presents these results.[12] As seen, a statistically significant effect at 1% level is found in all years subsequent to the legalization of same-sex marriage for gay men and this effect is now detected five to six years after the legalization of same-sex marriage for lesbian women. Our results are also maintained after clustering the standard errors at a state level in Columns 3 and 4.

Although all our previous specifications incorporated controls for unobservable characteristics that can vary at the state level and/or over time, we ran additional regressions to check whether the findings were driven by omitted economic and/or demographic variables. The impact of these omitted variables, if correlated with the outcome of interest, could be captured by the coefficients measuring the effect of same-sex marriage legalization. To tackle this issue, we added more controls to our baseline regression. Since the characteristics of the individuals (e.g., race, education) living in a state can make it more or less attractive to the individuals living in the rest of the country, we have added controls by state and year for the proportion of individuals by race (white and black), education (the proportion of people who had completed high school, one to three years of college, and four or more years of college) and the proportion of individuals by type of industry in which individuals worked. The economic situation of the potential state of residence may also affect migration decisions, and for this reason we added the employment rate by state and year. After adding these variables in Columns 5 and 6 of Table 2, the dynamic response of gays and lesbians to the legalization of same-sex

[11] We provided additional evidence that pre-existing trends on homosexual migration are not driving our results by including a dummy variable which takes the value 1 during the periods -1 and -2, that is, 1 and 2 years prior to the legalization of the same-sex marriage. Results are reported in Table A3 in the Appendix where it is observed that the pre-same-sex marriage coefficient is not statistically significant. Thus, it appears that our results are not simply the continuation of prior patterns. We also re-ran our main analysis by limiting the sample to those states that legalized same-sex marriage via a judicial decision (Hansen et al., 2020), since this implementation may be less likely to be predicted. Note that these results should be taken with caution due to the scarcity of observations after this limitation of the sample. In any case, we find evidence of a positive and significant impact on the migration of gay men, which is in line with all our findings.

[12] Note that the scarcity of observations can generate concerns on the validity of our estimates after the inclusion of all these additional controls. For this reason, the analysis is presented without those state-specific trends.

marriage is quite similar although the estimated coefficient on the impact of same-sex marriage 1-2 years after its legalization appears to be more imprecisely estimated.[13]

To reinforce the consistency of previous results, we estimated supplementary analysis using different samples and redefining the dependent variable. Results are reported in Table 3. We first redefined the sample of homosexuals including not only those individuals who can legally marry but also married homosexuals.[14] The observed effect of same-sex marriage on the migration flow of those who could legally marry could be due to a change in the population at risk of marrying, since it can be assumed that fewer homosexuals could legally marry after the legalization of same-sex marriage (some of them had access to marriage). Columns 1 and 2 report our results by gender. As both columns show, our conclusions are maintained, and the coefficients do not change in regard to married homosexuals. We tested our findings considering a young sample since younger individuals can have different incentives to change their place of residence than older individuals. Results are displayed in Columns 3 and 4 for a sample of individuals aged 25 to 55 years old. We found that the effect of same-sex marriage is positive and statistically significant three to four years after its legalization for gay men, and the magnitude of the effect with respect to the mean is quite similar to that presented in Table 1.[15] As before, no statistically significant coefficients were detected for lesbian women.

The migration process in the U.S. is not limited to interstate migration; international migration might be affected by the legalization of same-sex marriage. We extended the sample by adding those living in another country in the previous year in Columns 5 and 6 of Table 3. Results changed very little. In addition, we repeated the analysis by excluding the non-native population, since several studies have shown differences between non-native and native individuals in interstate migration. Rogers and Raymer (1998) found that the migration patterns of the foreign-born, in general, exhibited levels of spatial focus that exceeded those of their native-born counterparts. Gurak and Kritz (2000) indicated that while human capital factors were the most important sources of differences between immigrants and natives in internal migration patterns, contextual dimensions associated with the social capital of native groups and state economic

[13] We have re-run these specifications including each of these additional controls separately, and the results did not vary.

[14] Note that all same-sex couples who reported being married were recoded to unmarried cohabiting partners until 2013. Thus, the addition of married individuals to the sample only captured married individuals from 2013 to 2015 (https://usa.ipums.org/usa-action/variables/MARST#editing_procedure_section).

[15] The coefficient picking up the effect 1-2 years is positive and different from zero although non-statistically significant, which may indicate that this is more imprecisely estimated.

conditions strongly influenced the interstate migration of immigrants. We repeated our main analysis including only those homosexuals originating from the U.S. (see Columns 7 and 8). Results were unchanged, and, therefore, the behavior of non-native individuals did not appear to affect to our findings. It is possible that the behavior of non-native individuals differs depending on their country of origin, since there are considerable differences in the way same-sex relationships are considered throughout the world. We revisited this issue below when we explored the behavior of non-native individuals originating from intolerant countries (where same-sex relationships are illegal).

It can be argued that the decision to move from one state to another depends on the laws in both states, host, and home state.[16] As an additional robustness check, we redefined our dependent variable as the percentage of homosexuals who move to state *c* from another state, where same-sex marriage was not legalized in the year *t.* Results are shown in Columns 9 and 10. As can be seen, the positive and statistical significant effect is detected in almost all years following the legalization for gay men. In line with the previous results, no statistically significant effect was found among lesbian women.

In short, all the results described in this section suggest that the legalization of same-sex marriage positively affects the migration flow of homosexuals to those states that have same-sex marriage, but this response appears to be consequence of the behavior of gay men.

b) Is it the effect of same-sex marriage, or is it the effect of other regulations?

Same-sex marriage legalization was accompanied by related legal changes that may have affected the interstate migration of lesbian, gay, bisexual, and trans (LGBT) people (see Table A1 in the Appendix). Since the time of these legal changes varies by state, it could be possible that our estimated coefficient capturing the effect of same-sex marriage might include the effects of other antidiscrimination legislations.

By 2019, only seven states and the District of Columbia had passed regulations that banned the discrimination based on gender identity in adoption. Since the 1990s, regulations have been introduced prohibiting discrimination based on gender identity in employment, housing, and/or public accommodations. By 2019, 21 states and the District of Columbia had such laws (Movement Advancement Project, 2019). Similarly, policies

[16] Unfortunately, we cannot re-run the analysis considering migration between each pair of states due to the scarcity of observations to obtain reliable estimations.

for changing gender markers on birth certificates vary from state to state. By 2019, 22 states and the District of Columbia had issued new style birth certificates with new gender markers (Movement Advancement Project, 2019). Since the 1970s, some states have repealed their sodomy laws. These laws made certain kinds of sexual activity illegal. By 2003, 36 states and the District of Columbia had repealed them (Kane, 2003). Since the late 1990s, other marriage alternatives, such as civil unions and domestic partnerships were allowed (Hansen et al. 2020). We need to control for this issue to mitigate concerns as to whether our estimations are capturing the effect of same-sex marriage rather than other differences in LGBT legislation across states.

To capture the impact of all LGBT-related legislation mentioned above, we used variation in the timing of these reforms by adding explanatory variables to control for the years since each law was adopted.[17] None of the prior literature considers this legislation in its totality, so with regard to previous research on the impact of same-sex marriage on socio-economic and demographic variables, there can be some concerns about what exactly is being picked up by the estimated coefficients on same-sex marriage legalization. Table 4 shows the dynamic response of interstate homosexual migration to same-sex marriage legalization, after controlling for the prohibition of discrimination based on gender identity in adoption; employment, housing or public accommodation; the approval of gender marker changes on birth certificates; the introduction of the repeal of sodomy laws; and the legalization of marriage alternatives. As can be seen, the reform allowing gender marker changes on birth certificates is the only one which appears to play a significant role in the migration flow of gay men. It is reassuring to observe that, even after adding those controls, we found an effect of the same-sex marriage legislation, which suggests that it was not the LGBT-related legal changes that were driving our findings. It, therefore, appears that same-sex marriage does play a role in the migration flow of homosexuals. Our results are in line with those of Hamermesh and Delhommer (2020), who suggest that only the greater legal protection of marriage matters in partnership decisions among homosexual individuals, not the availability of other non-discrimination measures, such as access to civil unions or domestic partnerships.

[17] Results on the impact of these legislations should be taken with caution, since in some cases the dates of the reforms are quite close and even coincide. In any case, we have repeated the analysis including each legislation at a time and our results have not changed substantially. We recognize that the estimated coefficients after five to six years of same-sex marriage legalization appear to be more imprecisely estimated, albeit positive.

c) Distance-related costs

Up to this point, we have focused on the relationship between same-sex marriage legalization and interstate homosexual migration. In this section, we examine whether that relationship varies when controlling for distance-related costs. Prior research has shown that among the variables affecting the costs of migration, the distance between destination and origin appears to be one of the most important factors: the further away the two places are, the higher the monetary travel costs for the initial move, as well as for visits back home (Long et al., 1988; Mayda, 2010). Another explanation as to why distance may negatively affect migration is that it is costlier to acquire information about distant locations (Greenwood, 1997; Lucas, 2001). The literature on this subject offers a consensus on the effect of distance on migration (Davies et al., 2001). Even if the migration pattern of homosexuals were different than their heterosexual counterparts, it would not be surprising to observe that the greater the physical distance, the lower the incentives to migrate.[18]

Our analysis here is concentrated in controlling for the possible distance-related costs. There can be two different distance-related costs: the costs of starting a "new" life in a different place (which may include finding a new job, a house, shops, doctors, etc.) and the psychological cost of reducing contact with friends/family. All interstate moves would involve paying the "new" life costs, but this is not the case with the psychological costs that are more likely to vary with distance. Focusing on the latter, it is not only the long trips that may matter, but also access to transportation that can allow individuals to easily travel to other places in order to reduce the psychological costs related to migration. To tackle this issue, we use the number of air passengers arriving to each state by year as a control. Data comes from the Bureau of Transportation Statistics. Those states with high flight availability would also be those receiving a high number of passengers and,

[18] Homosexuals appear to earn less than their heterosexual counterparts in the U.S. and in other countries (Ahmed and Hammarstedt, 2010; Badgett, 1995; Clain and Leppel, 2001; Grossbard and Jensen, 2008), generating budget constraints to move to a more distant state, because the greater the physical distance, the higher the migration costs (Belot and Hatton, 2012; Bellido and Marcén, 2015). Although this is mainly only observed for gay men (Drydakis, 2012) and not for lesbian women who are found to earn more than heterosexual women (Klawitter, 2015). However, the opposite could be possible. With low wages, opportunity costs would be lower for homosexuals, encouraging migration for homosexuals. Also, since homosexual households are less likely to have children, this reduces over a lifetime the necessities of some household resources (Black et al., 2002; Grossbard and Jensen, 2008), which can make them free in the migration process. Our preliminary results, controlling for the possible effect of physical distance, do not alter our findings. We do not include these here because, as suggested by a referee, this is not surprising.

therefore, those with low distance-related costs of migrating.[19] After including this control in Table 5, our estimations show a statistically significant effect even seven years after the legalization of same-sex marriage legislation for gay men. As previously, no significant effect was detected for lesbian women. The magnitude of the effect is quite similar to that obtained in Table 1 in all cases.

d) The effect of same-sex marriage legalization on the number of homosexual migrants (stock)

To our knowledge, there is only one study that explores the possible impact of same-sex marriage on migration decisions at the individual level (Beaudin, 2017). However, there are no studies of the possible effect of same-sex marriage on the geographical distribution of homosexuals across the U.S. Beaudin (2017) points to the possibility of an increasing imbalance in the distribution of homosexuals but does not provide empirical evidence. The draw data show in Figure 4 shows that during the period considered, there is a greater concentration of gays and lesbians in the West, Southwest, and Northeast regions of the U.S. than in others. Is this driven by the same-sex marriage legislation? In our research, we examined the impact of same-sex marriage on the number of homosexuals by state. Formally, we estimate this using the following equation:

$$Stock_{ct} = \Sigma_s \beta_s legalization_{cts} + \Sigma_c StateFE_c + \Sigma_t YearFE_t + u_{ct} \qquad (2)$$

where $Stock_{ct}$ is defined as the number of homosexuals living in state *c* in year *t* per 100 inhabitants. The rest of the variables have been defined previously. We would expect β_s parameters to be positive since the impact on the migration flow appears to be positive.[20] Table 6 presents the estimations. There appears to be empirical evidence in favor of an increase in the number of gay men following the legalization of same-sex marriage, but after five to six years, no significant coefficient has been detected. In the case of lesbians, all the previous analysis point to a non-significant effect in the migration flow. When we analyze the impact on the number of lesbian women, the estimated coefficients are

[19] We want to thank a referee for this interesting suggestion.

[20] Same-sex marriage can increase cohabitation/marriage among state residents in addition to migration. Therefore, these results cannot be completely attributed to the effect of migration. Note again that here we are considering a subset of individuals of the LGBT community: individuals in same-sex couples. We can only identify this subset in the ACS. According to the School of Law Williams Institute (UCLA), the total same-sex couples were 646,500 (1.3 million individuals) which represent around 0.4% of the US population in 2010 (https://williamsinstitute.law.ucla.edu/visualization/lgbt-stats/?topic=SS#density). This is quite close to the mean of the number of homosexuals obtained in our sample (0.42% for the entire period; see Table 6).

negative, although not statistically significant and quite close to zero in almost all cases. Thus, the positive effect on inflow migration is not translated to any significant degree into the number of homosexuals (stock), since after five to six years, there is no clear empirical evidence of a change in the geographical distribution of homosexuals as a consequence of same-sex marriage legalization.

e) The effect of same-sex marriage on non-native individuals originating from intolerant countries

There can be some specific individuals for whom the legalization of same-sex marriage in a state can reduce the attractiveness of moving there. States having same-sex marriage would perhaps unsurprisingly not be culturally similar to intolerant countries in terms of sexual orientation. This subsection will address this issue. It can also be argued that states with same-sex marriage would be more attractive for individuals who flee persecution because of the criminalization of same-sex relations in their country of origin. Unfortunately, this relationship cannot be examined since there is no available information. Data on asylum seekers by type of persecution (including gender identity and sexual orientation) is quite scarce (some data is available through the Center for Gender & Refugee Studies in 2020).

Focusing on the possible negative effects that cultural differences can generate, we calculated the percentage of non-native individuals originating from intolerant countries who moved from one state to another over the total number of non-native individuals originating from intolerant countries who are at risk of migrating (and multiplied by 100).[21] The sample selection of individuals is the same as before, that is, we have selected individuals between the ages of 30 and 64 who can legally marry. The intolerant countries of origin are classified in accordance with the information provided by the ILGA in 2019. As observed in Table 7, our estimations suggest that same-sex marriage reduces the incentive for non-native individuals originating from intolerant countries to move to a state that permits same-sex marriage. We find that the effect of same-sex marriage is negative and statistically significant one to four years after its legalization. This provides evidence that same-sex marriage can diminish the attractiveness of those places for individuals originating from less tolerant countries.

[21] Note that the pattern of homophobic behavior appears to persist over time across countries (Chang, 2020).

5. CONCLUSIONS

The aim of this paper is to analyze the impact of same-sex marriage on the interstate migration evolution of homosexuals in the United States. The mere access to marriage can encourage individuals to move to states having same-sex marriage if their lifetime utility in marriage is greater than that obtained in other forms of partnership or in singlehood (Black et al., 2007). From a theoretical point of view, the expected effect on the migration flow of homosexual appears to be positive.

To examine this issue, we used data covering the 50 states of the U.S. and the District of Columbia. Our results suggest that the legalization of same-sex marriage has a positive effect on the interstate migration flow of homosexuals to states having same-sex marriage, but this appears to be due to the response of gay men. Our findings are unaltered after adding controls for observable state-specific factors to different subsamples, and to the possible distance-related costs of migration.

A possible concern with prior research on the impact of same-sex marriage legislation on socio-demographic outcomes is that it omits other legal reforms affecting LGBT individuals. It could be surmised that this affected our results. The battle for LGBT rights has not ended, since even now, LGBT parents and their children in some states of the U.S. can be refused by social services or ejected from a business by someone who cites a religious belief. In this study, we show that the effect of same-sex marriage on homosexual migration between states is robust to the control of the prohibition of discrimination based on gender identity in adoption, employment, housing and public accommodation, the legalization of gender marker changes on birth certificates, the repeal of sodomy laws, and the legalization of other marriage alternatives (civil unions and domestic partnerships). As seen in Hamermesh and Delhommer (2020), it is the greater legal protection of marriage that plays a role rather than non-discriminatory legislation.

This study is the first to examine the dynamic response to same-sex marriage in terms of migration. Moreover, by exploiting the different timing of homosexual marriage legislation, this research fills a gap in the literature by exploring the impact of same-sex marriage on the geographical distribution of homosexuals in the U.S. Results appear to point to a positive and temporary effect. After five to six years, the positive effect on inflow migration is not translated to a statistically significant effect on the distribution of homosexuals in the U.S. Same-sex marriage legislation appears to play a role in the

movement of homosexuals across the U.S. but it is not sufficiently important to change their spatial distribution.

The legalization of same-sex marriage can also generate outflow migration of those individuals who are less tolerant of same-sex relationships. We tested this using data on the migration behavior of non-native individuals originating from intolerant countries (in which same-sex relations are illegal). These individuals may consider states that permit same-sex marriage to be less attractive because the cultural differences in their home countries discourage them from moving there. Our findings appear to confirm this. We observe a negative effect on the interstate migration of non-native migrants originating from intolerant countries following the legalization of same-sex marriage. Thus, cultural differences regarding homosexuality may be of significance in the migration decisions of some individuals.

Compliance with Ethical Standards: The authors declare that they have no conflict of interest.

REFERENCES

Ahmed, A. M., and Hammarstedt, M. (2010). "Sexual orientation and earnings: A register data-based approach to identify homosexuals", *Journal of Population Economics*, 23(3), 835-849.

Allen, B. D., Nunley, J. M., and Seals, A. (2011). "The effect of joint-child-custody legislation on the child-support receipt of single mothers", *Journal of Family and Economic Issues*, 32(1), 124-139.

Badgett, M. L. (1995). "The wage effects of sexual orientation discrimination", *Industrial and Labor Relations Review*, 48(4), 726-739.

Badgett, M. V. (2009). "The economic value of marriage for same-sex couples", *Drake Law Review*, 58, 1081.

Beaudin, L. (2017). "Marriage equality and interstate migration", *Applied Economics*, 49(30), 2956-2973.

Becker, G. (1973). "A theory of marriage: Part I", *Journal of Political Economy*, 81(4), 813–846.

Bellido, H., and Marcén, M. (2014), "Divorce laws and fertility", *Labour Economics*, 27, 56-70.

Bellido, H. and Marcén, M. (2015). "Spaniards in the wider World", *MPRA Paper 63966, University Library of Munich, Germany.*

Belot, M. V., and Hatton, T. J. (2012). "Immigrant Selection in the OECD", *The Scandinavian Journal of Economics*, 114(4), 1105-1128.

Black, D., Gates, G., Sanders, S., and Taylor, L. (2002). "Why do gay men live in San Francisco?", *Journal of Urban Economics*, 51(1), 54-76.

Black, D. A., Sanders, S. G., and Taylor, L. J. (2007). "The economics of lesbian and gay families", *Journal of Economic Perspectives*, 21(2), 53-70.

Borghans, L., and Golsteyn, B. H. (2012). "Job Mobility in Europe, Japan and the United States", *British Journal of Industrial Relations,* 50(3), 436-456.

Bureau of Labor and Statistics (2018). "labor market activity, education, and partner status among Americans at age 31: results from a longitudinal survey" https://www.bls.gov/news.release/pdf/nlsyth.pdf

Chang, S. (2020). "The sex ratio and global sodomy law reform in the post-WWII era", *Journal of Population Economics*, 1-30, https://doi.org/10.1007/s00148-020-00773-7

Clain, S. H., and Leppel, K. (2001). "An investigation into sexual orientation discrimination as an explanation for wage differences", *Applied Economics*, 33(1), 37-47.

Davies, P. S., Greenwood, M. J., and Li, H. (2001). "A conditional logit approach to US state-to-state migration", *Journal of Regional Science*, 41(2), 337-360.

Del Boca, D., and Ribero, R. (1998). "Transfers in non-intact households", *Structural Change and Economic Dynamics*, 9(4), 469-478.

Dillender, M. (2014). "The death of marriage? The effects of new forms of legal recognition on marriage rates in the United States", *Demography*, 51(2), 563-585.

Drewianka, S. (2008). "Divorce law and family formation", *Journal of Population Economics*, 21(2), 485-503.

Drydakis, N. (2011). “Women's sexual orientation and labor market outcomes in Greece”, *Feminist Economics*, 17(1), 89-117.

Drydakis, N. (2012). “Sexual orientation and labour relations: new evidence from Athens, Greece”, *Applied Economics*, 44(20), 2653-2665.

Drydakis, N. (2019). “Sexual orientation and labor market outcomes”, IZA World of Labor, doi: 10.15185/izawol.111.v2

Enchautegui, M. E. (1997). “Welfare Payments and Other Economic Determinants of Female Migration”, *Journal of Labor Economics*, 15 (3): 529–554, doi:10.1086/209871

Fiva, J. H. (2009). “Does Welfare Policy Affect Residential Choices? An Empirical Investigation Accounting for Policy Endogeneity”, *Journal of Public Economics* 93, 529-540.

Francis, A. M., Mialon, H. M., and Peng, H. (2012). “In sickness and in health: Same-sex marriage laws and sexually transmitted infections”, *Social Science and Medicine*, 75(8), 1329-1341.

Friedberg, L. (1998). “Did unilateral divorce raise divorce rates? Evidence from panel data”, *The American Economic Review*, 88(3), 608-627.

Gelbach, J. B. (2004). “Migration, the life cycle, and state benefits: How low is the bottom?”, *Journal of Political Economy*, 112(5), 1091-1130.

Gerstmann, E. (2017). “Same-Sex Marriage and the Constitution”. In Same-Sex Marriage and the Constitution (pp. I-Ii). Cambridge: Cambridge University Press.

Gius, M. (2011). “The effect of income taxes on interstate migration: an analysis by age and race”, *The Annals of Regional Science*, 46(1), 205-218.

González-Val, R. and Marcén, M. (2012). “Unilateral divorce versus child custody and child support in the U.S.”, *Journal of Economic Behavior & Organization*, 81(2), 613-643.

Goodridge v. Department of Public Health 440 Mass. 309, 798 N.E. 2d 941 (2003).

Greenwood, M. J. (1997). “Internal migration in developed countries”, *Handbook of Population and Family Economics*, 1, 647-720.

Grossbard, S., and Jepsen, L. K. (2008). "The economics of gay and lesbian couples: Introduction to a special issue on gay and lesbian households", *Review of Economics of the Household*, 6(4), 311-325.

Gurak, D. T., and Kritz, M. M. (2000). "The interstate migration of US immigrants: Individual and contextual determinants", *Social Forces*, 78(3), 1017-1039.

Halla, M. (2013). "The effect of joint custody on family outcomes", *Journal of the European Economic Association*, 11(2), 278-315.

Hamermesh, D. S., and Delhommer, S. (2020). "Same-Sex Couples and the Marital Surplus: The Importance of the Legal Environment", (No. w26875). National Bureau of Economic Research.

Hansen, M. E., Martell, M. E., and Roncolato, L. (2020). "A labor of love: The impact of same-sex marriage on labor supply", *Review of Economics of the Household*, 18, 265-283.

Hatzenbuehler, M. L., O'Cleirigh, C., Grasso, C., Mayer, K., Safren, S., and Bradford, J. (2012). "Effect of same-sex marriage laws on health care use and expenditures in sexual minority men: a quasi-natural experiment", *American Journal of Public Health*, 102(2), 285-291.

ILGA World, (2019). "International Lesbian, Gay, Bisexual, Trans and Intersex Association: Lucas Ramon Mendos", *State-Sponsored Homophobia*, Geneva.

Kane, M. (2003). "Social movement policy success: Decriminalizing state sodomy laws, 1969–1998", *Mobilization: An International Quarterly*, 8(3), 313-334.

Klawitter, M. (2015). "Meta-analysis of the effects of sexual orientation on earnings", *Industrial Relations: A Journal of Economy and Society*, 54(1), 4-32.

Langbein, L., and Yost, M. A. (2009). "Same-sex marriage and negative externalities", *Social Science Quarterly*, 90(2), 292-308.

Leo, T. W. (2008). "From Maternal Preference to Joint Custody: The Impact of Changes in Custody Law on Child Educational Attainment", *Working Paper.*

Long, L., Tucker, C. J., and Urton, W. L. (1988). “Migration distances: An international comparison”, *Demography*, 25(4), 633-640.

Lucas, R. E. (2001). “The effects of proximity and transportation on developing country population migrations”, *Journal of Economic Geography*, 1(3), 323-339.

Mayda, A. M. (2010). “International migration: A panel data analysis of the determinants of bilateral flows”, *Journal of Population Economics*, 23(4), 1249-1274.

McKinnish, T. (2005). “Importing the poor welfare magnetism and cross-border welfare migration”, *Journal of Human Resources*, 40(1), 57-76.

McKinnish, T. (2007). “Welfare-induced migration at state borders: New evidence from micro-data”, *Journal of Public Economics*, 91(3), 437-450.

Movement Advancement Project (2019), “Non-Discrimination Laws.” https://www.lgbtmap.org/equality-maps/non_discrimination_laws

Negrusa, B., and Oreffice, S. (2011). “Sexual orientation and household financial decisions: evidence from couples in the United States”, *Review of Economics of the Household*, 9(4), 445.

Nunley, J. M., and Seals, R. A. (2011). “Child-custody reform, marital investment in children, and the labor supply of married mothers”, *Labour Economics*, 18(1), 14-24.

Obergefell vs. Hodges, 576 U.S. (no. 14-556), 2015 WL 2473451

Ocobock, A. (2013). “The power and limits of marriage: Married gay men's family relationships”, *Journal of Marriage and Family*, 75(1), 191-205.

Patacchini, E., Ragusa, G., and Zenou, Y. (2015), “Unexplored dimensions of discrimination in Europe: Homosexuality and physical appearance”, *Journal of Population Economics*, 28(4), 1045-1073.

Pinello, D. R. (2016). “America's War on Same-sex Couples and Their Families: And how the Courts Rescued Them”. Cambridge: Cambridge University Press. doi:10.1017/CBO9781316402351

Plug, E., and Berkhout, P. (2004). “Effects of sexual preferences on earnings in the Netherlands”, *Journal of Population Economics*, 17(1), 117-131.

Rogers, A., and Raymer, J. (1998). "The spatial focus of US interstate migration flows", *Population, Space and Place*, *4*(1), 63-80**.**

Ruggles, S., Genadek, K., Goeken, R., Grover, J., and Sobek, M. (2018). *Integrated Public Use Microdata Series: Version 7.0 [Machine-readable database].* Minneapolis: University of Minnesota. https://doi.org/10.18128/D010.V8.0

Stevenson, B., and Wolfers, J. (2006). "Bargaining in the shadow of the law: Divorce laws and family distress", *The Quarterly Journal of Economics*, 121(1), 267-288.

Trandafir, M. (2015). "Legal recognition of same-sex couples and family formation", *Demography*, 52(1), 113-151.

Vossen, D., Sternberg, R. and Alfken, C. (2019) "Internal migration of the "creative class" in Germany", *Regional Studies*, 53 (10), 1359-1370.

Wolfers, J., 2006. "Did unilateral divorce laws raise divorce rates? A reconciliation and new results", *The American Economic Review*, 96(5), 1802–1820.

Table 1: The effect of same-sex marriage legalization on the percentage of homosexual migrants

Dependent variable: Percentage of homosexual migrants	(1) All	(2) Men	(3) Women
Same-sex marriage legalized 1–2 years ago	0.021*	0.027*	0.017
	(0.011)	(0.015)	(0.014)
Same-sex marriage legalized 3-4 years ago	0.064***	0.134***	0.005
	(0.017)	(0.022)	(0.022)
Same-sex marriage 5-6 legalized years ago	0.032	0.067**	0.005
	(0.025)	(0.034)	(0.032)
Same-sex marriage >7 legalized years ago	0.078***	0.106***	0.062*
	(0.028)	(0.040)	(0.035)
Mean	0.05	0.06	0.05
Observations	765	760	763
R^2	0.738	0.740	0.460

Note: Column 1 shows our baseline estimate. We exclude lesbian women in Column 2 and gay men in Column 3. All specifications shown include state and year fixed effects. Estimates using state population weights. Standard errors are in parentheses. ***p<0.01, ** p<0.05, *p<0.1.

Table 2: Simple robustness checks adding trends and controlling for economic and demographic variables

Dependent variable: Percentage of homosexual migrants	(1) Men	(2) Women	(3) Men	(4) Women	(5) Men	(6) Women
Same-sex marriage legalized 1–2 years ago	0.059***	0.022	0.027	0.017	0.027*	0.021
	(0.020)	(0.019)	(0.017)	(0.022)	(0.015)	(0.014)
Same-sex marriage legalized 3-4 years ago	0.233***	0.057	0.134*	0.005	0.136***	0.013
	(0.044)	(0.040)	(0.068)	(0.024)	(0.025)	(0.023)
Same-sex marriage legalized 5-6 years ago	0.273***	0.129*	0.067**	0.005	0.063*	0.020
	(0.073)	(0.068)	(0.028)	(0.050)	(0.037)	(0.034)
Same-sex marriage legalized >7 years ago	0.366***	0.269***	0.106***	0.062	0.087**	0.081**
	(0.102)	(0.090)	(0.039)	(0.039)	(0.043)	(0.038)
State*time	Yes	Yes	No	No	No	No
State*time^2	Yes	Yes	No	No	No	No
Mean	0.06	0.05	0.06	0.05	0.06	0.05
Observations	760	763	760	763	760	763
R^2	0.778	0.546	0.740	0.460	0.755	0.481

Note: All specifications shown include state and year fixed effects. Standard errors are clustered at state level in Columns 3 and 4. Columns 5 and 6 include controls for the proportion of white and black individuals, the proportion of individuals who have completed high school, who have studied 1 to 3 years of college, who have studied 4 or more years of college, the proportion of individuals by type of industry and the employment rate and by state and year. Estimates are weighted. Standard errors are in parentheses. ***p<0.01, ** p<0.05, *p<0.1.

Table 3: More robustness checks with different subsamples and redefining the dependent variable

Dependent variable: Percentage of homosexual migrants	(1) Men	(2) Women	(3) Men	(4) Women	(5) Men	(6) Women	(7) Men	(8) Women	(9) Men	(10) Women
Same-sex marriage	0.023	0.020	0.006	0.014	0.031**	0.031**	0.040**	0.018	0.005	0.006
legalized 1-2 years ago	(0.015)	(0.014)	(0.018)	(0.017)	(0.015)	(0.015)	(0.016)	(0.014)	(0.013)	(0.014)
Same-sex marriage	0.126***	0.006	0.221***	-0.042	0.130***	0.014	0.142***	0.013	0.052***	-0.019
legalized 3-4 years ago	(0.023)	(0.021)	(0.027)	(0.026)	(0.023)	(0.024)	(0.024)	(0.022)	(0.020)	(0.022)
Same-sex marriage	0.062*	0.004	0.079**	0.004	0.069**	0.012	0.063*	0.023	0.055*	-0.012
legalized 5-6 years ago	(0.034)	(0.031)	(0.040)	(0.039)	(0.035)	(0.035)	(0.035)	(0.032)	(0.030)	(0.032)
Same-sex marriage	0.097**	0.063*	0.149***	0.041	0.108***	0.079**	0.111***	0.060*	0.070**	0.053
legalized >7 years ago	(0.040)	(0.034)	(0.047)	(0.043)	(0.041)	(0.038)	(0.041)	(0.035)	(0.036)	(0.035)
Mean	0.06	0.05	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05
Observations	760	763	757	764	760	763	758	763	760	763
R^2	0.738	0.473	0.706	0.478	0.773	0.534	0.692	0.424	0.733	0.428

Note: Columns 1 and 2 include married individuals. Columns 3 and 4 include individuals aged 25 to 55. Those individuals who lived in other country the year before have been included in addition to those individuals who lived in a different state in the previous year, in Columns 5 and 6. Columns 7 and 8 only include those individuals who are originating from the US. The dependent variable is redefined as the percentage of homosexuals who move to state c from another state where same-sex marriage was illegal in the year t in Columns 9 and 10. All specifications shown include state and year fixed effects. Estimates are weighted. Standard errors are in parentheses. ***p<0.01, ** p<0.05, *p<0.1.

Table 4: The effect of same-sex marriage on the percentage of homosexual migrants including other laws

Dependent variable: Percentage of homosexual migrants	(1) All	(2) Men	(3) Women
Same-sex marriage legalized 1–2 years ago	0.018*	0.025*	0.015
	(0.011)	(0.015)	(0.014)
Same-sex marriage legalized 3-4 years ago	0.055***	0.121***	-0.0001
	(0.017)	(0.023)	(0.022)
Same-sex marriage legalized 5-6 years ago	0.014	0.036	-0.005
	(0.027)	(0.036)	(0.034)
Same-sex marriage legalized >7 years ago	0.061*	0.077*	0.058
	(0.031)	(0.044)	(0.039)
Prohibition of discrimination by adoption agencies	-0.030	-0.044	-0.002
based on sexual orientation and gender identity	(0.023)	(0.031)	(0.031)
Prohibition of discrimination based on	-0.002	0.004	-0.015
gender identity in employment, housing or public accommodations	(0.013)	(0.017)	(0.016)
Allowing a gender marker change	0.020**	0.036***	0.012
on birth certificates	(0.010)	(0.014)	(0.013)
Repeal of sodomy laws	0.033	-0.018	0.078
	(0.071)	(0.096)	(0.094)
Other marriage alternatives	0.012	0.003	0.013
	(0.013)	(0.018)	(0.017)
Mean	0.05	0.06	0.05
Observations	765	760	763
R^2	0.740	0.743	0.462

Notes: Columns show results after controlling for the prohibition of discrimination by adoption agencies and officials based on sexual orientation and gender identity, the prohibition of discrimination based on gender identity in employment, housing and public accommodation, the approval of gender marker change on birth certificates, the introduction of the repeal of sodomy laws, and the legalization of civil unions or partnership respectively. All specifications shown include state and year fixed effects. Estimates are weighted. Standard errors are in parentheses. ***p<0.01, ** p<0.05, *p<0.1.

Table 5: The effect of same-sex marriage on the percentage of homosexual migrants controlling for cost of migration

Dependent variable: Percentage of homosexual migrants	(1) All	(2) Men	(3) Women	(4) All	(5) Men	(6) Women
Same-sex marriage	0.022*	0.028*	0.018	0.021*	0.027*	0.017
legalized 1-2 years ago	(0.011)	(0.015)	(0.014)	(0.011)	(0.015)	(0.014)
Same-sex marriage	0.068***	0.142***	0.009	0.064***	0.134***	0.005
legalized 3-4 years ago	(0.017)	(0.024)	(0.022)	(0.017)	(0.022)	(0.022)
Same-sex marriage	0.033	0.082**	0.001	0.032	0.067**	0.005
legalized 5-6 years ago	(0.026)	(0.036)	(0.032)	(0.025)	(0.034)	(0.032)
Same-sex marriage >7	0.082***	0.118***	0.065*	0.078***	0.106***	0.062*
legalized >7 years ago	(0.029)	(0.041)	(0.035)	(0.028)	(0.040)	(0.035)
Mean	0.06	0.06	0.05	0.05	0.06	0.05
Observations	750	745	748	765	760	763
R^2	0.737	0.739	0.465	0.738	0.740	0.460

Note: We control for the number of air passengers arriving each state and year in all columns. Data comes from the Bureau of Transportation Statistics. The variation in the sample size is due to the no availability of data on the number of passengers for the District of Columbia. Table A3 presents the results for our main analysis using this subsample without D.C. Columns 1 to 3 present the results after including it. Columns 4 to 6 are the same as in Table 1. All specifications shown include state and year fixed effects. Estimates are weighted. Standard errors are in parentheses. ***p<0.01, ** p<0.05, *p<0.1.

Table 6: The effect of same-sex marriage on the stock of homosexual migrants

Dependent variable: Percentage of homosexual migrants	(1) All	(2) Men	(3) Women
Same-sex marriage legalized 1–2 years ago	0.013	0.045***	-0.002
	(0.010)	(0.016)	(0.013)
Same-sex marriage legalized 3-4 years ago	-0.005	0.066***	-0.041**
	(0.015)	(0.024)	(0.020)
Same-sex marriage legalized 5-6 years ago	-0.000	0.021	-0.000
	(0.022)	(0.036)	(0.029)
Same-sex marriage legalized >7 years ago	-0.020	0.000	-0.033
	(0.025)	(0.043)	(0.032)
Mean	0.42	0.43	0.41
Observations	765	764	765
R^2	0.872	0.868	0.743

Note: This table shows the effect of same-sex marriage on the stock of homosexual migrants. All specifications shown include state and year fixed effects. Estimates are weighted. Standard errors are in parentheses. ***p<0.01, ** p<0.05, *p<0.1

Table 7: Migration of individuals originating from intolerant countries

Dependent variable: Percentage of non-native individuals	(1) Countries with criminalization
Same-sex marriage legalized1–2 years ago	-0.029**
	(0.013)
Same-sex marriage legalized 3-4 years ago	-0.050**
	(0.020)
Same-sex marriage legalized 5-6 years ago	-0.049
	(0.031)
Same-sex marriage legalized >7 years ago	-0.057
	(0.037)
Mean	0.06
Observations	765
R^2	0.656

Note: Specification includes state and year fixed effects. Estimates are weighted. Standard errors are in parentheses. ***p<0.01, ** p<0.05, *p<0.1

Appendix

Table A1: Data on the year of the introduction of other laws

State	Year discrimination based on gender identity in adoption banned	Year discrimination based on gender identify in employment, housing or public accommodations banned	Year gender marker change on birth certificates allowed	Year the repeal of sodomy laws	Year civil union or domestic partnership
Alabama			1992		
Alaska			2012	1978	
Arizona			2006	2001	
Arkansas			1995	2002	
California	2003	2003	2014	1975	2000
Colorado		2007	2019	1971	2013
Connecticut		2004	2012	1969	2005
Delaware		2013	2017	1972	2012
District of	1977	2006	2013	1993	2002
Florida			2018		
Georgia			2005	1998	
Hawaii		2005	2015	1972	2012
Idaho			2018		
Illinois		2005	2017	1961	2011
Indiana			2006	1976	
Iowa		2007	2004	1976	
Kansas			2019		
Kentucky			2005	1992	
Louisiana			2006		
Maine		2005	2005	1975	2004
Maryland	2019	2014	2006	1999	2008
Massachusetts		2011	2006	2002	
Michigan			2006		
Minnesota		1993	2006	2001	
Mississippi			2006		
Missouri			2006		
Montana			2017	1997	
Nebraska			2005	1977	
Nevada	2015	2011	2006	1993	
New Hampshire		2018	2006	1973	
New Jersey	2019	2007	2013	1978	
New Mexico		2003	2019	1975	
New York	2019	2015	2014	1980	1997
North Carolina			2005		
North Dakota			2005	1973	
Ohio				1972	
Oklahoma					
Oregon	2007	2007	2017	1971	2008
Pennsylvania			2016	1980	
Rhode Island	2015	2001	2005	1998	2011
South Carolina					
South Dakota				1976	
Tennessee				1996	
Texas					
Utah		2015	2004		
Vermont		2007	2011	1977	2000
Virginia			2006		
Washington		2006	2018	1975	2007
West Virginia			2006	1976	
Wisconsin			2006	1983	2009
Wyoming			2005	1977	

Notes: This table shows the year in which each law was introduced in each state. Column 2 presents the first year in which employment, housing or public accommodations non-discrimination law covering sexual orientation and gender identity was introduced. Column 3 shows the first year allowing gender marker change on birth certificates. Data for these three columns come from the Movement Advancement Project. Column 4 lists the year in which states have decriminalized sodomy. Data come from Kane (2003). Column 5 presents the timing of the law allowing civil unions or domestic partnership. Data come from Hansen et al. (2020).

Table A2: More robustness with different subsamples

Dependent variable: Percentage of homosexual migrants	(1) All (without those states and years in which there is not available information about lesbians or gays)	(2) Men (including all states and years)	(3) Women (including all states and years)	(4) All (without District of Columbia)	(5) Men (without District of Columbia)	(6) Women (without District of Columbia)
Same-sex marriage legalized	0.021*	0.027*	0.017	0.021*	0.028*	0.017
1-2 years ago	(0.011)	(0.015)	(0.014)	(0.011)	(0.015)	(0.014)
Same-sex marriage legalized	0.064***	0.134***	0.005	0.066***	0.143***	0.005
3-4 years ago	(0.017)	(0.022)	(0.022)	(0.017)	(0.024)	(0.022)
Same-sex marriage legalized	0.032	0.066**	0.005	0.034	0.082**	0.003
5-6 years ago	(0.025)	(0.033)	(0.032)	(0.026)	(0.036)	(0.033)
Same-sex marriage legalized	0.078***	0.106***	0.062*	0.081***	0.118***	0.062*
>7 years ago	(0.028)	(0.039)	(0.035)	(0.029)	(0.041)	(0.035)
Mean	0.06	0.06	0.05	0.06	0.06	0.05
Observations	758	765	765	750	745	748
R^2	0.738	0.740	0.460	0.736	0.739	0.459

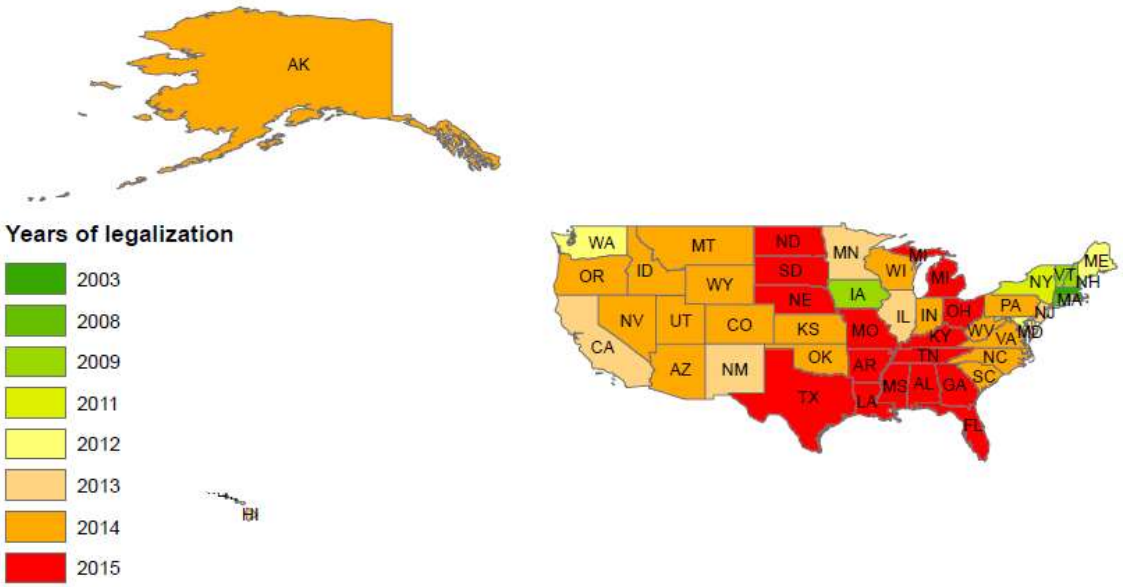
Note: Estimate in column 1 does not include those states and years in which there is not available information about lesbian women or gay men. Columns 3 and 4 include those states without lesbian women or gay men, using a value equal to zero in the dependent variable for those states and years. We exclude District of Columbia in Columns 4 to 6. All specifications shown include state and year fixed effects. Estimates are weighted. Standard errors are in parentheses. ***p<0.01, ** p<0.05, *p<0.1.

Table A3: The effect of same-sex marriage legalization on the percentage of homosexual migrants controlling for prior patterns

Dependent variable: Percentage of homosexual migrants	(1) All	(2) Men	(3) Women	(4) All	(5) Men	(6) Women	(7) Men	(8) Women
Same-sex marriage legalized 1-2 years later	0.017	0.009	0.022					
	(0.011)	(0.015)	(0.014)					
Same-sex marriage legalized 1–2 years ago	0.037**	0.035*	0.041**	0.017	-0.002	0.035	0.018	0.019
	(0.015)	(0.021)	(0.020)	(0.024)	(0.033)	(0.028)	(0.015)	(0.014)
Same-sex marriage legalized 3-4 years ago	0.086***	0.146***	0.038	0.142***	0.256***	0.043	0.137***	0.010
	(0.022)	(0.030)	(0.028)	(0.035)	(0.049)	(0.041)	(0.023)	(0.022)
Same-sex marriage legalized 5-6 years ago	0.058*	0.075*	0.048	0.107*	0.154*	0.075	0.065*	0.039
	(0.031)	(0.042)	(0.038)	(0.058)	(0.080)	(0.068)	(0.034)	(0.032)
Same-sex marriage legalized >7 years ago	0.103***	0.103**	0.117***	0.046	0.036	0.059	0.085**	0.004
	(0.036)	(0.050)	(0.044)	(0.081)	(0.113)	(0.095)	(0.040)	(0.035)
Mean	0.05	0.06	0.05	0.06	0.06	0.05	0.06	0.05
Observations	765	760	763	315	313	315	760	763
R^2	0.742	0.755	0.483	0.820	0.837	0.602	0.741	0.458

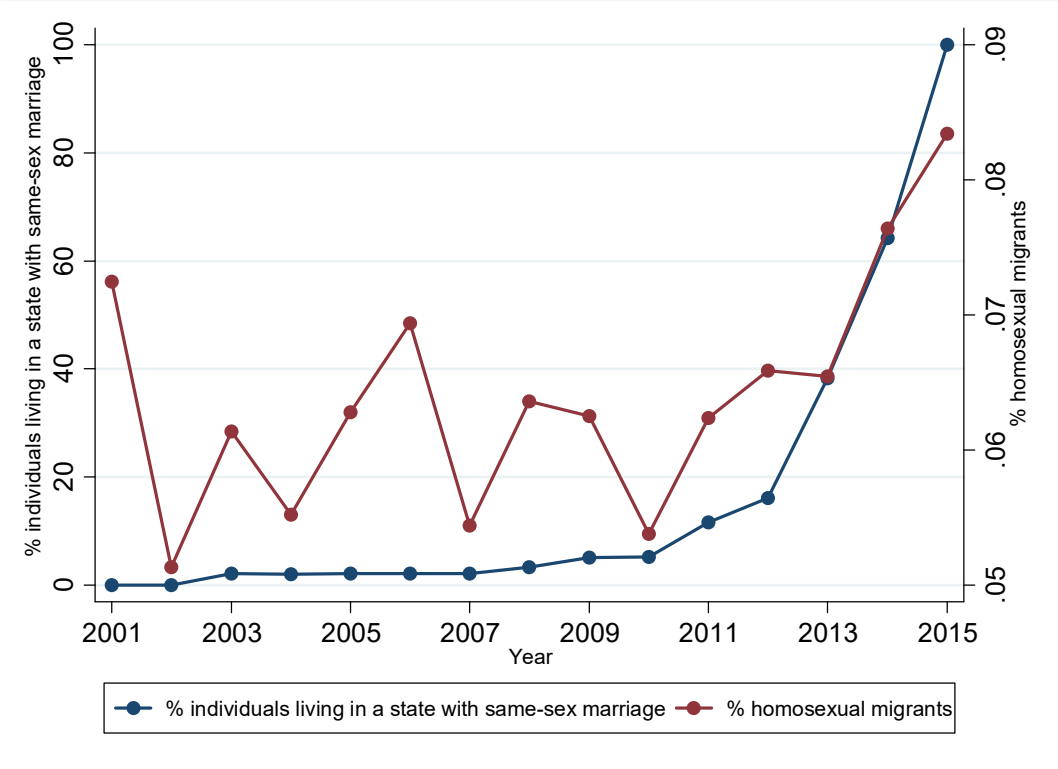
Notes: Columns 1 to 3 show our baseline estimate but including a dummy variable which takes the value 1 1-2 years prior to the legalization of the same-sex marriage. We limit the sample to those states that legalized same-sex marriage via a judicial decision in Columns 4 to 6. Data come from Hansen et al. (2020). We use the effective date of same-sex legalization in Columns 7 and 8. All specifications shown include state and year fixed effects. Estimates are weighted. Standard errors are in parentheses. ***p<0.01, ** p<0.05, *p<0.1.

Figure 1: Evolution of same-sex marriage across states



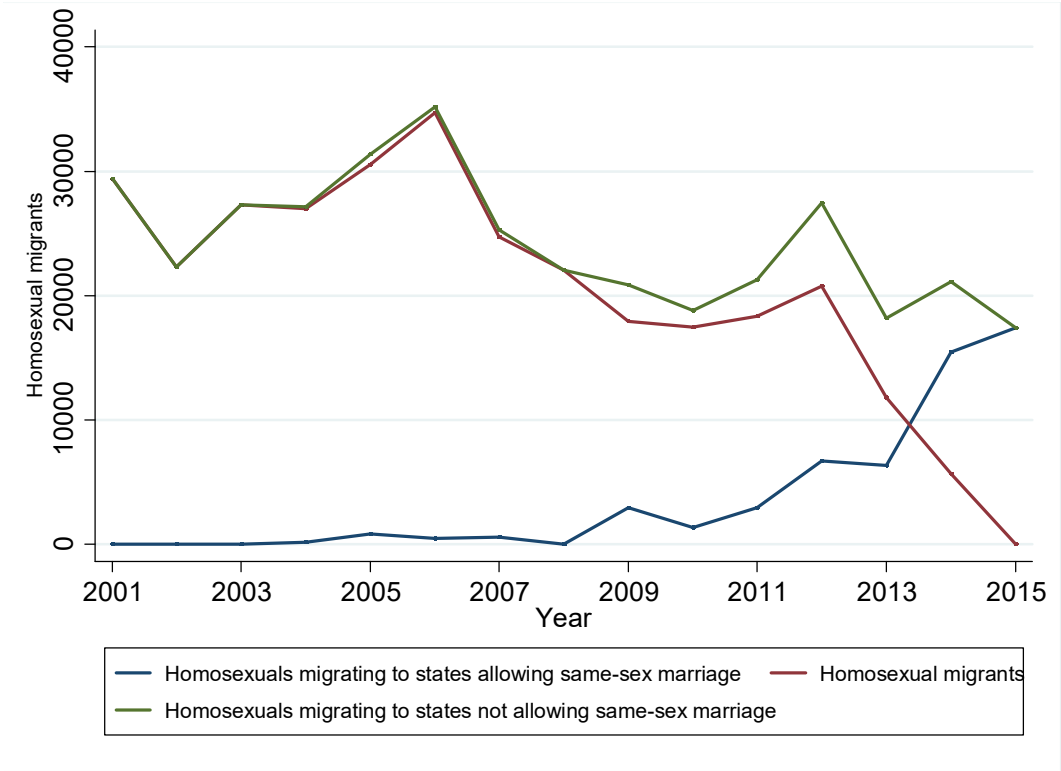
Note: This figure presents the years of the introduction of same-sex marriage.

Figure 2: Percentage of individuals living in a state with same-sex marriage and percentage of homosexual migrants during the period 2001-2015



Note: Data comes from The American Community Survey of Integrated Public Use Microdata Series. The percentage of individuals living in a state with same-sex marriage is defined as the total number of individuals living in all states with same-sex marriage among the total population in year *t*. The percentage of homosexual migrants is defined as the average of the number of homosexual migrants to state *i* over the total homosexuals at risk of migrating multiplied by 100 in year t.

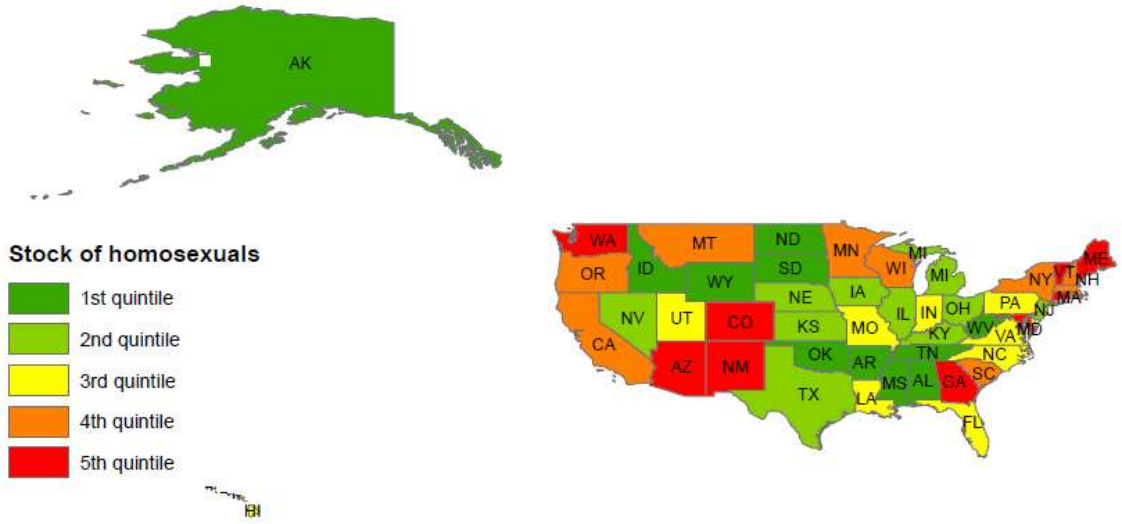
Figure 3: Homosexuals migrating to states allowing same-sex marriage vs homosexuals migrating to states not allowing same-sex marriage



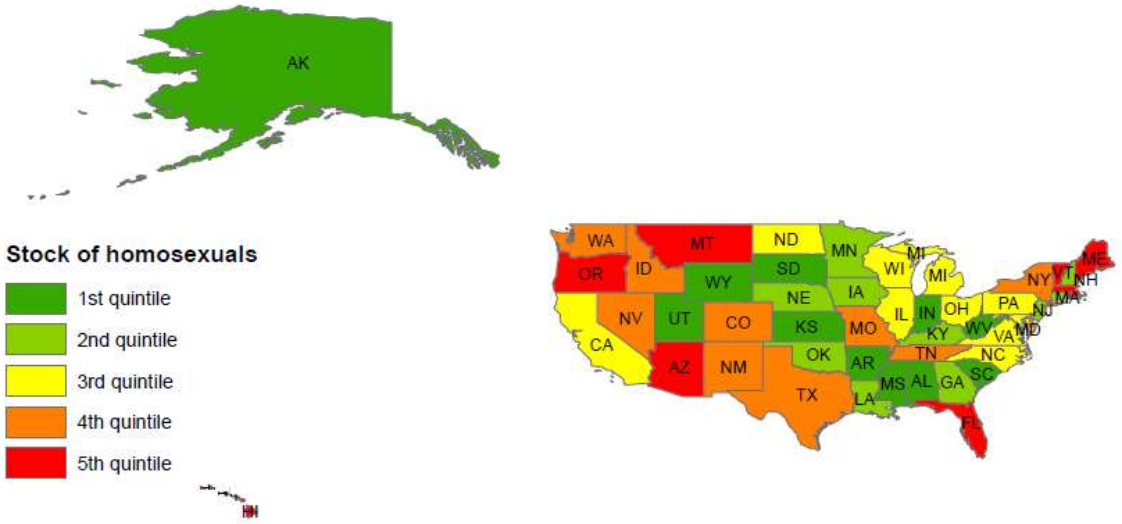
Note: This figure has been calculated using data from The American Community Survey of Integrated Public Use Microdata Series. We use a sample of homosexuals aged 30 to 64 who can legally marry.

Figure 4: The number of homosexuals (stock)

2003



2015



Note: This figure has been calculated using data from The American Community Survey.