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UNIVERSITY OF CALIFORNIA  
RIVERSIDE

Essays on Labor Market Discrimination  
on the Basis of Sexual Orientation

A Dissertation submitted in partial satisfaction  
of the requirements for the degree of

Doctor of Philosophy

in

Economics

by

Michael David Levine

June 2016

Dissertation Committee:

Dr. Mindy Marks, Co-Chairperson

Dr. Todd Sorensen, Co-Chairperson

Dr. Michael Bates

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2016

The Dissertation of Michael David Levine is approved:

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University of California, Riverside

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Thank you to my family for encouraging me to fulfill my aspirations.

## ABSTRACT OF THE DISSERTATION

Essays on Labor Market Discrimination  
on the Basis of Sexual Orientation

by

Michael David Levine

Doctor of Philosophy, Graduate Program in Economics  
University of California, Riverside, June 2016  
Dr. Mindy Marks, Co-Chairperson  
Dr. Todd Sorensen, Co-Chairperson

The following chapters present an examination of the causes and effects of labor market discrimination on the basis of sexual orientation.

The first chapter examines customer-based discrimination, which occurs when prejudice leads individuals to prefer commercial interactions with certain groups of workers to others. Under customer-based discrimination, otherwise identical employees across different classes of workers are not perfect substitutes, as race, gender or sexual orientation becomes a component of workplace productivity.

This is the first paper to identify customer discrimination against gay and lesbian workers. I exploit geographic variation in attitudes towards homosexuality to see if occupational sorting choices vary amongst gay workers in less prejudiced parts of the country versus more prejudiced parts of the country. To this end, I construct a novel

state-level index of attitudes towards homosexuality using individual survey responses to questions about taste. Multiple specifications provide evidence that gay men sort away from customer service jobs in areas of the country with strong levels of distaste for homosexuality. I do not, however, find evidence that this occupational sorting exists amongst lesbian women.

The second chapter explores whether firms that partake in taste-based discrimination on the basis of sexual orientation will face a profit penalty, consistent with the Becker model of discrimination. Prior research on discrimination against gay workers has established other aspects of the Becker model, however, the profit penalty is less established in the literature. This paper improves upon existing estimates of the relationship between profits and discriminatory policies by introducing fixed effects to isolate the effect of changes in corporate policy. Additionally, this paper introduces discrete levels of discrimination as explanatory variables to assist in framing the identified effect in the context of the Becker model.

Under multiple specifications, evidence of a relationship between CEI score and profit rate is detected robust to the inclusion of firm fixed effects. These estimates suggest profit rates are improved when firms move from high levels of discrimination to low levels. Consistent with the Becker model, there appears to be no profit increase when low-discriminating firms further advance non-discriminatory policies.

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## CHAPTER 1 - Customer-Based Discrimination and Sexual Orientation:

### Evidence from Geographic Variation in Occupational Sorting

#### **I. Introduction**

A rapidly developing segment of economic research is devoted to understanding the relationship between individuals who identify as gay, lesbian, or bisexual and the labor market. Beginning with the formative work by Becker (1957), economists have studied the relationship between discrimination and the labor market. Recently, this has included discrimination against individuals on the basis of sexual orientation with numerous papers identifying the existence of a wage gap between gay and heterosexual workers.

Though the presence of discrimination against members of minority groups proves difficult to identify empirically, the persistence of the wage gap against gay men is consistent with the existence of discrimination. The mechanism driving this wage gap, however, is not completely understood as multiple forms of discrimination could contribute to the existence and persistence of a wage gap. Customer-based discrimination offers one explanation to the source of these observed effects.

Customer-based discrimination occurs when a firm's customers have preferences toward the type of individuals with whom they interact. Since customers prefer not to interact with individuals from a minority group, the customer will spend less money, or partake in fewer transactions with firms who hire minority workers in roles where customer

interaction is necessary. Thus, otherwise equally productive employees across different classes become imperfectly substitutable, as race, gender, or sexual orientation become components of productivity. Consider two workers, one of type A, the majority group, and one of type B. Suppose Worker A and Worker B are identical in every way (level of human capital, skills, etc.) with the exception of their type. In the presence of discriminating customers, a profit-maximizing employer would prefer hiring Worker A to Worker B, and would only hire Worker B at a lower wage. As a result a wage gap will emerge, as minority workers choosing to work in occupations that interact with customers will do so at a lower wage than their majority counterparts. Simultaneously, minority workers without a strong preference for occupations that interact with customers will sort away from these jobs to avoid the wage penalty. To find evidence of this effect, I will look at variation in the concentration of gay workers in customer-service jobs across the country as evidence of customer-based discrimination.

This is the first paper examining customer-based discrimination on the basis of sexual orientation. I examine the prevalence of this discrimination against gay workers by observing how choice of occupation is affected by state-level distaste for homosexuality. To this end, I construct a novel index describing the prevalence of discriminatory attitudes by state between 2006-2010. Under multiple specifications, I see if gay workers will choose less interactive jobs in places where attitudes towards homosexuality are more unfavorable.

I find evidence that discriminatory attitudes toward homosexuality impact the likelihood a gay man works in a customer-service occupation consistent with the presence of customer-based discrimination. Approximately 24% of gay men in my sample work in customer-service jobs.<sup>1</sup> Using an individual-level Probit analysis, I find a statistically significant average marginal effect suggesting that if a state decreased its unfavorable attitude by a level equivalent to a one standard deviation change in my constructed index, a gay man would be 0.96% more likely to work in a customer-service job. This effect varies between groups based on age, race, and educational attainment, most notably with college graduates appearing to have the strongest sensitivity to discriminatory attitudes. To reinforce these findings, I employ a strategy to analyze aggregate state-level data which yields results suggesting the overall sorting of gay workers between customer service and non-service occupations is effected by levels of distaste for homosexuality. Consistent with a preponderance of the sexual orientation discrimination literature, I find no effect on lesbian workers across any specifications.

## **II. Review of Literature**

Over the last twenty years, a number of empirical papers have emerged quantifying and explaining a wage gap between gay and heterosexual workers [Badgett (1995), Clain and Leppel (2001), Allegreto and Arthur (2001), Berg and Lien (2002), Antecol, Jong, and Steinberger (2007)]. Most studies, however, find that while a labor market penalty exists for gay men, lesbians are paid a labor market premium. Klawitter (2015) offers a meta-

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<sup>1</sup> A customer-service job is defined as an occupation in the top quintile of jobs ranked by “Importance of Working with the Public” according to O\*NET, more information on this definition will follow.

analysis summarizing 34 studies with gay men finding an average wage penalty of 11% and 29 studies with lesbians finding an average wage premium of 9%.

Different researchers have explained the causes of the wage gap differently. For example, Badgett (1995) argues that non-conformity of gender roles among gay individuals explains the difference in pay, while Berg and Lien (2002) argue it is the differences in budget constraints between gay and heterosexual couples that leads to an income effect altering labor market outcomes. Antecol, Jong, and Steinberger (2007) attempt to explain the gap empirically, and though they find some evidence of differential levels of human capital, particularly education, and occupational sorting differences, they conclude that the “entire wage penalty suffered by gay men relative to their married counterparts was largely unexplained.” Consequently, my paper contributes to this understanding by identifying the existence of customer-based discrimination on that basis of sexual orientation suggesting it could play a role in the existence of a wage penalty.

While customer-based discrimination against gay and lesbian workers has not been explored, there are existing papers examining the extent of customer-based discrimination against racial minorities [Holzer and Ihlanfeldt (1998), Leonard, Levine, and Giuliano (2007), Kahn and Sherer (1988)]. Holzer and Ihlanfeldt (1998) found that discrimination against minority workers was greater in occupations that require more interaction with customers, suggesting different occupations lead to different levels of discrimination and employment outcomes. I explore a similar effect by examining the

extent to which customer-based discrimination effects the occupation sorting choices of gay workers versus their heterosexual counterparts.

Though not identifying customer-based discrimination specifically, Allegreto and Arthur (2001) and Ahmed, Andersson, and Hammarstedt (2015) find that labor market outcomes for gay men and lesbians vary geographically. Specifically, Ahmed, Andersson, and Hammarstedt found that relative employment and earnings are worse for gay men and lesbians living in areas where public opinion toward homosexuality is more negative. This suggests that geographical variation in public opinion likely leads to variation in the of labor market discrimination. My results reinforce this finding as I exploit the variation in attitudes towards homosexuality in the United States to identify the presence of customer-based discrimination.

### **III. Data**

#### *1. Individuals*

A prominent issue in any empirical study addressing labor market outcomes for gay men and lesbians is identifying the gay individuals themselves. Though the American Community Survey (ACS) never directly indicates the sexual orientation of an individual, it allows a researcher to identify same-sex couples. Amongst the choices listed for “relationship to head of household” is unmarried partner. When both the head of the household and partner are the same gender, they are classified as a same-sex couple. This is the method that has been used frequently in the literature. Though this exercise



limits analysis to a sample of individuals in cohabitating same-sex relationships, Carpenter (2012) suggests that this methodology yields similar results to self-reported or behavioral measures of homosexuality when investigating the sexual orientation wage gap. To mitigate biases resulting from this problem, only heterosexuals in committed relationships are kept in the sample as a comparison group. Black et al. (2007) and Gates and Steinberger (2010) draw attention to measurement error in the reallocating of same-sex couples in the ACS. When mailed in responses list two individuals of the same sex as married, the ACS automatically recodes them as cohabitating partners. As a result, many individuals who made an error in listing their sex are miscoded as gay cohabitating partners. Gates and Steinberger suggest eliminating this measurement error by omitting the subset of individuals exposed to the reallocation; this study uses their suggested procedure.<sup>2</sup> This procedure requires limiting analysis to the ACS after 2005, thus 2006<sup>3</sup> is used as the first year for this study.

Using the criteria above, I divide the remaining ACS observations for 2006-2010 into four groups: gay men, heterosexual men, lesbian women, and heterosexual women.<sup>4</sup> I

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<sup>2</sup> All observations that are both flagged as having been changed by the ASC and were recorder via mail-in response are omitted from the sample.

<sup>3</sup> Attitude data from GSS is only available every other year so 2006 is the first year suitable under the procedure suggested by Gates and Steinberger (2010).

<sup>4</sup> Demographic characteristics (e.g. age, race, education) as well as state of residence, and occupation using OCC1990, the 1990 version of the census occupational classification scheme, are also obtained from the ACS.

retain only employed individuals making more than \$2 per hour<sup>5</sup> and less than \$250 per hour as is typical in the wage discrimination literature.

## *2. Job Tasks*

The next step is to identify the level of customer interaction necessary for each occupation. The US Department of Labor's Occupational Information Network, O\*NET<sup>6</sup>, provides data regarding the mix of skills and tasks necessary in various occupations. One such piece of information collected by the 2012 O\*NET database is the importance of "performing for or working directly with the public" for each occupation in the O\*NET registry. For example, a bartender is rated a 96 on O\*NET's 0-100 scale, whereas a database administrator is rated a 5. The ten occupations with the most observations in the full sample of individual observations are listed along with their O\*NET score as Table 1.3. This information is matched with individual's occupations in the ACS data, thereby providing the importance of public interaction for each individual in my ACS subsample.

## *3. Attitudes Towards Homosexuality*

The last crucial piece of data is information regarding attitudes towards homosexuality across the United States. For this, I construct a novel index using survey questions from The General Social Survey (GSS) on attitudes toward homosexual behavior and gay

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<sup>5</sup> Hourly wage calculated as pretax income divided by the product of weekly hours worked and weeks worked.

<sup>6</sup> O\*NET is publicly available and widely used in labor economics for identifying job tasks of occupations, [www.onetonline.org](http://www.onetonline.org).

individuals as well as selected polls from Pew, Newsweek and the New York Times on opinion of gay marriage.<sup>7</sup> The information obtained from these questions is collapsed at the state-year level<sup>8</sup>. This provides me with the share of each state that answered these questions in such a way to imply no distaste for homosexuality during each year of the study.

All variables provide insight into attitudes towards gay individuals, but each variable is highly correlated with the others and therefore somewhat redundant. Therefore, principal component analysis is used to reduce the dimensionality of the attitude data and eliminate this redundancy. Principal component analysis uses an orthogonal transformation to convert the set of highly correlated variables to a set of linearly uncorrelated factors, or principal components. Since the surveys used in the analysis are not precisely consistent over each year, the principal component analysis transformation is performed on each year's observations individually. For all years, only the first principle component is retained for further analysis. Thus, the principle component analysis yields a zero-centered comprehensive index of attitude toward homosexuality using information from each of the surveys used. The index scores the most gay friendly state-year observations high, and the state-year observations with the strongest distaste for homosexuality the lowest. The index ranges from a maximum of 3.513 (Maine in 2010) to a minimum value of -4.709 (Arkansas in 2008).

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<sup>7</sup> See Appendix 1.1 for full information on surveys used.

<sup>8</sup> Though the GSS makes this data public, individual respondents are only geographically identified at the regional level. State-level data may only be obtained through an application for GSS sensitive data.

Table 1.2 displays each state's index value for attitudes toward gay individuals in 2006, 2008, and 2010. Eleven states in the GSS sample contained no observations; those states are not used in the study.

Table 1.1 provides summary statistics for all the individuals in the sample with the four groups split between those living in high-discriminating states, and in low-discriminating states.<sup>9</sup> Compared to their heterosexual counterparts, gay men appear to be younger and have much fewer children. As a result of the ACS coding married gay couples as being unmarried partners, no gay men are married, whereas, 92% of the heterosexual men are married. Gay men have much more education than heterosexual men; while 46% of gay men living in high-discriminating states and 54% of gay men living in low-discriminating states<sup>10</sup> have graduated college those totals are only 33% and 38% for heterosexual men. The mean "Importance of Working with the Public" statistic for gay men is 57.60 and 57.77, around five percentage points higher than that of their heterosexual counterparts. The last row of Table 1.1 provides a preview of the results of this paper as 18% of heterosexual men work in the customer service sector in both high- and low-discriminating states, meanwhile, 23% of gay workers in high-discriminating states and 25% of gay workers in low-discriminating states are in the customer service sector. This suggests that in general, gay men are more likely to work in customer service jobs across

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<sup>9</sup> High discriminating is defined as below zero on the discrimination index low discriminating is above zero

<sup>10</sup> Graduating college is calculated as having four or more years of college education.

the country, but they are even more likely to be found in the customer service sector in areas with less discrimination.

Lesbian women and heterosexual women display a similar pattern in the data. Lesbian women are younger, have fewer children, and, as discussed above, are never listed as married in the data. Once again, lesbian women obtain significantly more education than their heterosexual counterparts. Where 45% of lesbian women living in high-discrimination states and 55% of lesbian women in low-discrimination states have college degrees, only 34% and 38% of heterosexual women graduate college. Like with gay men, lesbian women appear to be more likely to work in the customer service sector, though the geographic difference is not present.

#### **IV. Theoretical Framework**

Consider a two-sector model where the economy is segmented into the customer service sector and the non-service sector (subscripts C and N)<sup>11</sup>. Each sector produces one good using a Cobb-Douglas production function with constant returns to scale. Each sector may employ as many workers who choose to work in that sector. Consider also the economy has two types of workers, heterosexual workers and gay workers (subscripts H and G).

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<sup>11</sup> Similar to the model introduced by Kahn (1991)

$$Q_C = K_C^{1-\alpha}(L_{CH} + (1 - D)L_{CG})^\alpha$$

$$Q_N = K_N^{1-\beta}(L_{NH} + L_{NG})^\beta$$

$$0 \leq D \leq 1$$

Here,  $D$  is the share of consumers who refuse interactions with gay workers in the service sector. If  $D = 0$ , the gay and heterosexual workers are perfect substitutes in both the service sector and non-service sector. If  $D = 1$ , gay workers are unproductive in only the customer service sector ( $MPL_{CG} = 0$ ).

The perfectly competitive industries each pay workers according to their marginal revenue product of labor. The following equations illustrate the wages received by each type of worker in each sector:

$$w_{CH} = P_C * MPL_{CH} = P_C * \alpha K_C^{1-\alpha}(L_{CH} + (1 - D)L_{CG})^{\alpha-1}$$

$$w_{NH} = P_N * MPL_{NH} = P_N * \beta K_N^{1-\beta}(L_{NH} + L_{NG})^{\beta-1}$$

$$w_{CG} = P_C * MPL_{CG} = P_C * \alpha K_C^{1-\alpha}(L_{CH} + (1 - D)L_{CG})^{\alpha-1}(1 - D)$$

$$w_{NG} = P_N * MPL_{NG} = P_N * \beta K_N^{1-\beta}(L_{NH} + L_{NG})^{\beta-1}$$

$$w_{NH} = w_{NG} = w_N$$

We can then define variables to represent the relative wages between the two sectors for each type.

$$\frac{w_{CH}}{w_N} = \omega \quad \frac{w_{CG}}{w_N} = \omega(1 - D)$$

Consider now the choice made by individual  $i$  (of either type) to sort into the different sectors.

$$H: \text{Max}[U(w_N, \varphi_{Ni}), U(w_{CH}, \varphi_{Ci})]$$

$$G: \text{Max}[U(w_N, \varphi_{Ni}), U(w_{CG}, \varphi_{Ci})]$$

The utility function  $U$  is increasing in both arguments.  $\varphi_{Ni}$  represents some level of personal utility gained by individual  $i$  if he works in the non-service sector,  $\varphi_{Ci}$  is the utility gained from working in the customer service sector.

Define  $\psi_i = \frac{\varphi_{Ci}}{\varphi_{Ni}}$ , or individual  $i$ 's relative preference for working in the customer-service sector. If  $\psi_i > 1$ , individual  $i$  would work in the service sector if wages were equal.

Normalize  $\varphi_{Ni} = 1$ ,  $w_N = 1$ , and  $U(w_N, \varphi_{Ni}) = \theta_i$ . So  $\theta_i$  is the utility individual  $i$  would receive from working in the non-service sector.

Then a heterosexual individual will work in the service sector if  $U(\omega, \psi_i) > \theta_i$

And a gay individual will work in the service sector if  $U(\omega(1 - D), \psi_i) > \theta_i$

The probability a gay individual will work in the customer service sector depends on the level of discrimination  $D$ . To be precise, since a gay individual's utility obtained from working in the customer service sector is decreasing in  $D$ , as  $D$  increases, a gay worker is less likely to work in the customer service sector. Meanwhile the probability a heterosexual individual will work in the customer service sector does not depend on  $D$ . Therefore, as  $D$  increases, the number of gay workers in the customer service sector will drop, even if the number of heterosexual stays constant, thereby decreasing the gay share of the customer service sector. Simultaneously, as an increase in  $D$  will increase the probability a gay worker will switch to the non-service sector, the gay share of non-service sector will increase with  $D$ .

## **V. Methods**

To estimate the impact the variation in attitudes towards homosexuality have on job sorting decisions, I employ three main specifications. First, I perform Probit analysis at the individual-level estimating the effect variation in attitudes have in the probability a gay worker will have an occupation in the customer service sector. Second, I use OLS to investigate the impact the discriminatory attitudes have on the level of customer service at an individual's job. Third, I execute an aggregate strategy to investigate the relationship between a state's attitudes towards homosexuality and the aggregate state-level sorting of workers between the service and non-service sectors. In each estimation, I include year and state fixed effects so the identified effect comes from variation of attitudes towards homosexuality within each state over the time period studied.



### *1. Probit Estimation*

The first of the three main specifications is the Probit estimation performed at the individual level. Here, I estimate the effect of distaste for homosexuality on the probability an individual works in the customer service sector.

For this estimation strategy, I need to define what it means for a job to be a customer service job. With no clear definition existing in the literature, I am left to choose from a variety of seemingly arbitrary cutoffs of the Working with the Public measure obtained from the O\*Net database. For the main results I define a customer service job as an occupation where the importance of customer service is in the top quintile of all jobs, and a non-service job is all other occupations. Later, I replicate the estimation using a variety of cutoffs, and will discuss the overall sensitivity to the cutoff in the results section.

The dependent variable in this estimation is a binary variable signifying if the individual works in the customer service sector. The variable of interest here is the interaction of the geographic attitude toward homosexuality with an indicator variable signifying the individual is gay. The full estimation equation is as follows:

$$CS_{its} = \beta(Gay \cdot Att)_{its} + \gamma Gay_{its} + \delta Att_{ts} + \delta X_{its} + \theta Year_t + \eta State_s + \epsilon_{its}$$

$CS_{its}$  indicates that individual  $i$  works in the customer service sector.  $Gay_{its}$  is a dummy variable indicating if a person is gay.  $Att_{ts}$  is the state-year measure of attitude toward homosexuality. Lastly,  $X_{its}$ <sup>12</sup> is a vector of observable individual-level variables such as education and age.

Here, the theoretical model predicts a negative relationship between discriminatory attitudes and the probability of working in the customer service sector for a gay worker. Recall, the attitude index obtained from the principle component analysis rates a strong distaste for homosexuality with a low value, and more favorable attitudes with a high value. This implies the model predicts a positive marginal effect should be observed. This marginal effect would imply gay workers in state-year observations where homosexuality is met with more favorable attitudes are more likely to sort into interactive occupations compared to those in observations showing greater distaste.

## 2. OLS Estimation

The OLS estimation is very similar to the Probit method used above. However, in the OLS method, the importance of working with the public at an individual's job is the variable of interest. Rather than setting a binary choice (customer service or non-service) this method suggests that discriminating customer behavior could influence an individual to sort into an occupation with less interaction with the public.

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<sup>12</sup> Covariates are age, race, education, number of children, married, migrant status (a migrant is defined as in individual whose state of birth and residence do not match) and metropolitan status.

Now, the following is the OLS estimating equation:

$$\begin{aligned} WorkingWithPublic_{its} = & \beta(Gay \cdot Att)_{its} + \gamma Gay_{its} + \\ & \delta Att_{ts} + \delta X_{its} + \theta Year_t + \eta State_s + \epsilon_{its} \end{aligned}$$

Here the outcome variable, *WorkingWithPublic*, is the importance of working directly with the public in individual *i*'s job on a scale of 0 – 100. Once again, the theoretical model predicts a positive estimated coefficient on the interaction term.

### 3. State-Year Level Estimation

For the final main estimation strategy, I construct what I will call the sorting ratio. This compares the ratio of gay workers to heterosexual workers in the customer service sector to the ratio of gay workers to heterosexual workers in the non-service sector. Let  $L_{CGst}$  be the number of gay workers in the customer service sector in state *s* at time *t*,  $L_{CHst}$  is the number of heterosexual workers in the customer service sector and  $L_{NGst}$  and  $L_{NHst}$  represent the non-service sector. Then define  $\xi_{Cst}$  as the ratio of number of gay employees in customer service to the number of heterosexuals in the customer service sector,  $\xi_{Cst} = \frac{L_{CGst}}{L_{CHst}}$ . Similarly  $\xi_{Nst} = \frac{L_{NGst}}{L_{NHst}}$  is the ratio for the non-service sector. Lastly define  $\rho_{st}$  as the sorting ratio in state *s* at time *t*,  $\rho_{st} = \frac{\xi_{Cst}}{\xi_{Nst}}$ . By defining this sorting ratio like this,  $\rho_{st}$  is not affected by changes in the total amount of gay workers in state *s* at time *t*, the total amount of heterosexual workers, the size of customer service sector, or

the size of the non-service sector, as long as the proportions are fixed. Instead,  $\rho_{st}$  is only affected by relative changes in these levels.

I will then use OLS to estimate the impact attitudes towards homosexuality, measured by the attitude index, has on the sorting ratio. The theoretical model predicts that an increase in the level of distaste for homosexuality will decrease the probability a gay worker sorts into the customer service sector while not changing the sorting decisions of heterosexual workers. Therefore, the model predicts an inverse relationship between the level of distaste and the sorting ratio.

In order to construct  $\rho_{st}$  the customer service and non-service sectors need to be defined, once again. As with the Probit estimation, I will define a customer service job as one in the top quintile of all jobs in importance of working with the public, additional cutoffs will be discussed in the results section.

With these definitions in mind, the full estimation equation for the state-year level analysis is as follows:

$$\rho_{st} = \beta Att_{st} + \gamma State_s + \delta Year_t + \epsilon_{ts}$$

Here,  $Att_{st}$  is defined as the attitude toward homosexual in state  $s$  at time  $t$ . The theoretical model predicts a positive relationship between  $\rho_{st}$  and  $Att_{st}$ , or  $\beta > 0$ .

One of the advantages of the state-level aggregate methodology, is that by collapsing the data into state-year bins, we are left with significantly fewer observations than with the individual-level analysis. As a result, the relationship between the variables can be observed with figures such as Figure 1.1, the scatter plot of the attitude index and the sorting ratio defined above. As predicted, the variables do display the aforementioned positive relationship. In addition, Figure 1.2 displays two maps displaying the varying level of the attitude index and sorting ratio averaged by state.

## **VI. Results**

### *1. Probit Estimation*

Table 1.4 displays the results from the individual-level Probit regressions. The first specification represents the Probit analysis performed with only the attitude index, the indicator variable signifying if an individual is gay, and the interaction of the two. The additional specifications included individual covariates as well as year and state fixed effects.

The initial specification for men yields a marginal effect<sup>13</sup> of 0.0078 on the interaction between the attitude index and the dummy variable indicating the individual is gay. The positive marginal effect agrees with the theoretical model prediction suggesting gay men

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<sup>13</sup> All marginal effects reported in this paper are average partial effects.

are less likely to work in customer service jobs in states with more unfavorable attitudes towards homosexuality compared to their heterosexual counterparts or gay men living in less discriminatory states. This estimate is robust to the inclusion of state and year fixed effects, but drops to 0.0055 when I include a vector of individual level covariates. The marginal effect of 0.0055 implies that a one standard deviation<sup>14</sup> increase in the attitude index would increase the probability of a gay man working in the customer service industry by 0.96% or, in a more extreme case, if the attitude level observed in Tennessee in 2010 (-3.326) was replaced by the attitude level of Maine in 2010 (3.583), the probability of a gay man sorting into the customer service sector would increase by 3.8% (.0380).

Across every specification the estimated effect of the impact of attitudes on the sorting decision of lesbian women is not statistically different from zero. This implies that while gay men display occupational sorting consistent with the theory of customer discrimination, lesbian women either do not face the same level of discrimination, it plays little to no role in their sorting decision, or the impact is not being properly detected by this analysis. Herek (2000) finds surveyed heterosexual men display attitudes towards gay men that “are consistently more hostile” than their attitudes towards lesbians, but no differences in attitudes from heterosexual women. This suggests it may not be the level of discrimination, but intensity of the discrimination that drives different results between gay men and lesbians. Another possibility is that the discrimination index is ineffective

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<sup>14</sup> Standard deviation of attitude index is 1.758.

in summarizing discriminatory attitudes towards lesbians. In three of the survey questions that inform the index, the question specifically asks about gay men. If opinions about gay men greatly differ from opinions of lesbian women, the constructed index is not accurate in describing discrimination towards lesbian women.

## *2. OLS Estimation*

The OLS estimates with “Importance of Working with the Public” as the outcome variable, reported in Table 1.5, display coefficients not statistically different from zero across all specifications. The lack of statistically significant results from the OLS estimate combined with the Probit results suggest that while discriminatory attitudes affect the sorting decision of gay men, this effect is not seen through the whole distribution of jobs. In other words, gay men may sort from a customer service job to a non-service job, but within sectors, they are not shifting to jobs with even less customer interaction. To examine this effect further, I split the sample into individuals who work in jobs in the top half of the distribution of “Importance of Working with the Public” and those in the bottom half. Table 1.6 displays the results from this split sample. When only considering individuals from the bottom half of the distribution there is still no observed effect, however, the estimated effect for the top of the distribution is positive and statistically significant. The point estimate of 0.3175 implies that with a one standard deviation increase in the attitude index we expect to observe the customer interaction at the jobs of a gay man in the top half of the distribution of all jobs to increase by an average of 0.56 points on a 0-100 scale, or by 2.19 if the attitude level of Tennessee in

2010 was replaced by the attitude level of Maine in 2010. Though the interpretation of this point estimation is convoluted, the interpretation is consistent with the theoretical model I presented. The implication of this result, combined with the Probit results, imply that the effect of discriminatory attitudes push individuals in and out of customer service jobs (those near the top of the distribution of “Importance of Working with the Public”) and have no effect on individuals already in the bottom of the distribution. Once an individual is in a non-service job, discriminatory attitudes do not push him into jobs with even less interaction.

In both Tables 1.5 and 1.6 we once again see the estimated coefficients for women are not statistically different from zero. As in the Probit estimation, this implies that the sorting decision of lesbians is not influenced in the same way as the observed effect on men.

### *3. State-Year Level Estimation*

Table 1.7 presents OLS results for the state-year estimation method. Here, the estimated coefficient with the inclusion of both state and year fixed effects is 0.1381 suggesting a one standard deviation increase in the attitude index would increase a state’s sorting ratio by 0.2428 or an 18% increase for the median state-year observation<sup>15</sup>.

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<sup>15</sup> Median state-year observation for sorting ratio is 1.3237.



Another way to interpret this coefficient is to consider an individual high-discrimination state. For example, Georgia in 2010 has a value of -2.361 on the index. Given the estimated coefficient, a movement to the mean level of discrimination would increase the sorting ratio for Georgia by 0.3261. In the 2010 sample, an increase of 0.3261 in the sorting ratio could be achieved by moving approximately four gay men from the non-customer service sector to the customer service sector<sup>16</sup>. Given the average person weight in the sample is 96, this suggests that the excess distaste for homosexuality above the mean in Georgia in 2010 is responsible for just under 400 people working in the wrong sector.

This result reinforces the hypothesis that geographic variation in attitudes towards homosexuality influences the job sorting of gay men. As was true in the individual-level specifications, no effect is detected for lesbians.

#### *4. Heterogeneous Effects*

Tables 1.8, 1.9, and 1.10 break the sample into groups to analyze if the estimated effect varies between these groups. In each case, the table reports the estimated effects from the Probit analysis performed with year fixed effects, state fixed effects, and the vector of covariates.

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<sup>16</sup> Georgia in 2010 has 106 total gay men in the sample.

Table 1.8 splits the sample by age into two groups, those thirty years old and under, and those over thirty. Though it seems like it would be possible that the effect identified in the main results for gay men would be driven by younger workers, as it seems more likely they would adjust their careers to perceived discrimination, this is not the case. The estimates reveal a positive, but not statistically significant estimate for the younger group and a higher, and statistically significant, estimate for the older group. This result is likely driven by the fact that the sample included in this study is only cohabitating individuals. As a result, the younger subsample is much smaller, and since cohabitation is our only tool for identifying gay workers, the younger subsample is likely less accurate in representing the full population of gay workers.

When splitting the women's sample by age, neither the older nor younger subsample reveal marginal effect statistically different from zero.

Table 1.9 splits the sample by race into four groups, white, black, Asian, and Hispanic. For men, a positive marginal effect was estimated for each racial group, but only the estimated marginal effect for white men was statistically significant. The point estimate of the marginal effect of discrimination for black gay men is more than twice as high as the estimate for the entire sample or the white subsample. Though noisy, the large point estimate could be telling of more acute discrimination felt by black gay men versus their white counterparts. The parts of the country that exhibit unfavorable attitudes towards homosexuality tend to be the same as those that exhibit unfavorable attitudes towards

blacks, so it is possible that the discrimination towards gay men is compounded with discrimination against blacks, making gay black men the most susceptible to customer-based discrimination. This finding is consistent with findings from Douglas and Steinberger (2015) who found “a magnifying effect of double minority status penalizing black gay workers” while examining the racial component of the sexual orientation wage gap, though they also found a similar effect for Hispanic gay men.

Once again, no statistically significant estimates for women are detected, however, as with gay men black lesbians display a noisy but very high point estimate. Unlike the finding with gay men, this result contradicts Douglas and Steinberger’s (2015) finding which identifies a positive wage interaction between sexual orientation and racial minority status for women.

Finally, Table 1.10 displays the heterogeneous effects across levels of education. For men, we observe the first negative statistically significant coefficient when observing the effect for those with less than twelve years of education. This suggests that for gay men with less than high school education, the effect is backward, with them more likely to work in customer service jobs in discriminatory states. It is important, however, to note that the sample of gay men with less than high school education is very small with only 315<sup>17</sup> observations in the entire sample.

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<sup>17</sup> 3% of gay male sample.

Meanwhile, the estimated effect for high school graduates and those with some college are similar to the full sample, but the estimated effect for college graduates is much higher. This marginal effect is more than three times as large as the estimated effect of the entire sample. For the college graduate sample the marginal effect of 0.0184 suggests that a one standard deviation increase in the attitude index would increase the probability of a gay man working in the customer service industry by 3.2%. This suggests that individuals with a college education are responsible for driving the observed occupation sorting response to discrimination. This could be due to an expanded set of occupational choices by college graduates. The theoretical model suggests individuals choose between service and non-service jobs. If individuals with less education, and therefore less valued in the labor market, are less likely to obtain multiple job offers, less job sorting would be observed regardless of the prevalence of discrimination.

Another possible explanation is that college graduates are more mobile than individuals that obtain less education. If gay men with a preference for customer service work are more likely to move to a state with less discriminatory attitudes than their less educated counterparts, it could drive these results. To test the effect of selective migration, I split the sample of all gay men into migrants and non-migrants. The results from this analysis are reported as Table 1.11. Here, migrants are defined as people whose birth state recorded in the ACS does not match their current state of residence. The estimated effect for the migrant group is slightly higher than the entire sample, but is nowhere near as large as the college graduate subsample. So while this should be examined further in

future work, I do not believe that selective migration is solely driving the effect on college graduates.

### *5. Placebo Tests*

As a placebo test, I use additional O\*NET job tasks to see if the geographic variation in attitudes towards homosexuality correlate to any other occupational sorting for gay men. If an impact is observed, it would imply that the result detected in the main analysis is picking up some other differences between gay men in different parts of the country, unrelated to discriminatory attitudes. Table 1.12 displays those results for three tasks, Analyzing Data or Information, Telephone Use, and Computer Knowledge. Just as was observed with customer service tasks, all of these three variables have a strong positive marginal effect on the indicator variable that an individual is gay. The marginal effect on the interaction term, however, is close to zero and statistically insignificant for all three tasks. This suggests, as one would expect, individuals are not sorting into jobs with these tasks as a result of discrimination on the basis of sexual orientation.

Table 1.13 follows the same technique as above replacing the importance of “Performing for or Working Directly with the Public” with importance of “Work with a Work Group or Team”. Unlike the three task displayed in Table 1.12, there is reason to believe this task would display a relationship with discriminatory attitudes. An alternative source of discrimination that could inflict harm on gay workers is coworker discrimination. Here, instead of discriminatory attitudes of customers causing negative labor market outcomes

for gay workers, it is the attitudes of potential coworkers. If a gay individual is hired at a firm that employs discriminatory workers, these workers could refuse to work alongside the gay worker, they could leave the firm, or their distaste could impede their productivity. If this is the case, a discriminatory workforce would make otherwise identical gay and heterosexual workers imperfect substitutes in much the same way discriminatory attitudes of customers would. As illustrated in Table 1.13, the estimated marginal effects on the likelihood of being in an occupation with high levels of teamwork<sup>18</sup> are similar in magnitude to the customer service estimates. While these estimates are larger than the estimates associated with the tasks in Table 1.12, they are not statistically significant. As a result, I cannot conclude the presence of coworker discrimination exists within the same pattern as the detected customer-based discrimination.

A second placebo test replaces the index on attitudes towards homosexuality with an index constructed from GSS questions pertaining to attitudes towards blacks.<sup>19</sup> This could hypothetically show that the perceived effect is driven more by comprehensive discriminatory attitudes, and not specifically on distaste for homosexuality. Table 1.12 reports the results from using this alternative index; none of the estimated effects are statistically different from zero.

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<sup>18</sup> The top quintile is used here to mirror the main results for the customer service task.

<sup>19</sup> Questions include whether the respondent would favor a relative marrying a black person, feels blacks are unmotivated, and feels blacks need to work their way up without favors.

### *6. Robustness to Other Cutoffs*

Figures 1.3 and 1.4 show the change in estimated effect when the definition of customer service sector is changed in the Probit and state-level aggregate analyses respectively. In the Probit analysis, the point estimate on the marginal effect of discriminatory attitudes is positive whether the service sector is defined as an occupation above the 70<sup>th</sup> percentile through the 90<sup>th</sup> percentile. The estimate stays relatively steady and statistically significant when the cutoff is defined between the 79<sup>th</sup> and 85<sup>th</sup> percentiles. When the cutoff is defined higher than the 85<sup>th</sup> percentile, the point estimate begins to attenuate toward zero.

Figure 4 shows the same graph for the state-level analysis, with similar results. Here the estimated coefficient is robust for any cutoff between the 75<sup>th</sup> and 83<sup>rd</sup> percentiles. Once again, however, for the rest of the distribution, though the point estimates are consistently positive, they are not statistically significant and the estimated coefficients attenuate as the cutoff gets too high.

Though the precision of the estimates vary between cutoffs with either methodology, the direction and magnitude of the estimates remain relatively stable. Though it is still not clear, which cutoff is ideal, this evidence suggests discriminatory attitudes are affecting the choices of some gay workers to sort into or away from the top of the customer interaction distribution.

## **VII. Conclusions**

Using data on individuals from the 2006-2010 American Community Survey in conjunction with an index I constructed displaying state-level attitudes toward homosexuality, I show that gay men appear to sort away from customer service jobs in areas where there is greater distaste for homosexuality. This impact is evident when using Probit analysis to see the effect of unfavorable attitudes on the probability a gay man works in the customer service sector and when using state-year level observations to test the relationship between attitudes and the overall job sorting of gay men compared to their heterosexual counterparts. Since gay men living in parts of the country with negative attitudes towards homosexuality are exposed to discrimination and labor market penalties, they are more likely to sort into jobs where interaction with customers is less important.

Heterogeneous sorting is observed when the sample is split by race, and strong effects when it is split by education. Specifically, while little evidence is seen that Asian or Hispanic gay men display the sorting I observe for whites, black gay men appear to be exposed to more discrimination and are more affected by unfavorable attitudes. In addition, the results in the main specification appear to be mostly driven by college educated gay men whose response to discrimination appears to be greater.



Although this effect is present when looking at the sorting decision of gay men, it is not observed when looking at lesbian women. This finding is consistent with much of the literature about sexual orientation discrimination in the labor market where much of the negative outcomes of discrimination are identifiable when investigation outcomes from men, but not for women.

Customer service jobs, on average, pay higher wages than non-service jobs.<sup>20</sup> In general, gay men are more likely to work in customer service jobs than heterosexual men. This could be because gay men have a stronger preference for these jobs, have a different set of skills better suited to these jobs, because more education provides greater access to these jobs, or more likely a combination of all three. My findings suggest, while gay men are more likely to work in these jobs, this sorting is countered by customer-based discrimination pushing some gay men away from the service sector. While other forms of discrimination may be competed away in a competitive economy, a model of customer-discrimination predicts harm to minorities as a result of profit-maximizing behavior, so these effects will persist as long as discriminatory attitudes persist. As of 2016, statewide non-discrimination laws cover sexual orientation in only twenty-three states and the District of Columbia<sup>21</sup>. Evidence shows that distaste for homosexuality in the United States is waning over time. This suggests that the harm inflicted by customer-based discrimination may eventually dissipate; an effort to expand non-discrimination laws, however, could be effective in accelerating that process.

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<sup>20</sup> The customer service wages are 28% higher in my sample when using the top quintile as the cutoff.

<sup>21</sup> CA, CO, CT, DC, DE, HI, IL, IA, ME, MD, MA, MN, NV, NH, NJ, NM, NY, OR, RI, UT, VT, WA, WI

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## Appendix 1.1 – Attitude Index

The following four questions are asked on the GSS and used in my analysis.

1. “What about sexual relations between two adults of the same sex—do you think it is always wrong, almost always wrong, wrong only sometimes, or not wrong at all?”

(Questions 2-4 use the same pre-question text, “And what about a man who admits that he is a homosexual?”)

2. “Suppose this admitted homosexual wanted to make a speech in your community. Should he be allowed to speak, or not?”
3. “Should such a person be allowed to teach in a college or university, or not?”
4. “If some people in your community suggested that a book he wrote in favor of homosexuality should be taken out of your public library, would you favor removing the book, or not?”

In addition to the GSS data, state level averages from the following questions on the following surveys/tables are used:

“Do you strongly favor, favor, oppose, or strongly oppose allowing gays and lesbians to marry legally?”

– Pew Research Center Poll: June News Interest Index, June 2006

“Do you support full marriage rights for gay and lesbian couples?”

– Newsweek Poll # 2006 – NW07, October 2006

“Do you favor or oppose allowing gays and lesbians to marry legally?”

– Pew Research Center Poll: Pew Social Trends, February 2008

“Do you think their should or should not be legally-sanctioned gay and lesbian marriages?”

– Newsweek Poll # 2008 – NW11, December 2008

“Support for Same-Sex Marriage, State by State”  
– New York Times, August 2010

“Do you strongly favor, favor, oppose, or strongly oppose allowing gays and lesbians to marry legally?”  
– Pew Research Center Poll: Political Independents, September 2010

## **Appendix 1.2 – Alternative Attitude Indices**

Table A1.2 replicates the main probit estimation results with alternative attitude indices.

The main results employ an index that includes poll questions regarding public opinion on same-sex marriage. While it certainly makes sense that an individual's feeling towards same-sex marriage is highly correlated with overall attitude toward homosexuality, there may be exceptions. Over the past several years the political debate surrounding same-sex marriage has largely followed political party lines.<sup>22</sup>

Consequently, it could be that for many individuals their responses to questions about same-sex marriage are more informed by their political affiliation than with actual attitudes towards gay and lesbian individuals. In the first section of Table A1.2, I employ an index that omits the questions about same-sex marriage. Since responses to the omitted questions largely follow a similar pattern to the GSS attitude questions, the results are very similar. The point estimates grow somewhat in magnitude suggesting this index may be more effective in identifying discriminatory attitudes.

The second section of Table A1.2 expands the aforementioned index by imputing index values for 2007 and 2009, the years covered in this study without GSS surveys. Here, I take the midpoint between the 2006 and 2008 indices to form the 2007 index and match it with 2007 individual data. Similarly, the 2008 and 2010 indices inform the 2009 index. Comparing the results from this estimation with the estimation above, we see very similar results. While the estimates are slightly smaller in magnitude, likely due to the newly

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<sup>22</sup> A 2011 CNN Opinion Research Poll found 64% of Democrats favored legal same-sex marriage compared to 27% of Republicans.

imputed indices not representing attitudes as accurately, the estimates are more precise. The reduced standard errors are likely attributed to the additional power resulting from the extra 800,000 observations afforded by using two more years in the estimation.

Finally, the third section tests for reverse causality by advancing the index by one year. It is possible that a higher concentration of gay individuals working in customer-service jobs leads to diminished discriminatory attitudes by exposing more people to gay individuals. By moving each index forward one year, I can see if the following year's attitudes predict the likelihood a gay man works in the customer-service sector this year, as the reverse causality story would suggest. The results in Table A1.2 show this not to be the case. In each estimation, the marginal effect on the interaction term is not statistically different from zero.

### **Appendix 1.3 – Probit Estimation Correction**

Ai and Norton (2003) point out that when using non-linear models, such as a probit model, the traditionally used marginal effects are incorrect for interaction variables. The nature of interaction variables requires additional arguments to be considered when calculating marginal effects. I incorrectly used ordinary marginal effect techniques when reporting the results in this paper. Table A1.3 shows corrected results for the main probit specification. Corrected results for the heterogenous effect regressions and other supporting estimations will be added soon. Comparing the original results with the corrected results, reported in Table A1.3, shows the results do not change drastically. In each estimation, the marginal effects increase slightly and they maintain statistical significance as they did before. Therefore, the results discussed in this paper should be considered accurate, or at worst a lower bound for the correct estimates, until each estimation is corrected.



Table 1.1: Summary Statistics

	Men			Women			
	High-D States Gay	High-D States Heterosexual	Low-D States Gay	High-D States Lesbian	High-D States Heterosexual	Low-D States Lesbian	Low-D States Heterosexual
Observations	4,073	577,408	5,288	4,161	482,931	5,511	516,907
Age	42.49 (10.86)	45.87 (12.10)	43.07 (10.81)	41.27 (11.03)	44.38 (11.73)	42.55 (11.09)	44.69 (11.55)
HS Dropout	0.03 (0.18)	0.08 (0.27)	0.03 (0.18)	0.03 (0.17)	0.05 (0.21)	0.02 (0.16)	0.05 (0.21)
HS Grad	0.24 (0.43)	0.36 (0.48)	0.19 (0.39)	0.26 (0.44)	0.35 (0.48)	0.21 (0.41)	0.31 (0.46)
Some College	0.26 (0.44)	0.22 (0.42)	0.23 (0.42)	0.26 (0.44)	0.26 (0.44)	0.22 (0.41)	0.26 (0.44)
College Grad	0.46 (0.50)	0.33 (0.47)	0.55 (0.50)	0.45 (0.50)	0.34 (0.47)	0.55 (0.50)	0.38 (0.49)
Married	0.00 (0.00)	0.92 (0.27)	0.00 (0.00)	0.00 (0.00)	0.91 (0.29)	0.00 (0.00)	0.90 (0.30)
Children	0.09 (0.45)	1.08 (1.18)	0.10 (0.48)	0.24 (0.66)	0.97 (1.10)	0.23 (0.65)	1.03 (1.13)
Migrants	0.61 (0.49)	0.48 (0.50)	0.62 (0.48)	0.54 (0.50)	0.45 (0.50)	0.54 (0.50)	0.47 (0.50)
Importance of Working w/ Public	57.60 (17.62)	52.16 (19.95)	57.77 (17.48)	57.63 (17.48)	57.14 (16.76)	57.18 (17.11)	56.86 (16.72)
Service Sector	0.23 (0.42)	0.18 (0.38)	0.25 (0.43)	0.24 (0.42)	0.19 (0.40)	0.24 (0.42)	0.19 (0.39)

Table 1.2: State-Year Attitudes Toward Homosexuality

	2006	2008	2010	Average
Alabama	-1.635	-2.597	-2.182	-2.138
Arizona	0.532	1.901	0.596	1.010
Arkansas	-3.403	-4.709	-3.168	-3.760
California	1.404	0.850	1.241	1.165
Colorado	2.209	0.557	1.614	1.460
Connecticut	0.512	3.345	3.424	2.427
Delaware	2.061	1.363	1.761	1.728
District of Columbia	1.739	2.682	0.128	1.516
Florida	-0.939	-0.815	-0.532	-0.762
Georgia	-1.931	-1.848	-2.361	-2.047
Hawaii	1.766	2.646	0.619	1.677
Idaho	-0.339	-0.138	-1.256	-0.578
Illinois	-1.143	0.713	1.360	0.310
Indiana	0.743	-1.603	1.332	0.157
Iowa	0.367	-1.143	0.154	-0.207
Kansas	0.604	0.352	0.748	0.568
Kentucky	1.809	0.264	0.026	0.700
Louisiana	-2.950	-1.275	-1.920	-2.048
Maine	1.866	0.958	3.513	2.112
Maryland	-0.052	1.855	0.362	0.722
Massachusetts	1.957	1.080	2.580	1.872
Michigan	-1.117	1.237	-0.418	-0.099
Minnesota	1.530	2.312	1.620	1.821
Missouri	-0.940	-2.512	-3.230	-2.227
New Jersey	1.398	0.440	0.411	0.750
New Mexico	2.362	2.606	-0.871	1.366
New York	1.419	1.655	1.861	1.645
North Carolina	-3.325	-2.171	-2.438	-2.645
Ohio	0.082	-1.098	-0.153	-0.390
Oklahoma	-4.385	-0.880	-1.147	-2.138
Oregon	1.201	0.262	2.070	1.178
Pennsylvania	0.214	-0.854	-0.572	-0.404
South Carolina	1.580	0.480	-1.503	0.186
Tennessee	-2.854	-2.408	-3.326	-2.863
Texas	-1.363	-1.646	-1.408	-1.472
Virginia	-2.272	-0.278	0.929	-0.540
Washington	1.111	-0.034	0.696	0.591
West Virginia	-0.050	-2.014	-1.498	-1.187
Wisconsin	1.346	-0.315	-0.784	0.082
Wyoming	-1.113	0.782	1.721	0.463

Alaska, Mississippi, Montana, Nebraska, Nevada, New Hampshire, North Dakota, Rhode Island, South Dakota, Utah, and Vermont had no respondents for the GSS questions, so their observations were omitted.

Table 1.3: Ten Most Common Occupations with O\*NET Rating

Occupation	Importance of Working With Public
Computer Analysts	(7)
Laborers	(26)
Construction Supervisors	(32)
Executives & Public Admins.	(35)
Janitors	(46)
Managers & Administration	(48)
Delivery Drivers	(73)
Supervisors of Sales Jobs	(78)
Retail Sales Clerks	(89)
Salespersons	(95)

Table 1.4: Effect of Attitudes on Likelihood of Working in Customer Service

	Men			
	(1)	(2)	(3)	(4)
AttitudesxGay	0.0078 (0.00328)**	0.0078 (0.00328)**	0.0074 (0.00344)**	0.0055 (0.00331)*
Attitudes	0.0024 (0.00183)	0.0023 (0.00183)	-0.0003 (0.00055)	-0.0003 (0.00056)
Gay	0.0473 (0.00480)***	0.0474 (0.00480)***	0.0449 (0.00498)***	0.0321 (0.00468)***
Year FE	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Individual Covariates	No	No	No	Yes
N	1198641	1198641	1198641	1198641

	Women			
	(5)	(6)	(7)	(8)
AttitudesxGay	0.0021 (0.00325)	0.0021 (0.00324)	0.0022 (0.00323)	0.0032 (0.00315)
Attitudes	-0.0001 (0.00076)	-0.0001 (0.00077)	-0.0006 (0.00073)	-0.0005 (0.00074)
Gay	0.0344 (0.00452)***	0.0344 (0.00452)***	0.0338 (0.00465)***	-0.0005 (0.00499)
Year FE	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Individual Covariates	No	No	No	Yes
N	1009510	1009510	1009510	1009510

Displayed estimate is average marginal effect on probability of working in an occupation with Importance of Working with the Public in the top quintile.

Standard errors clustered at state level

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 1.5: Effect of Attitudes on Importance of Working with the Public

Men				
	(1)	(2)	(3)	(4)
AttitudesxGay	0.0957 (0.13494)	0.0972 (0.13478)	0.0796 (0.13990)	-0.0172 (0.14357)
Attitudes	0.2365 (0.13650)	0.2324 (0.13664)	-0.0188 (0.03390)	-0.0166 (0.03283)
Gay	4.9444 (0.25103)***	4.9515 (0.25112)***	4.6391 (0.24290)***	3.2949 (0.22219)***
Year FE	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Individual Covariates	No	No	No	Yes
N	1198641	1198641	1198641	1198641

Women				
	(5)	(6)	(7)	(8)
AttitudesxGay	-0.0205 (0.11812)	-0.0189 (0.11770)	-0.0138 (0.11733)	-0.0261 (0.10808)
Attitudes	-0.0423 (0.06827)	-0.0440 (0.06815)	-0.0420 (0.03239)	-0.0374 (0.03252)
Gay	0.2497 (0.19772)	0.2506 (0.19762)	0.2132 (0.20131)	-0.8829 (0.20609)***
Year FE	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Individual Covariates	No	No	No	Yes
N	1009510	1009510	1009510	1009510

Outcome variable is 0-100 score on Importance of Working with the Public.

Standard errors clustered at state level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 1.6: OLS Estimates By Parts of Distribution

e	Men			Women		
	All	Above Median	Below Median	All	Above Median	Below Median
AttitudesxGay	-0.0172 (0.14357)	0.3175 (0.10388)***	0.0099 (0.16491)	-0.0261 (0.10808)	0.0636 (0.10583)	0.1170 (0.11658)
Attitudes	-0.0166 (0.03283)	-0.0080 (0.02939)	-0.0257 (0.02542)	-0.0374 (0.03252)	0.0028 (0.01496)	-0.0002 (0.03629)
Gay	3.2949 (0.22219)***	-0.1515 (0.16297)	1.7151 (0.31136)***	-0.8829 (0.20609)***	-0.3064 (0.16737)	-0.1115 (0.22882)
N	1198641	521450	677191	1009510	594660	414850

Median occupation based on distribution of Importance of Working with the Public.

Outcome variable is 0-100 score on Importance of Working with the Public.

All estimates include individual level covariates, state FE, and year FE.

Standard errors clustered at state level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 1.7: Effect of Attitudes on State-Level Occupational Sorting

	Men			Women		
	(1)	(2)	(3)	(4)	(5)	(6)
Attitudes	0.0773 (0.0337)**	0.0769 (0.0341)**	0.1381 (0.0783)*	0.0355 (0.0263)	0.0344 (0.0265)	0.0756 (0.0438)
Year FE	No	Yes	Yes	No	Yes	Yes
State FE	No	No	Yes	No	No	Yes

Outcome variable is ratio of gay workers in service industry to heterosexual workers in service industry divided by ratio of gay workers in non-service industry to heterosexual workers in non-service industry

Standard errors clustered at state level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 1.8: Heterogenous Effects by Age

	Men			Women		
	All	30 or Less	Over 30	All	30 or Less	Over 30
AttitudesxGay	0.0055 (0.00331)*	0.0038 (0.00651)	0.0060 (0.00356)*	0.0032 (0.00315)	0.0045 (0.00740)	0.0025 (0.00320)
Attitudes	-0.0003 (0.00056)	-0.0019 (0.00197)	-0.0000 (0.00068)	-0.0005 (0.00074)	0.0007 (0.00205)	-0.0009 (0.00080)
Gay	0.0321 (0.00468)***	0.0653 (0.01046)***	0.0308 (0.00562)***	-0.0005 (0.00499)	-0.0473 (0.01096)***	0.0209 (0.00519)***
N	1198641	134570	1064071	1009510	143515	865995

Displayed estimate is average marginal effect on probability of working in an occupation with Importance of Working with the Public in the top quintile.

All estimates include individual level covariates, state FE, and year FE.

Standard errors clustered at state level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 1.9: Heterogeneous Effects by Race

	Men				Women			
	White	Black	Asian	Hispanic	White	Black	Asian	Hispanic
AttitudesxGay	0.0059 (0.00330)*	0.0125 (0.01194)	0.0011 (0.01545)	-0.0029 (0.00637)	0.0032 (0.00359)	0.0154 (0.01078)	-0.0142 (0.03227)	0.0002 (0.01172)
Attitudes	-0.0005 (0.00050)	-0.0003 (0.00234)	-0.0036 (0.00292)	0.0019 (0.00282)	-0.0003 (0.00081)	-0.0050 (0.00434)	-0.0027 (0.00493)	-0.0036 (0.00281)
Gay	0.0299 (0.00505)***	0.0076 (0.02522)	0.0038 (0.02315)	0.0379 (0.01332)***	-0.0081 (0.00576)	0.0320 (0.01749)*	0.0474 (0.04009)	-0.0144 (0.01647)
N	919671	74058	53776	83182	784081	64986	50540	59969

Displayed estimate is average marginal effect on probability of working in an occupation with Importance of Working with the Public in the top quintile.

All estimates include individual level covariates, state FE, and year FE.

Standard errors clustered at state level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



Table 1.10: Heterogeneous Effects by Ed Group

Men				
	No HS	HS Grad	Some Coll	Coll Grad
AttitudesxGay	-0.0099 (0.00517)*	0.0052 (0.00612)	0.0044 (0.00652)	0.0184 (0.00594)***
Attitudes	-0.0031 (0.00133)**	0.0008 (0.00082)	-0.0010 (0.00128)	0.0000 (0.00111)
Gay	0.0479 (0.01139)***	0.0845 (0.01001)***	0.0372 (0.00947)***	-0.0049 (0.00864)
N	92948	411458	267399	426836

Women				
	No HS	HS Grad	Some Coll	Coll Grad
AttitudesxGay	0.0083 (0.01639)	0.0062 (0.00463)	0.0090 (0.00720)	-0.0050 (0.00480)
Attitudes	0.0018 (0.00287)	-0.0009 (0.00133)	-0.0000 (0.00151)	-0.0007 (0.00109)
Gay	-0.0496 (0.02204)**	-0.0296 (0.00844)***	-0.0199 (0.01189)*	0.0370 (0.00772)***
N	46791	334099	260419	368201

Displayed estimate is average marginal effect on probability of working in an occupation with Importance of Working with the Public in the top quintile.

All estimates include individual level covariates, state FE, and year FE.

Standard errors clustered at state level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 1.11: Effect of Migration on Job Sorting (Men Only)

	All	Migrant	Non-Migrant
AttitudesxGay	0.0055 (0.00331)*	0.0062 (0.00411)	0.0057 (0.00432)
Attitudes	-0.0003 (0.00056)	-0.0008 (0.00090)	0.0002 (0.00059)
Gay	0.0321 (0.00468)***	0.0277 (0.00522)***	0.0375 (0.00759)***
N	1198641	587302	611339

Displayed estimate is average marginal effect on probability of working in an occupation with Importance of Working with the Public in the top quintile.

Migrant is defined as having residing in different state than birth state.

All estimates include individual level covariates, state FE, and year FE.

Standard errors clustered at state level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 1.12: Placebo Test: Using Other Tasks (Men Only)

Analyzing Data or Information			
	(1)	(2)	(3)
AttitudesxGay	0.0008 (0.00494)	-0.0001 (0.00427)	-0.0035 (0.00294)
Attitudes	0.0113 (0.00295)***	0.0008 (0.00057)	0.0008 (0.00051)
Gay	0.0909 (0.00907)***	0.0824 (0.00851)***	0.0633 (0.00434)***
Year FE	Yes	Yes	Yes
State FE	No	Yes	Yes
Individual Covariates	No	No	Yes
N	1156299	1156299	1156299

Frequency of Using Telephone			
	(4)	(5)	(6)
AttitudesxGay	0.0008 (0.00354)	0.0020 (0.00351)	0.0013 (0.00330)
Attitudes	0.0033 (0.00240)	0.0005 (0.00074)	0.0005 (0.00060)
Gay	0.1329 (0.00572)***	0.1273 (0.00601)***	0.1189 (0.00511)***
Year FE	Yes	Yes	Yes
State FE	No	Yes	Yes
Individual Covariates	No	No	Yes
N	1156299	1156299	1156299

Knowledge of Computers and Applications			
	(7)	(8)	(9)
AttitudesxGay	0.0001 (0.00363)	-0.0000 (0.00349)	-0.0015 (0.00310)
Attitudes	0.0066 (0.00235)***	0.0006 (0.00061)	0.0006 (0.00060)
Gay	0.0636 (0.00692)***	0.0580 (0.00666)***	0.0443 (0.00664)***
Year FE	Yes	Yes	Yes
State FE	No	Yes	Yes
Individual Covariates	No	No	Yes
N	1156299	1156299	1156299

Estimate is average marginal effect on probability of working in an occupation in the top quintile for each respective job task.

Standard errors clustered at state level.

\*\*\*p<0.001, \*\* p<0.01, \* p<0.05

Table 1.13: Using Importance of Working with a Group (Men Only)

	(1)	(2)	(3)
AttitudesxGay	0.0051 (0.00417)	0.0053 (0.00421)	0.0051 (0.00420)
Attitudes	0.0025 (0.00156)	-0.0003 (0.00061)	-0.0003 (0.00056)
Gay	0.0516 (0.00597)***	0.0468 (0.00605)***	0.0405 (0.00613)***
Year FE	Yes	Yes	Yes
State FE	No	Yes	Yes
Individual Covariates	No	No	Yes
N	1156299	1156299	1156299

Estimate is average marginal effect on probability of working in an occupation in the top quintile for each respective job task.

Standard errors clustered at state level.

\*\*\*p<0.001, \*\* p<0.01, \* p<0.05

Table 1.14: Placebo Test: Using Discriminatory Attitudes Towards Blacks (Men Only)

	(1)	(2)	(3)
RaceAttitudesxGay	0.0043 (0.00372)	0.0044 (0.00374)	0.0015 (0.00325)
RaceAttitudes	0.0018 (0.00334)	0.0005 (0.00092)	0.0003 (0.00087)
Gay	0.0580 (0.00419)***	0.0535 (0.00491)***	0.0386 (0.00408)***
Year FE	Yes	Yes	Yes
State FE	No	Yes	Yes
Individual Covariates	No	No	Yes
N	1156299	1156299	1156299

Displayed estimate is average marginal effect on probability of working in an occupation with Importance of Working with the Puplic in the top quintile.

Standard errors clustered at state level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Figure 1.1: Scatter Plot of Attitude Index and Sorting Ratio (Average 2006-2010)

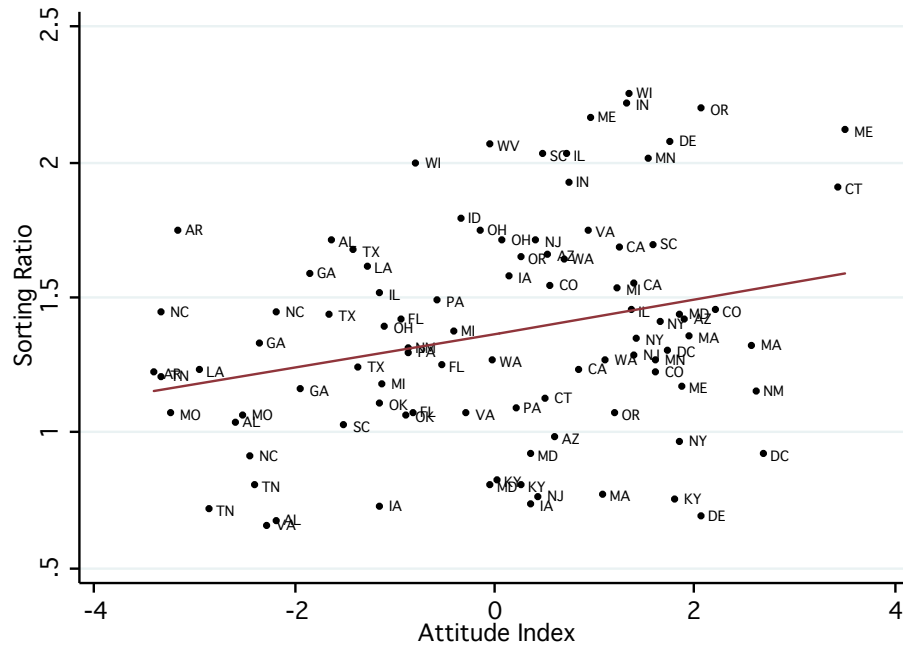


Figure 1.2: Map of Attitude Index and Sorting Ratio (Average 2006-2010)

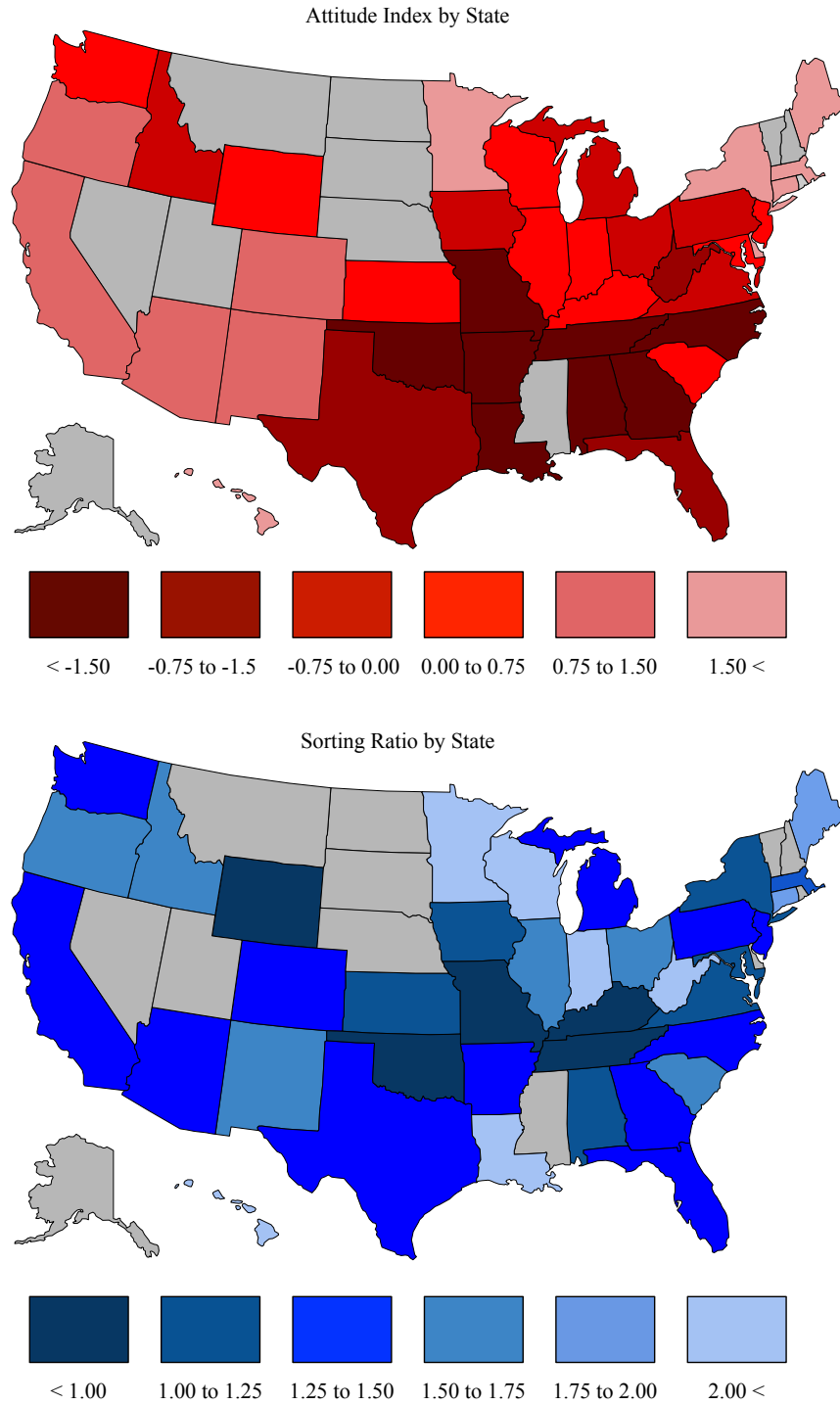


Figure 1.3: Probit Average Marginal Effects Using Alternative Cutoffs

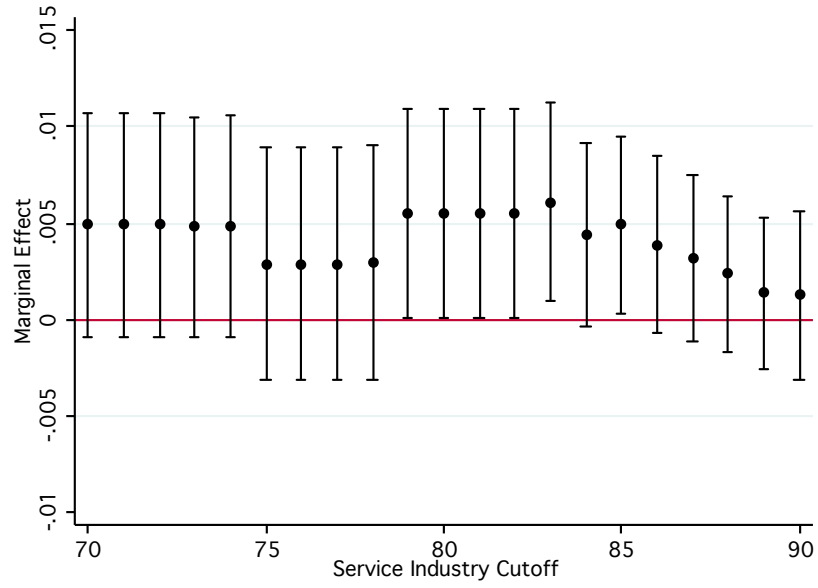


Figure 1.4: State-Level Estimated Coefficients Using Alternative Cutoffs

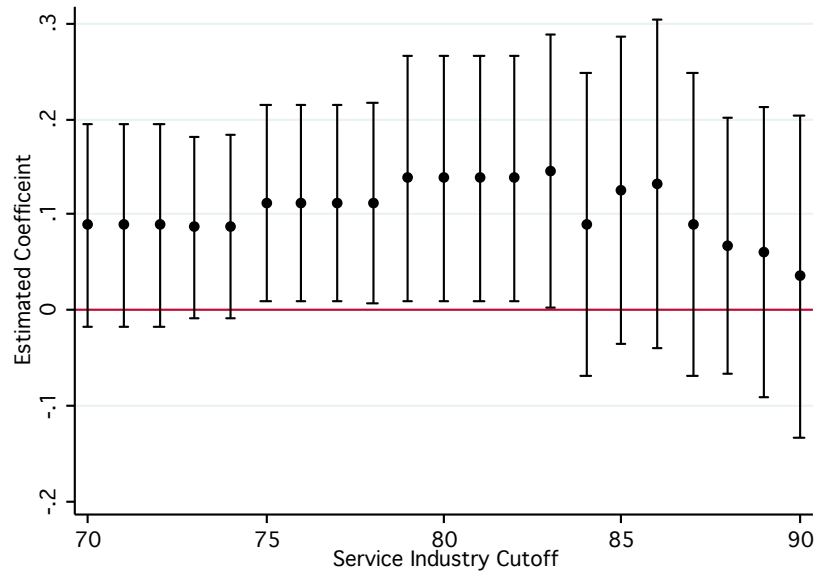


Table A1.2: Effect on Likelihood of Working in Service (Alternative Indeces)

Omit Same-sex Marriage Questions				
	(1)	(2)	(3)	(4)
AttitudesxGay	0.0092 (0.00335)***	0.0093 (0.00334)***	0.0087 (0.00356)**	0.0067 (0.00351)*
Attitudes	0.0021 (0.00167)	0.0017 (0.00180)	-0.0001 (0.00057)	-0.0001 (0.00057)
Gay	0.0486 (0.00445)***	0.0487 (0.00445)***	0.0459 (0.00475)***	0.0329 (0.00450)***
Year FE	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Individual Covariates	No	No	No	Yes
N	1198641	1198641	1198641	1198641

Using Additional Years				
	(5)	(6)	(7)	(8)
AttitudesxGay	0.0085 (0.00260)***	0.0085 (0.00260)***	0.0079 (0.00284)***	0.0063 (0.00295)**
Attitudes	0.0025 (0.00184)	0.0022 (0.00195)	-0.0001 (0.00047)	-0.0001 (0.00045)
Gay	0.0477 (0.00339)***	0.0478 (0.00339)***	0.0447 (0.00360)***	0.0309 (0.00345)***
Year FE	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Individual Covariates	No	No	No	Yes
N	1997028	1997028	1997028	1997028

Advancing Index One Year, Reverse Causlity				
	(5)	(6)	(7)	(8)
AttitudesxGay	0.0030 (0.00289)	0.0030 (0.00288)	0.0030 (0.00281)	0.0021 (0.00289)
Attitudes	0.0024 (0.00180)	0.0023 (0.00180)	-0.0003 (0.00078)	-0.0002 (0.00074)
Gay	0.0423 (0.00480)***	0.0424 (0.00480)***	0.0394 (0.00437)***	0.0260 (0.00466)***
Year FE	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Individual Covariates	No	No	No	Yes
N	1187864	1187864	1187864	1187864

Displayed estimate is average marginal effect on probability of working in an occupation with Importance of Working with the Public in the top quintile.

Standard errors clustered at state level

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table A1.3: Corrected Probit Estimates

Original Probit Estimates				
	(1)	(2)	(3)	(4)
AttitudesxGay	0.0078 (0.00328)**	0.0078 (0.00328)**	0.0074 (0.00344)**	0.0055 (0.00331)*
Attitudes	0.0024 (0.00183)	0.0023 (0.00183)	-0.0003 (0.00055)	-0.0003 (0.00056)
Gay	0.0473 (0.00480)***	0.0474 (0.00480)***	0.0449 (0.00498)***	0.0321 (0.00468)***
Year FE	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Individual Covariates	No	No	No	Yes
N	1198641	1198641	1198641	1198641

Corrected Probit Estimates				
	(1)	(2)	(3)	(4)
AttitudesxGay	0.0094 (.00162)***	0.0094 (.00163)***	0.0085 (0.00163)***	0.0062 (0.00160)***
Attitudes	0.0024 (.00046)***	0.0023 (.00044)***	-0.0003 (0.00033)	-0.0003 (0.00034)
Gay	0.0473 (.00059)***	0.0474 (.00053)***	0.0449 (0.00053)***	0.0321 (0.00425)***
Year FE	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Individual Covariates	No	No	No	Yes
N	1198641	1198641	1198641	1198641

Displayed estimate is average marginal effect on probability of working in an occupation with Importance of Working with the Public in the top quintile.

Bootstrapped standard errors in parenthesis.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



## CHAPTER 2 - The Profit Penalty for Discrimination on the Basis of Sexual Orientation

### **I. Introduction**

The genesis of economic analysis of labor market discrimination is Gary Becker's *The Economics of Discrimination* (1957). In his book, Becker describes employer discrimination as any case where a firm lacks objectivity in hiring practices. Here, objectivity refers to hiring individuals on the sole basis of productivity; any deviation from this standard would be defined as discriminating behavior. Labor economists have used Becker's model and extensions for nearly sixty years to describe the causes and effects of labor market discrimination. Over the last few decades, these models have been applied to the case of gay and lesbian workers to understand their role in the labor market, and how they are affected by labor market discrimination.

Amongst several implications to emerge from the taste-based discrimination model is a profit penalty for firms that choose to discriminate. Existing literature has confirmed many other implications of the Becker model, but has not fully investigated this profit penalty as it pertains to sexual orientation. This paper examines the existence and magnitude of the profit penalty for firms that discriminate against employees on the basis of sexual orientation. This paper improves upon existing estimated effects by introducing firm fixed effects to exploit changes in discriminatory policies during this time period. Furthermore this paper uniquely introduces discrete levels of discrimination as explanatory variables, which both contextualizes the results within the Becker model

predictions and appears to be the most appropriate approach given the construction of the available data on discrimination.

To identify discriminating firms, I use the Human Right's Campaigns Corporate Equality Index. Designed to signal consumers and potential employees of firms employing discriminatory practices against LGBT workers, I use this to proxy for the level of discrimination at a firm level. Data on profit rates is then matched with the Corporate Equality Index to examine the relationship between the two. During the years included in the study, increased awareness and public pressure have caused many firms to adjust corporate hiring practices. As a result, I can use firm-level fixed effects to identify the profitability implications of firms abandoning discriminatory practices.

I find that firms moving from high levels of discrimination to low levels improve their profit rate by approximately 19% of one standard deviation. I do not, however, find evidence that firms that already display low levels of discrimination improve their profit rate by furthering non-discrimination policies.

## **II. Becker Model of Discrimination**

Suppose there exist two types of workers, type A and type B. Workers are identical with the exception of one distinguishable characteristic (e.g., race, gender, sexual orientation). Since workers are otherwise identical, they are equally productive. Type A workers are from the majority class, and are not subject to discrimination. Type B workers are the

minority and subject to discrimination from a subset of employers. Let  $d$  be the “coefficient of discrimination”, the firm-specific level of distaste for hiring minorities. Firms maximize the following utility function where,  $p$  is the price level,  $F$  is the firm’s production function,  $N_j$  is the number of workers of type  $j$ , and  $w_j$  is the market wage paid to individuals of type  $j$ .

$$U = pF(N_A + N_B) - w_A N_A - w_B N_B - d N_B$$

Since workers are identical apart from their group, they are perfect substitutes in production. Employers with  $d = 0$  are non-discriminating and consider only the market wages when determining who to hire. Employers who are prejudiced,  $d > 0$ , take into account both wages and distaste for hiring minorities, considering the entire cost to their utility,  $d + w_B$ , when evaluating members of group B. Therefore, firms only hire group B workers if  $w_A - w_B \geq d$ .

Each firm hires workers to satisfy the following equations:

$$pF'(N_A) = w_A$$

$$pF'(N_B) = w_B + d$$

Aggregating across firms in the economy, and treating the price parameter as constant yields the demand functions  $N_A^D(w_A, w_B, G(d))$  and  $N_B^D(w_A, w_B, G(d))$  where  $G(d)$  is the

CDF of the discrimination coefficient in the population of employers. Wages are thereby calibrated to satisfy the following equations:

$$N_A^D(w_A, w_B, G(d)) = N_A^S(w_A)$$

$$N_B^D(w_A, w_B, G(d)) = N_B^S(w_B)$$

Here the supply functions only consider the wage as the workers do not care about the discriminatory attitudes of the individual firms insofar as it doesn't affect his wages.

With this model in mind, if discrimination against type B exists in the market, a wage gap would emerge between individuals of different types. Employers whose distaste for minorities is larger than the wage gap would choose not to employ any type B individuals. Employers with distaste lower than the wage gap would save costs and hire the type B workers. As a result, minorities in the labor force line up at non- or low-discrimination firms. These firms would hire type B workers at a lower cost than type A workers until their firms were full. The type B laborers would then gradually shift the queue to more discriminating firms until every worker has found a job. The discriminating coefficient at the last firm to hire a minority, referred to by Becker as the “marginal discrimination coefficient”, determines the magnitude of the partial equilibrium wage gap. Notice this wage gap only exists if there exist enough discriminating firms such that if  $w_A = w_B$  the supply of type B workers would exceed the demand.

The impact of a wage gap for firms is fairly straightforward. If two sets of workers are perfect substitutes, and one commands higher wages than the other, a firm hiring low-wage workers will be more profitable. Discriminating firms are then trading profits for the absence of the minority workers.

Though this model simplifies modern day discrimination in the labor force, (i.e. a single owner firm whose owner foregoes personal profit in order to keep minorities out of his factory) it provides testable implications of discrimination, many of which have been confirmed in the economic literature. Specifically, three principal implications are outlined as follows:

If taste-based discrimination in the labor market occurs:

- 1) A wage gap between the two types of workers would emerge.
- 2) The discriminated class of workers would sort themselves into less discriminating firms.
- 3) Discriminating firms would be less profitable than those utilizing objective hiring practices.

### **III. Evidence of Sexual Orientation Discrimination**

Discrimination against individuals on the basis of sexual orientation is difficult to observe as a researcher or even to enact as a discriminator. Unlike race or gender, homosexuality is

often difficult to observe, so the true impact of discriminating attitudes is likely small relative to the prevalence of discrimination.

Resume audit studies have been used extensively over the last 40+ years in order to see if discrimination in hiring practices exists. These studies are “controlled experiments, using matched pairs of fake transactors, to test for discrimination in the marketplace,” (Riach and Rich, 2002). While race and gender preferences are the target of most of these studies, resume audits regarding sexual-orientation preferences have also begun to emerge in the literature. Tilcsik (2011) found that applicants with a signal implying he was a gay male received approximate .62 callbacks for every one callback received by an identical applicant without the signal. This disparity grew in states with a legal environment less protective against discrimination. Weichselbaumer (2003) found fictitious lesbian applicants in Sweden received less interview invitations than similar straight females. These resume audits serve purely as evidence that there do exist some employers who discriminate against gay and lesbian workers to the extent that they are less likely to offer them jobs.

Though testing the presence of a sexual orientation wage gap presents some challenges, as gay and lesbian individuals are difficult to identify in most large data sets, a robust literature attempts to test its existence empirically. Beginning with Badgett (1995),

several papers<sup>1</sup> have emerged quantifying and explaining the sexual orientation wage gap. Klawitter (2015) offers a meta-analysis summarizing 34 studies and finds an average wage penalty of 11% for gay men. Though the existence of this wage gap for gay men is fairly conclusive, Klawitter (2015) finds an average wage premium for lesbians of 9% across 29 studies.

To test the second implication of the Becker model, that gay workers will sort into non-discriminating firms, data regarding the occupations of a set of gay workers is required. Plug, Webbink and Martin (2011) find evidence of this phenomenon using Australian industry level survey information. Levels of prejudice in certain occupations are ascertained using surveys of workers attitudes toward homosexuality. They find that jobs with a higher proportion of prejudiced workers have a lower proportion of gay workers.

As for the third implication, several studies test the profit penalty of the Becker model as it pertains to discrimination based on race and gender [Hellerstein, Neumark and Troske (2002), Kawaguchi (2006), Szymanski (2000)]. In the management literature, a few studies have emerged illustrating the relationship between gay-friendly policies, such as same-sex partner benefits, and corporate performance and stock prices [Pichler, et al. (2015), Li and Nagar (2013), Johnston and Malina (2008), Wang and Schwarz (2010)]. Each of these papers, however, only go as far as using state and industry fixed effects in their models. This suggests that any unobservable characteristics correlated with

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<sup>1</sup> Notably Clain and Leppel (2001), Allegreto and Arthur (2001), Berg and Lien (2002), Antecol, Jong, and Steinberger (2007)

profitability and corporate anti-discrimination policies could be biasing the results. This paper improves upon the findings of these studies by implementing firm-level fixed effects to account for within firm variation in discriminatory behavior. Additionally, this paper addresses the Becker model's implication that the profit penalty should exist around the marginal discriminating coefficient by splitting firms by different levels of discrimination.

#### **IV. Data**

The requisite data sets for determining the profit effects of employer discrimination are information identifying workplace discrimination and data identifying firm profits. Signals of discrimination are taken from the Human Rights Campaign's Corporate Equality Index. Profit data is taken from Compustat.

##### *Compustat*

Capital IQ Compustat is a "leading provider in financial market intelligence."<sup>2</sup> The Compustat data set is commonly used for academic research in finance, accounting, and economics.

Compustat data is presented in quarterly intervals. I chose to use second quarter data as it is substantially far from September when the new indices are reported, therefore any profit impact from a change in corporate policy should be observed in the second quarter

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<sup>2</sup> <http://www.compustat.com/OurCompany.aspx>



data. In total Compustat data items, net income, revenue, stock price, capital intensity, and firm size (number of employees) were collected for each year and firm covered in this study.

### *The Corporate Equality Index*

The Human Rights Campaign (HRC) is the largest LGBT (Lesbian, Gay, Bisexual and Transgender) advocacy group in the United States. According to the HRC's mission statement their aim is to "improve the lives of LGBT Americans by advocating for equal rights and benefits in the workplace."<sup>3</sup> Toward this objective, the HRC publishes an annual report measuring sexual orientation equality in the workplace. The Corporate Equality Index (CEI), is a comprehensive rating system that issues a score from 0 – 100 to firms based on their perceived levels of equality.<sup>4</sup>

The CEI pulls information from a variety of sources to rate companies based on the existence of non-discrimination policies, same-sex partner benefits, specific anti-LGBT infractions and more. A full explanation of the CEI methodology is included as Appendix 2.1.

Discrimination is inherently difficult to measure, and the Corporate Equality Index does not directly provide a measure of discriminatory hiring practices. The data compiled by

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<sup>3</sup> <http://www.hrc.org/the-hrc-story/mission-statement>

<sup>4</sup> A score of zero implies a firm employs none of the HRC's identified anti-discrimination policies. A score of 100 implies a firm employs all such policies.

the HRC, instead, allows me to be able to identify distaste for workers based on sexual orientation by the signal firms' corporate policies are sending to members of the LGBT community. My assumption then is that this signal either attracts or repels gay workers leading to comparable results as direct taste-based discrimination.

Though the Corporate Index has been published annually in September since 2002, there have been two incidents of change in the criteria for ranking companies. The first change was reflected in the CEI beginning in 2006, and the second change was seen in the 2012 version. In order to employ a consistent measure of discrimination, only the indices published between 2006 and 2011 are used. Additionally, the index published in September 2006 was referred to as the 2006 CEI (as was the case with all prior CEI reports). In 2007, the HRC decided it was more appropriate to refer to the index published in 2007 as the 2008 CEI; as a result, though an index was published every year, there is no 2007 CEI. Hence, the 2006 CEI is matched with 2007 Compustat data while the 2008 CEI is matched with 2008 Compustat data.

The number of firms rated by the HRC increases during each year of the study. In total, 1175 observations were recorded from 296 unique firms.

## **V. Trends in Corporate Equality**

Though the timeframe of this study is a mere five years, these were five years that saw a great change in corporate treatment toward gay workers. With same-sex marriage rights

as a frequent topic of political debate and the emergence of groups such as the HRC, sexual orientation issues have been pushed in to the spotlight. As evident by the improvement in CEI scores over time, this has caused an increase in the equal treatment of gay individuals in the workplace. Figure 1 shows kernel density estimates of the distribution of the Corporate Equality Index during the years 2007, 2009 and 2011. Figure 2.1 illustrates a shift of firms from lower CEI scores to high, suggesting firms are exhibiting less discriminatory behavior over this time period.

This trend is reaffirmed in Figure 2.2, which shows the concentration of firms for each year of the study. Here, firms are classified as high-discriminating, low-discriminating, or non-discriminating based on their CEI score. Firms given a score of 70 or below are considered to be high-discriminating firms, between 70 and 100 are low-discriminating, and scores of 100 are non-discriminating. A casual observation of the data revealed that approximately one third of firms rated by the HRC in 2007 received a perfect CEI score of 100. The cutoff of low and high discriminating firms was assigned such that, of the firms with less than perfect CEI scores (firms exhibiting some sort of discriminating signal), half would be considered low discriminating, and the other half would be considered high discriminating.

Table 2.2 shows the motion of the CEI scores for the 170 firms observed in 2007. Table 2.2 illustrates the nearly monotonic shift of the discrimination signal. While 54 firms

(32%) improved their signal from 2007 to 2011, only 13 firms (8%) got worse during the timeframe.

Table 2.3 provides suggestive evidence that discriminatory corporate policies stem from a place of individual distaste for homosexuality. Here I display the average 2007 CEI score for firms by the region of corporate headquarters alongside the percentage of 2006 General Social Survey respondents who answered homosexuality is “Always Wrong” within that region. This table illustrates, that for the most part, more discriminatory regions of the United States host corporations with more discriminatory policies.

Before going to the lengths to establish a causal relationship between two variables, it is useful to examine if any correlation exists. Figure 2.3 plots each observation by score on the Corporate Equality Index and profit rate. Both high and low outliers were dropped from this graph in order to eliminate the skewing effect. There does appear to be a positive relationship between CEI score and profit rate, however, further investigation is necessary to suggest a causal relationship.

## **VI. Estimation Strategy**

To estimate the impact of discriminatory attitudes towards gay workers on firm profit I will be using three equations on the dependent variable, a firm’s profit rate (profit/revenue). Profit rate is regularly used in the literature as a measure of a firm’s

profitability and is preferred over just using net profits, as that measure tends to be noisier.

$$(1) \textit{ProfitRate}_{it} = \beta D_{it} + \gamma X_{it} + \delta \textit{Year}_t + \epsilon_{it}$$

$$(2) \textit{ProfitRate}_{it} = \beta D_{it} + \gamma X_{it} + \delta \textit{Year}_t + \phi \textit{State}_i + \phi \textit{Industry}_i + \epsilon_{it}$$

$$(3) \textit{ProfitRate}_{it} = \beta D_{it} + \gamma X_{it} + \delta \textit{Year}_t + \theta \textit{Firm}_i + \epsilon_{it}$$

Here, the subscript  $i$  indexes individual firms and  $t$  indexes years.  $D$  is the firm-year level of discrimination demonstrated by the score on the Corporate Equality Index.  $X_{it}$  is a vector of time variant firm attributes.<sup>5</sup> The first regression includes only year fixed effects. The second regression adds both state and industry fixed effects. The third regression replaces the state and industry variables with firm fixed effects. The inclusion of firm fixed effects allows the estimation to control for any time invariant attributes of the firm.

I will be using two different strategies to employ the corporate equality index. The first is to directly entering the index score into the regression equation. The problem with this is that it assumes a linear relationship between the score and the profit measures. In my second set of regressions I will use dummy variables to indicate whether a firm is high, low, or non-discriminating. The cutoffs described above are used in the main analysis, with additional cutoffs discussed in the results section ( $\text{CEI} \leq 70$  – High Discriminating;

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<sup>5</sup> Firm size (total assets), number of employees, and capital intensity.

CEI = 100 – Non-Discriminating). This method acknowledges the ordinal ranking of the CEI but does not impose cardinality, much less linearity.

## **VII. Results**

Table 2.4 displays the results for all three specifications using the CEI as the proxy for discrimination. Though the initial specification yields a positive statistically significant result, the estimated effect gets smaller and less precise as additional fixed effects are added to the model. When firm fixed effects are added in the third specification, the estimated coefficient becomes statistically indistinguishable from zero. These results suggest, while there may be a positive relationship between CEI and profit rate, the relationship doesn't persist when only considering within firm changes in discriminatory policies. As mentioned before, using the CEI as the right hand side variable imposes cardinality (what's more, linearity<sup>6</sup>) that the methodology behind the construction of the CEI suggests is inaccurate. As a result, I believe the forthcoming results, using CEI cutoffs as the dependent variables, are more appropriate for this analysis.

Table 2.5 displays the results using the aforementioned levels of discrimination as the variable of interest. The first specification suggests that high discriminating firms experience a profit penalty compared to low discriminating firms. The magnitude of the estimated penalty, as well as the level of precision, decreases as fixed effects are added to the model. Now, however, the estimated effect is statistically significant even when firm

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<sup>6</sup> Regressions including higher order CEI variables yields similar results.

fixed effects are included. The estimated effect, -0.0289, suggests a firm displaying high-discriminating policies does so at a detriment to their profit rate equivalent to 19% of one standard deviation. This effect, however, is not present when comparing low-discriminating firms to non-discriminating firms (comparing firms with high CEI scores to those with perfect CEI scores). This set of estimates implies improving already inclusive corporate policies have no effect on profit rate. These results are consistent with the Becker model that predicts that firms with a positive discrimination coefficient, ( $d > 0$ ), will not face a profit penalty as long as they discriminate less than the marginally discriminating firm.

Figure 2.4 shows the sensitivity of the fixed effect results to different cutoff points between low and high discriminating firms. This figure shows that the magnitude of the estimate is fairly robust with any cutoff chosen between 60 and 80. The statistical significance of these estimates persists when choosing cutoffs between 66 and 78 (excluding 68 and 76). This suggests that the identified effect is not unique to the chosen cutoff of 70, but rather somewhere within the aforementioned range exists the point where a profit penalty is imposed.

Table 2.6 splits the sample of firms by industry concentration.<sup>7</sup> The model of taste-based employer discrimination suggests that the profit penalty comes as a result of a segregated workplace. If workers have a preference for the industry in which they work, a minority

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<sup>7</sup> Here, industry concentration is determined from the percentage of sales obtained by the top-8 firms in a NAISC sector, according to the 2007 Census Factfinder website.

worker should have less trouble sorting into a low-discriminatory firm in a more competitive industry. This suggests that a profit penalty is more likely to be observed in competitive industries. Though none of the estimated coefficients reported in Table 6 are statistically significant, the point estimates of the impact of being a high-discriminating firm suggest the profit penalty may differ based on industry concentration. While the point estimate for the effect within the high-concentration industry<sup>8</sup> is very near zero, the estimates for the medium- and low- concentration industries are much higher in magnitude. With a limited number of firms changing their CEI each year, and firm fixed effects included in the regression, it is not surprising a split sample would yield noisy estimates.

If workers do have preferences for working in particular industries, as I suggested above, then perhaps a firm's overall discriminatory policies would not be the driving factor for a minority worker's choice of firm, but rather the level of discrimination relative to the industry. To see if relative discrimination is predictive of an observed profit penalty, I repeat the regressions with a firm's deviation from the industry mean CEI as the explanatory variable. The results for these regressions are reported as Table 2.9. The estimated effects follow a similar pattern as the effect using CEI score as the explanatory variable. Once again, statistically significant effects are detected in the first regression and these effects get smaller and less precise as fixed effects are added. Also, as it was

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<sup>8</sup> The sector with the median concentration, manufacturing, is considered medium-concentration. Sectors with higher a concentration ratio are high-concentration, and those with a lower concentration ratio are low-concentration.



with CEI score, the effect is not statistically different from zero with the inclusion of firm fixed effects. Though it is indeed possible that this deviation is more important than overall levels of discrimination, this methodology suffers from the same criticism as the CEI score method. Specifically, this method imposes an inappropriate cardinality to the CEI, and this could be responsible for the insignificant results.

Tables 2.8 - 2.10 address potential criticisms of the previous results. First, a reverse causality story could be considered where high profits signal a firm that they can change corporate policy, perhaps because they consider policy changes such as offering same-sex partner benefits to be costly. To test this potential reverse causality problem, I lag all of the Compustat data by one year, and estimate the effects exactly as done before. Table 2.8 displays the results of this estimation. Seventeen observations did not have matching Compustat data from the year before, leaving 1158 observations in this analysis. Here, though we see a negative point estimate for high-discriminating firms, these estimates are not statistically significant in any of the three specifications. First, it can be seen that there does exist a negative and statistically significant coefficient on the high-discriminating indicator when using the first specification. This comes as little surprise, as without firm fixed effects, this just retests the relationship between the cutoffs and profit rates.

Though several firms changed their corporate policies during this time period, enough keep them constant that we would expect the lagged regression to still pick up this effect. When adding firm fixed effects, the entire estimated effect disappears. This suggests that there is no relationship between changes in the discrimination levels, and profits from the

year before, or, high profits do not correlate with changed discrimination policies during the following year. This suggests that reverse causality is not influencing the previous results.

One of the Human Right's Campaigns objectives of the Corporate Equality Index is to inform the public of discriminating firms, with the hope that public pressure, perhaps in the form of not patronizing a discriminating firm, causes firms to change their policies. If this was effective, firms could see lower profit rates as result of diminished sales, not the input side effect the Becker model predicts. To test this, I regress firm's quarterly revenue on the cutoffs between discrimination levels and report the results in Table 2.7. This suggests that the previously estimated effect is not directly caused by diminished sales.

Additionally, though the firm fixed effects control for all time invariant firm attributes, it is possible that the results are driven by firm growth. It is possible that firms expanding, perhaps to states with sexual orientation non-discrimination laws, would be the most likely to improve their CEI rating. If these firms are more likely to be improving their profit rate simultaneously, this would bias my results. To check if growing firms are the most likely to improve their CEI score, I construct a table showing the number of firms that fall in to each possible combination of altering their CEI and number of employees.

Table 2.10 illustrates this relationship<sup>9</sup>. Though it seems it may be true that shrinking firms are more likely to lower their CEI score, there is no evidence that firms improving their CEI score are more likely to be growing. The correlation between the changes in employee number and CEI is also very near zero.

### **VIII. Disaggregating the CEI**

The evidence provided suggests that improving a firm's CEI score will improve their profitability. By disaggregating the CEI score into its components, we might be able to get a better idea of the ways different aspects of discriminatory behavior might affect profitability. For example, is the CEI simply a signaling device, or is it the tangible benefit of something like same-sex partner benefits that attracts workers to a firm at a lower cost?

First, the Corporate Equality Index is broken down into the 11 criteria that compose the index.<sup>10</sup> Each Category, as they are labeled by the HRC, is an indicator signifying whether a firm employs a certain non-discriminatory policy (such as same-sex partner health insurance, Category 3a). The exception is Category 6, which indicates whether a firm has engaged in large-scale official or public action that is perceived as discriminatory<sup>11</sup>; points are deducted from the CEI with any such action.

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<sup>9</sup> Since the 2006 CEI uses a different rating system than the 2007 CEI, only observations from 2008-2011 are reflected in this table.

<sup>10</sup> These are outlined in Appendix A of this paper.

<sup>11</sup> The HRC describes potential offenses such as financial relationships with anti-LGBT advocacy organizations, legal proceedings that go beyond a reasonable defense, and opposing shareholder resolutions to advance LGBT equality. The HRC points to Exxon-Mobil, Wal-Mart, and Verizon's blocking of

Fixed effect regressions on profit rates are performed using all of components together, then each individually with the results of these regressions reported in Table 2.11. First, no statistically significant effect is detected in any of the regressions. This suggests that no individual components of the Corporate Equality Index are responsible for driving the results discussed in this paper. Exploring the magnitudes and directions of the estimated coefficients, however, tells an interesting story about different non-discrimination policies, though the confidence in these conclusions should be tempered by the noise of the estimates.

Though, once again, not statistically significant, the component with the highest magnitude comes from Category 6, the aforementioned discriminatory action. Of all the criteria, this best fits the narrative of a discriminating firm that, beyond merely not employing inclusive policies, partakes in specific, notable behaviors that undermine LGBT equality. Each sub category of Category 2 displays a negative, and very small point estimate. These criteria are unique in that they indicate policies specifically addressing gender identity and expression, rather than sexual orientation. The estimates on these effects having the opposite as expected sign could be an indication that though gender identity and expression policies are included in the CEI, they are less likely to influence a profit penalty.

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shareholder resolutions for inclusive non-discrimination policies (<http://www.hrc.org/resources/the-cei-criteria-explained>).

## **IX. Principal Component Analysis**

Using the disaggregated CEI discussed in the leading section, I perform principal component analysis to further the understanding of the relationship between profitability and discriminatory corporate policies. While each of the criterion that compose the Corporate Equality Index indicate different corporate policies, it should come as little surprise that many of the variables are highly correlated with one another. By performing principal component analysis with these categories, we are left with a set of orthogonal variables containing much of the information in the CEI categories that aren't exposed to the weights imposed by the HRC in the construction of the CEI.

As is standard procedure when performing PCA, I retained each component with an eigenvalue greater than one, leaving me with three principal components. The loadings of each category into these principal components is displayed as Table 2.12. Observing the eigenvectors associated with Component 1, which contains the bulk of the information retained from the initial set of CEI categories<sup>12</sup>, we see that each category contributes positively into Component 1 with the exception of Component 6, the penalty for anti-LGBT behavior. This mirrors the construction of the CEI, which awards positive points for each policy, but negative points for behavior indicated by Component 6.

Table 2.13 displays results when regressing the three components on corporate profit rates. The results for Component 1 are similar to the CEI results reported in Table 4. In

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<sup>12</sup> Component 1 alone explains 35.32% of the variation in initial set of CEI categories. In total, the three retained principal components explain 58.95% of the variation.

both cases, we observe positive statistically significant estimates through the first two specifications that attenuate and lose precision with the inclusion of firm fixed effects. The conclusion I draw from the similarity of these two estimates is that the failure of the CEI regressions to produce significant results in the presence of firm fixed effects does not stem from the weights given to the categories from the HRC. Instead, as discussed earlier, the profit penalty is not distributed with varying intensity based on the magnitude of discriminatory policies. Rather, as evident by the results when using CEI cutoffs, and suggested by the Becker model, the profit penalty is imposed somewhere along the distribution of discrimination firms.

## **X. Conclusions**

This paper demonstrates that the prediction of the Becker model that discriminating firms face a financial penalty can be applied to discrimination on the basis of sexual orientation. I find evidence that a relationship exists between unequal treatment of LGBT individuals and profitability as measured by a firm's profit rates. While I detect an impact when using the Human Rights Campaigns Corporate Equality Index as the explanatory variable in naïve specifications, this effect disappears with the inclusion for firm fixed effects. However, consistent with the Becker model, if I instead consider the level of discrimination using predetermined cutoffs, the effect is robust to the inclusion of firm fixed effects. This impact suggests firms moving from high to low levels of discrimination should expect an increase in their profit rate by approximately 19% of one standard deviation. Firms moving from the low-discriminating group to the non-

discriminating group, however, see no further increase in profitability. This suggests that a subset of firms is foregoing financial gains in order to maintain a culture or discrimination and inequality as it pertains to LGBT individuals.

Economic theory tells us that firms foregoing profit for non-economic reasons will not survive in a competitive economy with the presence of constant returns to scale. Though the dynamics of this model are not addressed directly in this paper, I present evidence that over time firms are employing fewer and fewer discriminatory policies consistent with the idea that firms understand the potential profit penalty. Further evidence of this trend can be observed in the wage gap literature. Klawitter (2015), while summarizing the literature on the sexual orientation wage gap in a meta-analysis, observes, “estimates from studies of both men and women have converged toward zero over time”. Though she states this trend could potentially be influenced to changing datasets, study designs, or modeling choices, this could be evidence of decreasing discrimination against LGBT individuals around the country. This decrease is suggestive that observed effects from this literature in the past two decades are evidence of a partial equilibrium that is in the process of being competed away as awareness of this discrimination grows. Though this trend provides hope that a competitive marketplace may relieve individuals suffering from discrimination on the basis of sexual orientation, several states are aiding this process with the passing of work place non-discrimination laws that cover sexual orientation. Currently, however, only twenty-three states<sup>13</sup> and the District of Columbia

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<sup>13</sup> CA, CO, CT, DC, DE, HI, IL, IA, ME, MD, MA, MN, NV, NH, NJ, NM, NY, OR, RI, UT, VT, WA, WI

require such non-discrimination policies, which is likely partially responsible for informing the variance in policies displayed in the Corporate Equality Index.

One glaring inconsistency with this analysis is accounting for the lesbian wage premium. The wage penalty for gay men appears to be fairly conclusive, but there is also evidence that lesbian women receive a wage premium. A few explanations could address why the lesbian premium does not counteract the wage penalty felt by gay men when creating the profit penalty. First, lesbian couples could be less reliant on partner benefits than gay couples meaning the inclusive policies could have a stronger pull on gay men. Though, according to the 2010 American Community Survey, lesbian cohabitating couples are less likely to have only one working partner than their male counterparts, that difference is very small.<sup>14</sup> An alternative explanation is that lesbian and heterosexual women are less substitutable than their male counterparts. If lesbian women are more productive than heterosexual women, then any diminished profits from the lesbian wage premium could be countered by the increase in productivity. Finally, a third explanation could be that discrimination against gay men is simply more prevalent or more intense than toward lesbians. Herek (2000) finds surveyed heterosexual men display attitudes towards gay men that “are consistently more hostile” than their attitudes towards lesbians, but no differences in attitudes from heterosexual women. If this differential treatment extends to hiring we could observe gay men more concentrated in less discriminatory firms, while lesbians are distributed more evenly amongst all firms. In any case, this challenges

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<sup>14</sup> 28.0% of gay male couples have only one working partner, as opposed to 27.4% of lesbian couples.



invites future work to explore the potential differences between gay men and lesbians as it relates to work place discrimination.

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## **Appendix 2.1 – Corporate Equality Index Methodology**

The Corporate Equality Index is comprised of information obtained from six sources:

- HRC’s Corporate Equality Survey
- SEC filings to track connections between firms and anti-LGBT organizations
- IRS 990 filings for business foundations’ gifts to anti-LGBT advocacy groups
- Case law and news accounts for allegations of discrimination
- Reports from individuals or groups
- The HRC Workplace Project

Using these sources the HRC scores a company based on six categories of criteria. Points are awarded for each criterion out a maximum point value, with partial points possible.

The criteria and maximum points are as follows:

1. Non-discrimination policy, diversity training – sexual orientation
  - a. Equal Employment Opportunity policy includes sexual orientation (15 points)
  - b. Diversity training covers sexual orientation (5 points)
2. Non-discrimination policy, diversity training & benefits – gender identity or expression
  - a. Equal Employment Opportunity policy includes gender identity or expression (15 points)

- b. Gender identity diversity training offered OR supportive gender transition guidelines in place (5 points)
  - c. Insurance includes access for transitioning individuals for at least one of the following benefits: counseling, pharmacy benefits, medical visits to monitor effects of hormone therapy, necessary surgical procedures, or short term disability leave for procedures (5 points)
3. Partner benefits
- a. Domestic partner health insurance (15 points)
  - b. Domestic partner COBRA, dental, vision, legal dependent coverage (5 points)
  - c. Other domestic partner benefits (5 points)
4. LGBT employee resource group / diversity council (15 points)
5. Engages in appropriate and respectful advertising and marketing or sponsors LGBT community events or organizations (15 points)
6. Responsible citizenship (deduction of 15 points for a large-scale official or public anti-LGBT blemish on recent records)

Table 2.1: Summary Statistics per Year (2007-2011)

	2007	2008	2009	2010	2011	Average
<b>CEI</b>						
Mean	77.20	81.08	82.53	84.02	85.67	82.32
SD	24.64	23.24	22.19	21.81	20.63	22.57
Min	0	0	0	0	0	0
Max	100	100	100	100	100	100
<b>Profit Rate</b>						
Mean	.0952	.0631	.0593	.0879	.1014	.0809
SD	.0834	.2021	.1219	.1058	.1520	.1395
Min	-.2427	-1.333	-1.095	-.5677	-.4389	-1.333
Max	.3874	1.898	.4414	.6799	.1.906	1.906
<b>High - D</b>						
Count	64	61	70	66	52	313
Percentage	32.3	27.6	27.6	24.4	22.5	26.6
<b>Low - D</b>						
Count	66	66	72	80	65	349
Percentage	33.3	29.9	28.3	29.5	28.1	29.7
<b>Non - D</b>						
Count	68	94	112	125	114	513
Percentage	34.3	42.5	44.1	46.1	49.4	43.7

Table 2.2: Movements of High-, Low- and Non-Discriminating Firms

		2011 CEI		
		High D	Low D	Non-D
2007 CEI	High D	23	21	7
	Low D	10	23	26
	Non D	0	3	57

Table 2.3: Comparing Discriminatory Policy and Discriminatory Attitudes

Region	CEI 2007	AlwaysWrong
New England <i>ME, VT, NH, MA, CT, RI</i>	76.7	12.2 %
Pacific <i>WA, OR, CA, AK, HI</i>	89.7	29.8 %
W. N. Central <i>MN, IA, MO, ND, SD, NE, KS</i>	74.2	39.3 %
Mid. Atlantic <i>NY, NJ, PA</i>	82.9	41.5%
E. N. Central <i>WI, IL, IN, MI, OH</i>	73.3	43.1%
Mountain <i>MT, ID, WY, NV, UT, CO</i>	76.0	44.9%
S. Atlantic <i>DE, MD, WV, VA, NC, SC, GA, FL, DC</i>	73.2	53.3%
W. S. Central <i>AR, OK, LA, TX</i>	63.2	60.9%
E. S. Central <i>KY, TN, AL, MS</i>	55.0	64.1%

Table 2.4: Coefficients on Profit Rates Using CEI Score

	(1)	(2)	(3)
CEI	.0066*** (.0002)	.0004** (.0001)	.0002 (.0003)
State	No	Yes	No
Industry	No	Yes	No
Firm	No	No	Yes
N	1175	1175	1175

Standard errors clustered at firm level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 2.5: Coefficients on Profit Rates Using Cutoffs

	(1)	(2)	(3)
High - D	-.0349*** (.0108)	-.0287** (.0114)	-.0289* (.0163)
Non - D	.0064 (.0126)	.0041 (.0119)	-.0069 (.0136)
State	No	Yes	No
Industry	No	Yes	No
Firm	No	No	Yes
N	1175	1175	1175

Standard errors clustered at firm level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 2.6: Heterogenous Coefficients by Industry Concentration

	High Concentration	Medium Concentration	Low Concentration
High - D	-.0006 (.0194)	-.0384 (.0304)	-.0341 (.0294)
Non - D	-.0182 (.0182)	.0320 (.0262)	-.0037 (.0024)
State	No	Yes	No
Industry	No	Yes	No
Firm	No	No	Yes
N	315	455	395

Each regression contains firm fixed effects

Standard errors clustered at firm level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 2.7: Coefficients on Profit Rates Using Industry Deviation

	(1)	(2)	(3)
CEI	.0005** (.0002)	.0004** (.0002)	.0003 (.0003)
State	No	Yes	No
Industry	No	Yes	No
Firm	No	No	Yes
N	1175	1175	1175

Standard errors clustered at firm level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 2.8: Reverse Causality, Lagging Compustat Data One Year

	(1)	(2)	(3)
High - D	-.0200* (.0119)	-.0121 (.0135)	.0037 (.0173)
Non - D	.0240* (.0127)	.0186 (.0119)	-.0026 (.0154)
State	No	Yes	No
Industry	No	Yes	No
Firm	No	No	Yes
N	1158	1158	1158

Standard errors clustered at firm level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



Table 2.9: Coefficients on Revenue Using Cutoffs

	(1)	(2)	(3)
High - D	-1476.3 (1491.8)	-1854.2 (1628.7)	-47.9 (234.7)
Non - D	1454.4 (884.6)	1210.7 (833.9)	-46.3 (255.3)
State	No	Yes	No
Industry	No	Yes	No
Firm	No	No	Yes
N	1175	1175	1175

Standard errors clustered at firm level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 2.10: Relationship Between Firm Growth and CEI Changes

		CEI		
		Growing	No Change	Shrinking
Firm Size	Growing	86	309	28
	No Change	7	28	5
	Shrinking	89	312	39

Correlation = 0.0289

Table 2.11: Disaggregating the CEI: Coefficients on Profit Rate

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Category 1a	0.0133 (0.0202)	0.0161 (0.0195)										
Category 1b	0.0324 (0.0229)		0.0210 (0.0181)									
Category 2a	-0.00809 (0.0141)			-0.00450 (0.0144)								
Category 2b	-0.00947 (0.0113)				-0.00569 (0.0120)							
Category 2c	-0.00632 (0.0149)					-0.00401 (0.0136)						
Category 3a	0.0230 (0.0240)						0.0236 (0.0210)					
Category 3b	-0.0115 (0.0207)							0.00297 (0.0136)				
Category 3c	0.0161 (0.0149)								0.0154 (0.0126)			
Category 4	-0.0166 (0.0158)									0.00168 (0.0125)		
Category 5	0.0185 (0.0188)										0.0153 (0.0163)	
Category 6	-0.0270 (0.0240)											-0.0292 (0.0218)
Observations	1,175	1,175	1,175	1,175	1,175	1,175	1,175	1,175	1,175	1,175	1,175	1,175

Standard errors clustered at firm level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 2.12: Principal Component Eigenvectors

CEI Category	Component 1	Component 2	Component 3
1a	0.1667	-0.0129	-0.662
1b	0.2095	0.4831	-0.014
2a	0.3246	0.1559	0.0872
2b	0.2918	0.3073	0.2512
2c	0.279	0.1584	-0.0172
3a	0.3344	-0.4777	0.1025
3b	0.3703	-0.3762	0.2073
3c	0.3934	-0.3014	0.1591
4	0.3462	0.2543	-0.1517
5	0.3565	0.195	-0.1283
6	-0.0966	0.2437	0.6102

Table 2.13: Principal Component Regression Coefficients

	(1)	(2)	(3)
Principal Component 1	.0076*** (.0023)	.0042* (.0022)	.0032 (.0031)
Principal Component 2	.0038 (.0033)	.0074* (.0039)	-.0025 (.0042)
Principal Component 3	-.0006 (.0029)	-.0040 (.0032)	-.0043 (.0036)
State	No	Yes	No
Industry	No	Yes	No
Firm	No	No	Yes
N	1175	1175	1175

Standard errors clustered at firm level.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Figure 2.1: Share of High-, Low-, and Non-Discriminating Firms 2007-2011

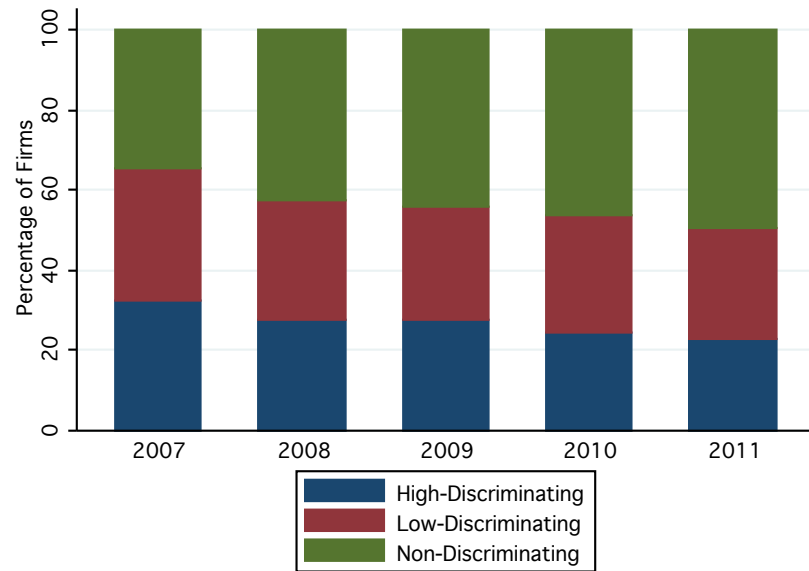


Figure 2.2: Corporate Equality Index Density 2007-2011

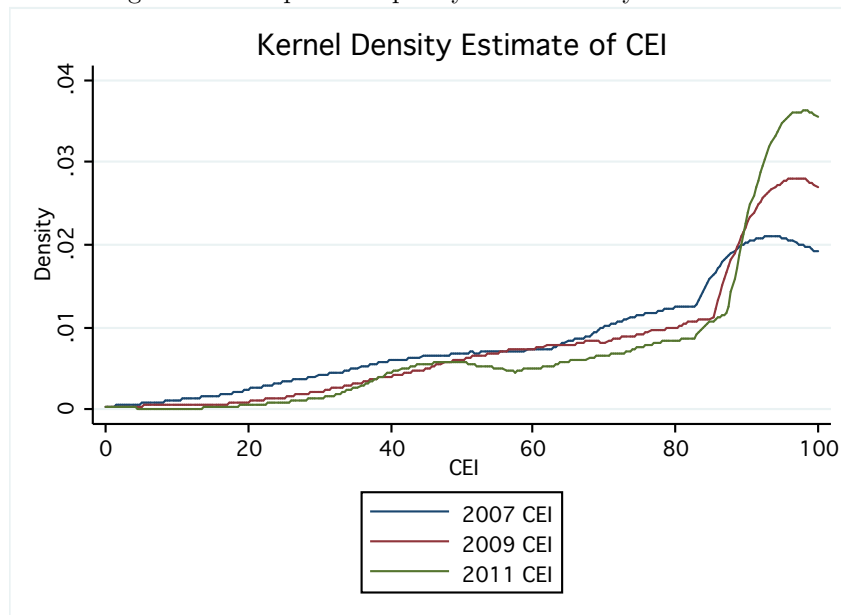


Figure 2.3: Scatter Plot of CEI and Profit Rate

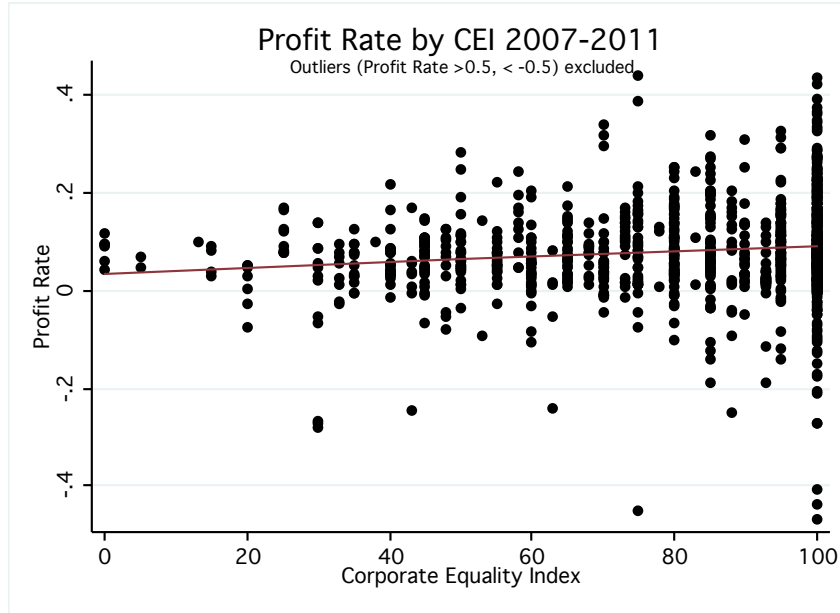


Figure 2.4: Profit Rate Estimates Using Alternative Cutoffs

