Changes in implicit bias, discrimination and economic growth: Evidence from the legalization of same-sex marriage

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Abstract

Mainstream economics has been, with a few exceptions, blind to the economic effects of discrimination of minority groups. Recently, Hsieh et al. (2019) showed that declining obstacles to human capital accumulation and labor market discrimination for blacks and women explain 44 percent of growth of U.S. GDP per person between 1960 and 2010. There has not been a formal study, to date, that investigates if a similar mechanism exists for sexual minorities. The way in which same-sex marriage (SSM) was legalized in the U.S., a staggered roll-out design, allows for the possibility of causal research. Using a homophobic (Google) search index (HSI) I find that whether SSM legalization occurred via the legislature, or the judiciary had dramatical different effects, ranging from 25 percent lower to 35 percent higher levels on the HSI, respectively. These changes in homonegative sentiment likely had an impact on economic performance. Building on Black et al. (2007)'s finding that gay men tend to concentrate in industries where most workers are women, as they might experience less discrimination, I construct a variable of the chained GDP of the five industries that have the least share of women, by state. I find evidence suggesting that 10 years after SSM legalization via the judiciary, this GDP measure was 23.93 percent lower, had SSM not been legalized that way. I argue that an increased misallocation of gay men workers might have driven this worsened economic performance. Whilst normatively sexual minorities ought to have equal rights, there may be more and less effective ways to achieve this goal.

*This writing sample is based on my undergraduate honors thesis. I am currently revising my honors thesis in aims of turning it into a working paper and intend to reflect these changes in the writing sample.

1 Introduction

Mainstream economics has been, with a few exceptions, blind to the economic effects of discrimination of minority groups. Most of the literature focuses on testing what are the underlying motives for apparent discriminatory behavior: taste-based discrimination, statistical discrimination or discrimination driven by social norms. (Sansone, 2019) While knowing the underlying mechanisms of discrimination is useful for determining which are the appropriate policies to counter it, less is known about the direct economic effects of discrimination, whichever its motivations. Knowing the direct economic effects of discrimination aids in calculating the opportunity costs of preserving the *status quo*.

Recently, Hsieh et al. (2019) showed that declining obstacles to human capital accumulation and declining labor market discrimination for blacks and women explain 44 percent of growth of U.S. GDP per person between 1960 and 2010. They argue that a decrease in the misallocation of human capital across industries is the main mechanism behind this finding. In 1960, white men accounted for 94 percent of doctors and lawyers; by 2010, they made up for just over 60 percent and similar patterns occurred throughout the economy, particularly in high-skill occupations. Since 1960, women and black men both increased their human capital accumulation and increased their participation in high-skill industries, which in turn shifted the skill distribution to the right. There has not been a formal study, to date, that investigates if a similar mechanism exists for LGBTQ people. This is particularly relevant given that recent polls suggest LGBTQ populations estimates have been highly underestimated and hence their impact in the economy is likely to be higher than previously thought. (Jones, 2021) Synthetically, I investigate if same-sex marriage (SSM) legalization leads to changes in discrimination towards sexual minorities, and if so, whether this translates in changes in economic performance.

There are three main contributions of this paper. First, hypothesizing based on Constitutional Law theory I test for heterogeneous impacts in discrimination depending on whether SSM is legalized through the legislature or the judiciary.[1] Second, I proxy discrimination using a veiled measure for discriminatory attitudes towards homosexual men, building on the fact that survey respondents are likely to lie whenever being asked to give their opinion about sensitive topics directly, i.e., using an unveiled measure. Third, I test for changes in economic performance of the industries where discrimination is more likely to be prevalent and hence so does misallocation.

Using a stacked Difference-in-Difference (DiD) approach, which avoids the pitfalls of the canonical Two-Way-Fixed-Effects in a staggered treatment setting, I find that the

[1] The work most closely related does not consider this potentially differentiated impact of SSM. Kreitzer et al. (2014), Bishin et al. (2016) and Flores and Barclay (2016) either focus on a single jurisdiction or do not test for heterogeneous impacts. Ofosu et al. (2019) is the work most closely related but they use a rather biased proxy for discrimination.

legalizing SSM through the judiciary leads to *increased* levels of homophobic attitudes measured through the volume of google searches of the homophobic epithet. Legalization through the legislature generates the opposite pattern and I find *decreased* homophobic attitudes in the following years. Based on these results, I test for a differentiated economic performance of the industries more likely to be misallocated regarding homosexual men. I find that states where SSM was legalized through the judiciary, and hence had an increase in homophobic attitudes had a *decreased* economic performance in the aforementioned industries. On the contrary, states where SSM was legalized through the legislature had an *increased* economic performance in the same industries.

The remainder of the paper is organized as follows. Section 2 gives a brief background of the motivation of this study. Section 3 lays down the data used. Section 4 discusses the empirical strategy. Section 5 shows the results, and Section 6 concludes.

2 Background

The way in which same-sex marriage was legalized in the U.S., a staggered roll-out design, allows for the possibility of causal research. Same-sex marriage legalization in the U.S. started in 2004, when the Massachusetts Supreme Judicial Court ruled in *Goodridge v. Department of Public Health* that it was unconstitutional under the Massachusetts Constitution to allow only opposite-sex couples to marry. It became legal nationwide in 2015 with *Obergefell v. Hodges*, a landmark decision of the Supreme Court of the United States (SCOTUS). Between 2004 and 2015, eleven states and D.C. legalized SSM through their local legislatures, in twenty-four it became legal through a federal court order, and in the remainder fifteen it became legal due to *Obergefell v. Hodges*.

Constitutional Law theory, and specifically the judicial backlash thesis, suggests that whereas legalization via the legislature would lead to a positive shift in attitudes towards LGBTQ populations, legalization through the judiciary may lead to backlash. Siegel (2017) explains that according to the judicial backlash thesis, courts striking down popular legislation to vindicate minority rights are not only ineffective, but counterproductive: "judicial decisions "shutting down" politics could frustrate democratic majorities in ways that would produce more virulent politics than might have resulted had judges refused to intervene". In plain terms, as the judiciary is not legitimized to make political decisions (as they are not democratically elected), when they settle controverted debates through rulings, a backlash occurs. I theorize, then, that a backlash would occur only in states where the method of legalization was judicial.

According to Siegel (2017), opponents of SSM in the U.S. argued that even if there was a case for recognizing it, in a constitutional democracy that question is up for determination by legislatures, not courts. On this note, in the landmark SCOTUS case Obergefell v. Hodges, Chief Justice Roberts insisted that SSM had an undeniable ap-

peal, but argued against making it the law of the land through a ruling as the SCOTUS is not a legislature.

3 Data

Most studies on the impact of same-sex marriage on public opinion rely on survey data. Nonetheless, as Coman et al. (2017) show, it is likely that these measures underestimate the prevalence of homonegative attitudes. In a series of online experiments using a large and diverse but nonrepresentative sample, they compare population estimates from the standard methodology of asking sensitive questions to measures from a "veiled" methodology. The veiled method increased self-reports of anti-gay sentiment. Particularly, in the workplace, respondents were 67 percent more likely to disapprove of an openly gay manager when asked with a veil, and 71 percent more likely to say it should be legal to discriminate in hiring on the basis of sexual orientation. Their results motivate the use of alternative methods to measure homonegative sentiment.

Similarly, I construct a homophobic search index (HSI) at the state level using the search rate for the words "faggot", "faggots", "fag", "fags", as well as their misspellings, "fagot" and "fagots". Search results are normalized to the time and location of a query by the following process: Each data point is divided by the total searches of the geography and time range it represents to compare relative popularity. Otherwise, places with the most search volume would always be ranked highest. The resulting numbers are then scaled on a range of 0 to 100 based on a topic's proportion to all searches on all topics. omplications arise as Google limits the number of geographical areas that can be compared at the same time to five. To elude this limitation, I consider the approach taken by Paul Goldsmith-Pinkham (2020). I obtain data for each geographical area plus Los Angeles and renormalize each area by maxIndexs/maxIndexLA.

It is worth stressing that while Google Search indisputably receives the most daily number of queries than any other search engine in the U.S., its representativeness has not been the same throughout its history. For instance, the U.S. search index for "weather", a fairly common search query, displays an upward trend from 2004 to date. This likely reflects the increase in access to the internet. In order to control for this trend, in every regression where a search index is the dependent variable, I include the search index for "weather" as a control.

he considers the fact that, according to Plug et al. (2014), LGBTQ workers tend to sort into tolerant occupations, as comparing twins with dierent sexual orientations, gays, lesbians and bisexuals were less likely to work in occupations with prejudiced workers. As well as the fact that, according to Black et al. (2007), workers in male same-sex couples were in occupations with a higher proportion of women than workers in dierent-sex couples. He then tests if same-sex marriage legalization induced a shift of minority

workers towards historically tolerant occupations (or to disclose their sexual orientation if already employed in these sectors). He finds that the probability of being employed in an occupation with a majority of female workers decreased by 1.4 percentage points after same-sex marriage legalization.

Using the shares of women by industry and state in 2000, as these appear stable through time, I construct the variable GDPLast5j,2000 j,t represented synthetically by Equation 3.1, which is the sum of the five industries k with the lowest share of women in 2000 by state j and year t.

I use the ACS between 2000 and 20199, which consists of 51,401,670 observations, to compute state-level variables, but keep only observations for individuals aged between 18 and 65 as well as on their married or unmarried partners, 18,861,875 observations, I use the ACS between 2000 and 20199, which consists of 51,401,670 observations, to compute state-level variables, but keep only observations for individuals aged between 18 and 65 as well as on their married or unmarried partners, 18,861,875 observations, whenever computing the share of same- and dierent-sex couples.

Specifically, the state-level controls used through this paper are: i) share of same-sex couples; ii) share of unmarried dierent-sex couples; iii) share of adults between 18 and 35 years old; iv) share of people with 4+ years of higher education; v) share of adults between 18 and 65 that are employed; vi) the average total pre-tax personal annual income or loses; vii) proportion of the population that is black; and viii) proportion of the population that Hispanic. Every variable is computed by year and state.

I download Gross Domestic Product (GDP) data from the U.S. Bureau of Economic Analysis (BEA).12 for every year from 2000 to 2019. The GDP data is disaggregated by state, year and NAICS industry. I consider the chained GDP to focus on real changes.

4 Empirical Strategy

it is particularly relevant for staggered rollout designs. Goodman-Bacon (2018) explains the problem with TWFE arises when already-treated units act as controls, as changes in their treatment effects over time get subtracted from the TWFE estimate.

Following Cengiz et al. (2019) and Baker et al. (2021) I create event-specific datasets (for every year one or many states legalize SSM), including the outcome variable and controls for the treated state and all other states up to when they become treated. Thus, I am only including the untreated observations for the states not in that cohort. This way, I have only "clean controls" for every group. I then stack these event-specific datasets in relative time to calculate the event-studies relative to the reference period, which is the treatment year.

As Baker et al. (2021) notes, the only dierence in terms of functional form regarding a simple event-study regression is the need to saturate the group and time fixed eects with

indicators for each event-specific dataset. I restrict the time window of the event study to [-5, 1] and [1, 10]. One main dierence between the stacked regression event-studies and a simple event-studies is that in the former, there is no need to include the full set of relative time indicators, as it is the case with the latter.

5 Results

Figure 5.1 shows the event-studies by legalization method of same-sex marriage of the log of the constructed homophobic search index. The left panel considers as treated units only states where it was legalized through a court decision. Under the same assumptions, 9 and 10 years later, this search index is 36.06 and 35 percent higher than the year SSM was legalized, respectively. The opposite is true for the states that legalized SSM through the legislature, but the change seems to happen at a faster rate.

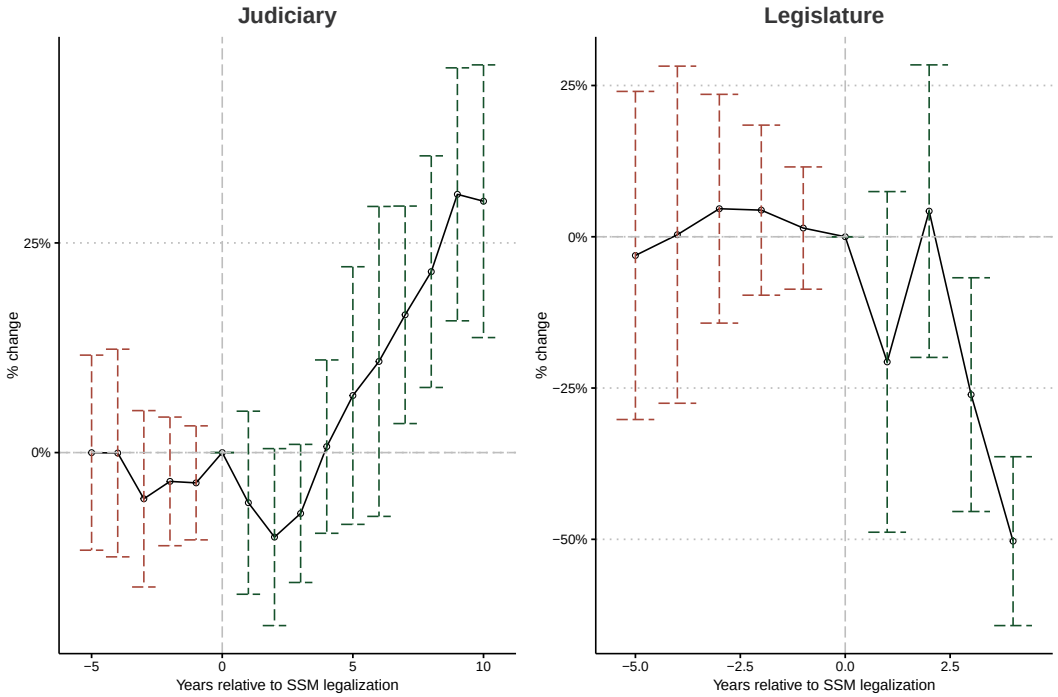

Figure 1: Event study by legalization method using stacked regressions. $log(HSI)$ as dependent variable.

Considering a log transformation of a variable as the dependent variable in an Ordinary Least Squares regression yields a coefficient with an interpretation of an approximate percentage change. The correct percentage change is obtained using the formula $\%y = 100(e^{\beta} - 1)$ where y is the non-transformed dependent variable and β the coefficient of interest. I obtain the percentage change this way for all the results presented non-graphically.

Making a weak case for the external validity of these results, let us consider the Colombian case. The Colombian Constitutional Court (CCC) might be, to my knowledge, one of the most active constitutional courts in the world advancing in the recognition of rights of sexual minorities. Andrade-Rivas and Romero (2017) mention that as of 2013, the CCC had issued 70 rulings in favor of freedom of expression and personal development with regard to LGBTQ rights, as well as had both legalized same-sex unions and their right to adopt by 2015. Bocanumenth (2021) reports how even though on paper the country has one of the strongest legal frameworks in Latin America defending the rights of LGBTQ populations (mostly due to judicial decisions), in practice these protections are rarely enforced. This lack of eective protections might reflect Baca et al. (2019)'s findings that out of nine countries in Latin America and the Caribbean, Colombia registered the highest number of killings of LGBTQ people over 2014 – 2019.

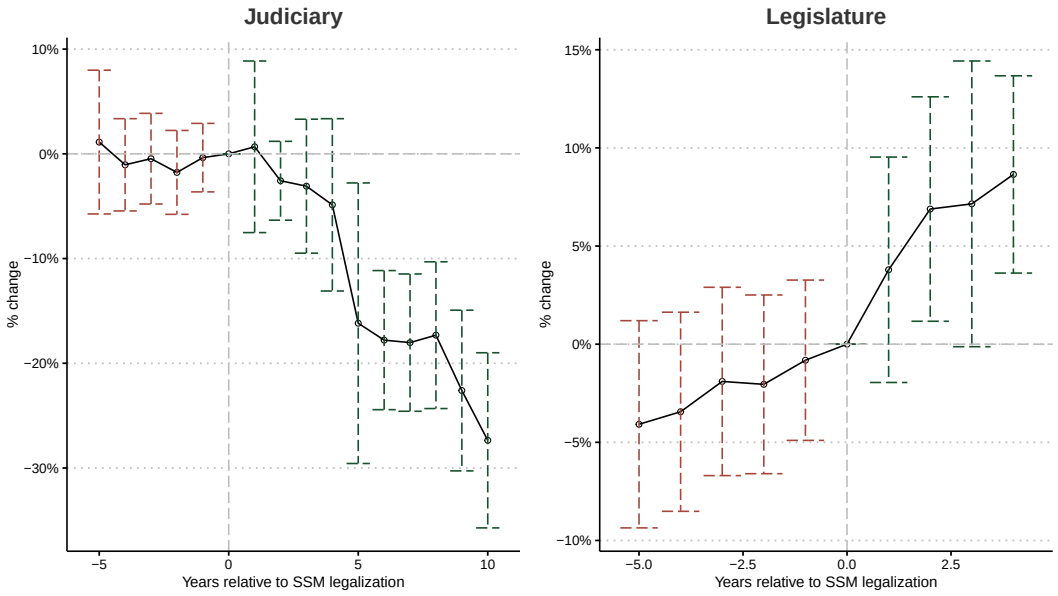

Figure 2: Event study by legalization method using stacked regressions. $log(GDP_{j,t}^{Last5_{j,2000}})$ as dependent variable.

In regard to states that legalized SSM through a court decision, and assuming again that there are parallel trends, Figure 5.3 states that relative to the reference period, the NAICS industries with the lowest share of women by state, decreased chained GDP by 23.93 percent ten years after SSM legalization through the judiciary, had it not legalized it that way. While the states that legalized through the legislature exhibit the opposite pattern, the parallel trends assumption seems more implausible to hold as the point estimates exhibit an upward trend, even if they are not statistically significant.

6 Conclusion

Do all same-sex rights are created equal? My research, using a measure of implicit bias for anti-gay attitudes, suggests that this is not the case. The literature of public opinion changes due to SSM remains far from settled. I hypothesize that this is mainly due to the lack of considering heterogeneities. Having a better understanding of the dierent channels through which social norms shift, means more and better tools to keep moving forward. Normatively, one can agree that more equal rights for sexual minorities imply a Pareto improvement in society. The small print is that there are more and less eective ways to get there, whilst some may end up being counterproductive. Even more so, as this research provides suggestive evidence that some of these ways have real eects on the economy.

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