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Decomposition of Sexual Orientation Wage Gap in Massachusetts and Alabama from 2001 to 2015

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PLAGIARISM STATEMENT

I have written this project using in my own words and ideas, except otherwise indicated. I have subsequently attributed each word, idea, figure and table which is not my own to their respective authors. I am aware that paraphrasing is plagiarism unless the source is duly acknowledged. I understand that the incorporation of material from other works without acknowledgment will be treated as plagiarism. I have read and understand the Levy Economics Institute of Bard College statement on plagiarism and academic honesty as well as the relevant pages in the Student Handbook.

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Abstract

Sexual orientation wage gap has been an emerging topic in economic analysis. In United States, most of the research is focused on national level. However, given the deeply divided political ideologies on Lesbian, Gay, Bisexual and Transgender (LGBT) rights issues such as same-sex marriage legislation among different states, one might wonder whether the wage gap would be also different. In this paper, we take the first step to present a systematical comparison of the sexual orientation wage gap from the past 15 years between Massachusetts and Alabama, who are opposite sides on almost every issue regarding LGBT rights. We employed Ordinary Least Squared regression and Oaxaca decomposition to analyze the wage gap and found that there is a smaller sexual orientation wage gap in Massachusetts than in Alabama, and the wage is also closing faster in Massachusetts.

JEL code: J31; J71

Keywords: sexual orientation wage gap, wage gap decomposition .

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I. INTRODUCTION

Ever since Lee Badgett's seminal paper[1] on sexual orientation wage gap (i.e. wage gap related to the wage earner's sexual orientation), there has been growing attention around this topic in economics. Past literature suggests that gay men in general suffer a wage penalty in the labor market and that lesbians enjoy a wage premium. Since there are very few surveys that include one's sexual orientation, the number of observations identified as sexual minorities is far fewer than reality. To begin with, in most surveys' gender column, there are only two choices: male or female. This essentially excludes those who are transgender, and those who are questioning. Common ways to identify Lesbian, Gay and Bisexual (LGB) people in surveys are through their sexual behavior or by singling out same-sex couples as those who are in committed relationships. Therefore, most empirical works on the sexual orientation wage gap in United States are done on the national level with imprecise data, and using assumptions that may not hold true in reality.

Studies on pay gap based on other characteristics that are subject to discrimination in the workplace, such as race and gender, suggest that the gap varies a lot at the state level. For example, in New York and Delaware, the ratio of female average earnings to male average earnings is 0.89, whereas in Louisiana and Wyoming, the ratio is 0.68 and 0.64 respectively[2]. To what extent the sexual orientation wage gap varies across States remains unknown.

In addition, Klawitter[3] showed a converging trend of the sexual orientation wage gap over time on national level. Studies on data in 1990s generally found a 10% to 30% wage penalty for gay men and a 15% to 35% wage premium for lesbians, i.e. gay women. The most recent studies show that the gay wage penalty became 0% to 20% and lesbian wage premium became 20% to 5%.

How the trend varies at state level is another matter. One might be able to relate the variations in the trend in different states to the differences in the treatments of LGBT rights such

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[1] M. V. L. Badgett, The Wage Effects of Sexual Orientation Discrimination, *ILR Review* 48, no. 4 (1995)

[2] Wage Gap State Rankings: 2015, 2016, https://nwlc.org/wp-content/uploads/2015/09/Wage-Gap-State-By-State.pdf.

[3] Marieka Klawitter, Meta-Analysis of the Effects of Sexual Orientation on Earnings, *Industrial Relations: A Journal of Economy and Society* 54, no. 1 (2014), doi:10.1111/irel.12075.

as anti-discrimination laws and same-sex marriage legalization in state laws. For example, in Louisiana, the governor signed an executive order in 1992 that bans discrimination on sexual orientation in the public sector, but this order was allowed to lapse in 1996. The order was reinstated in 2004 and expired again in 2008[4]. Issues like same sex marriage faced greater resistance than anti-discrimination laws. For example, California[5] first passed Proposition 22 in 2000. The voter-approved proposition defined marriage as between a man and woman only. The State Senate passed Assembly Bill 849 in 2005 to recognize same-sex marriage but the governor vetoed it. On the other hand, Vermont allowed same sex couples to form civil unions in 2000, and Massachusetts became the first state to allow same sex marriage in 2004. It is evident that the progress of LGBT rights among different states takes on different paths. Since state LGBT rights could affect the sexual orientation wage gap[6], the trend of the wage gap could be different across states as well.

In this paper, we attempt to investigate these two questions by comparing the sexual orientation wage gaps and their trends on state level in the United States. Since this is the first attempt to systematically compare the sexual orientation wage gap on state level, we choose two states that have a significantly different stance on LGBT issues. We choose Massachusetts and Alabama, based on their almost entirely different progress on anti-discrimination laws and same-sex marriage legalization. Massachusetts is one of the earliest states that included sexual orientation provision in the state anti-discrimination law and the first state that passed same-sex marriage legislation. Alabama, on the other hand, still does not have such a provision in its anti-discrimination law today, and its state supreme court refused to accept Obergefell v. Hodges, which recognizes marriage as a fundamental right for same-sex couples.

In the next section, we review past literature, especially empirical works on sexual orientation wage gap with a focus on their data, methodology and findings. In the third section,

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[4] David Christafore and Sebastian Leguizamon, Earnings Differences between Homosexuals and Heterosexuals and the Effects of Anti-discriminatory Laws: Equal but Still Unmarried, *MPRA Paper 45267*, November 2012.

[5] Southern California Public Radio project, Timeline: Same Sex Marriage in California. http://projects.scpr.org/timelines/prop-8/.

[6] Christafore and Leguizamon, Earnings Differences between Homosexuals and Heterosexuals and the Effects of Anti-discriminatory Laws: Equal but Still Unmarried.

we present our own data and methodology. We use the American Community Survey (ACS)[7] as our main data source, and we conduct the Oaxaca decomposition on the sexual orientation wage gap between LGBT people and their heterosexual counterparts. Fourth section consists of two parts. First it presents exploratory data analysis of the observations that are identified as gay/lesbian in both states. Then we show the findings of OLS regression and Oaxaca decomposition. Fifth section offers concluding remarks.

II. LITERATURE REVIEW

In this section, we will first review literature on theoretical framework explaining wage gap in general, as well as methodologies used in empirical works. Next, we will cover existing work on the sexual orientation wage gap in particular. Topics include the definition of sexual orientation, identification of LGBT people, available survey data, methodologies in examining the sexual orientation wage gap, and interpretation of the wage gap based on the above theories.

Research on wage gap mostly focuses on race/ethnicity, and gender. Theoretical frameworks attribute the existence of the wage gap to the characteristics of the disadvantaged group, the unfavorable treatments in the labor market, or both. For example, theories focusing on the characteristics include the household production theory[8].In Becker's theory, within a household, women are in charge of household production and therefore lack the opportunity to accumulate human capital such as education that would benefit them in the work place. Men, on the other hand do not spend time on household production and have the opportunity to accumulate more human capital. The disparity of human capital between men and women results in the gender wage gap.

Unfavorable treatments of the disadvantaged group usually imply work place discrimination. One of the earliest theories[9] is who attempts to explain discrimination as a function of taste or preferences, focusing on the prejudice of employers or coworkers against members of a certain social group. Employers, employees, and customers can all have such tastes. Essentially, associating with the discriminated social group would come with a cost, resulting in the wage

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[7] Steven Ruggles et al., Integrated Public Use Microdata Series: Version 6.0 [Machine-readable Database], 2015.

[8] Gary S. Becker, *A Treatise on the Family* (Cambridge, MA: Harvard University Press, 1981).

[9] Gary S. Becker, *The Economics of Discrimination* (Chicago: University of Chicago Press, 1995).

gap. Statistical discrimination is built on theories of asymmetric information[10]. Employers do not know the actual productivity of the applicants. They would have to use easily acquired knowledge of the applicants' characteristics such as gender or race to discriminate if these characteristics are associated with productivity. If women in general are known to employers as less productive than men, employers do not know whether their specific female employees are less productive or not. In order to avoid overpaying less productive employees, the employers would have to pay all their female employees lower wages even if they are more or equally productive than men who are working with those employers.

Overcrowding theory is based on the taste theory[11]. It aims to explain occupational segregation rather than wage discrimination. It assumes that for example, women and men have equal productivity and there are two types of occupations. If one type of occupation is not open to women while men can work with both occupations, there will be excess supply of labor in the type of occupation that both men and women can work in. It will result in lower wage of this type of occupation and hence lower wage for women. Segmented labor market theory more focuses on occupational segregation between the two job types rather than wage differentials for the same work. It assumes that there are primary and secondary jobs in the labor market and the primary jobs have higher wages than the secondary ones. The disadvantaged group is more likely to end up in the secondary jobs resulting in the wage gap.

There have been many methodologies developed to examine the wage gap. Here, we will briefly review some major ones. They can be separated into two categories: estimating the wage gap at the mean, and beyond the mean. To examine the wage gap at mean, Ordinary Least Squares (OLS) regression is the one most commonly used[12]. The estimated coefficients of a dummy variable indicating the disadvantaged group represent the wage differential on average.

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[10] Dennis J. Aigner, Statistical Theories of Discrimination in Labor Markets, *Industrial and Labor Relations Review* 30, no. 2 (January 01, 1977).

[11] Barbara R. Bergmann, Occupational Segregation, Wages and Profits When Employers Discriminate by Race or Sex, *Eastern Economic Journal* 1, no. 2 (April 01, 1974), accessed April 25, 2017.

[12] Deborah Anderson, Racial Differences in Access to High-Paying Jobs and the Wage Gap between Black and White Women, *Industrial and Labor Relations Review* 49, no. 2 (January 01, 1996); Badgett, The Wage Effects of Sexual Orientation Discrimination.

Oaxaca decomposition[13] is another major methodology to estimate the wage differential at mean. It specifies how much of the wage gap is attributed to the differences in characteristics between the disadvantaged group and the advantaged group, and how much is due to differences in the returns to those characteristics. The latter is usually interpreted as due to discrimination.

With beyond the mean methodologies, it is assumed that the distribution of the wage between the two groups is not equal. Quantile regression is the most common measure to estimate the wage differentials at each quantile[14]. DiNardo-Fortin-Lemieux (DFL) decomposition[15] is another method working on distribution. It estimates counterfactual wage distributions and shows how the distribution changes with new characteristics or returns. Other popular measures include variance decomposition[16] and Juhn-Murphy-Pierce decomposition[17], which aim to identify the contributions of unobserved characteristics to the wage gap.

Next, we will review current literature on sexual orientation wage gap, starting from the definition of sexual orientation in empirical works.

In the United States, few surveys ask people to list their sexual orientation. The ones that do are typically health surveys that contain little information about economic characteristics. Moreover, they only provide the choice between male and female for gender identification. Therefore, when speaking of sexual orientation, all existing economic literature refers to lesbian, gay, and bisexual, and excludes transgender. Most commonly used surveys for studying the sexual orientation wage gap are the General Social Survey (GSS) and the Census survey. Badgett[18] first attempted to identify LGB from the GSS, which considers a person's same-sex partners and opposite-sex partners since age 18; the person is categorized as LGB if the number

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[13] Ronald Oaxaca, Male-Female Wage Differentials in Urban Labor Markets, *International Economic Review* 14, no. 3 (October 01, 1973).

[14] Abdallah Dah and Ali Fakih, Decomposing Gender Wage Differentials Using Quantile Regression: Evidence from the Lebanese Banking Sector, *International Advances in Economic Research* 22, no. 2 (2016).

[15] John Dinardo, Nicole M. Fortin, and Thomas Lemieux, Labor Market Institutions and the Distribution of Wages, 1973-1992: A Semiparametric Approach, *Econometrica* 64, no. 5 (1996).

[16] Richard B. Freeman, Unionism and the Dispersion of Wages, *ILR Review* 34, no. 1 (1980).

[17] Chinhui Juhn, Kevin M. Murphy, and Brooks Pierce, Wage Inequality and the Rise in Returns to Skill, *Journal of Political Economy* 101, no. 3 (1993).

[18] Badgett, The Wage Effects of Sexual Orientation Discrimination

of same-sex partners is greater than or equal to the number of opposite-sex partners. Later studies of the GSS data lowered the time range to the past five years[19].

However, as Badgett acknowledges[20], sexual behavior alone does not give the truest indication of a person's sexual orientation. First, as Black et al.[21] pointed out, some who are identified as LGB are in heterosexual marriages. Second, the latter definition leaves out people who are recently sexually inactive. In Cushing-Daniels and Yeung's study[22], sexually inactive people comprise 12% of the total observations. Third, the nature of each sexual relationship is not specified. People who had multiple short-term different-sex partners in the past but currently are in a long-term same-sex relationship would be classified as heterosexual by Badgett's definition, whereas people who got out of a long-term different-sex relationship and had a few brief same-sex encounters in the past one to five years would be classified as homosexual[23]. Furthermore, the behaviorally defined LGB group of people in the GSS are not representative. For example, Cushing-Daniels and Yeung[24] identified a total of 452 LGB people (209 women and 243 men) out of 15,425 observations. This 2.9% measure is significantly lower than the 5.7% estimate of self-identified LGB from the National Survey of Sexual Health and Behavior in 2009. It is also worth noting that according to the Centers for Disease Control's National Center for Health Statistics, 11% reported same-sex attraction and 8.8% reported same-sex behavior. Since the definition of sexual orientation is by sexual behavior in the GSS, the LGB percentage should be higher.

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[19] Dan A. Black et al., The Earnings Effects of Sexual Orientation, *Industrial and Labor Relations Review* 56, no. 3 (2003); Suzanne Heller Clain and Karen Leppel, An Investigation into Sexual Orientation Discrimination as an Explanation for Wage Differences, *Applied Economics* 33, no. 1 (2001); Brendan Cushing-Daniels and Tsz-Ying Yeung, Wage Penalties And Sexual Orientation: An Update Using The General Social Survey, *Contemporary Economic Policy* 27, no. 2 (2009).

[20] M.V. Lee Badgett, Discrimination Based on Sexual Orientation: A Review of the Literature in Economics and Beyond, *Handbook on the Economics of Discrimination*, 2006.

[21] Black et al., The Earnings Effects of Sexual Orientation.

[22] Cushing-Daniels and Yeung, Wage Penalties And Sexual Orientation: An Update Using The General Social Survey.

[23] Badgett, Discrimination Based on Sexual Orientation: A Review of the Literature in Economics and Beyond.

[24] Cushing-Daniels and Yeung, Wage Penalties And Sexual Orientation: An Update Using The General Social Survey.

Other studies turn to the 1990 and 2000 Census or ACS[25]. They identify sexual orientation by comparing each respondent's gender with that of their spouse or partner. Studies employing this approach usually only compare cohabitating LGB couples with cohabitating/married heterosexual couples.

To properly measure the effects of sexual orientation on the wage gap, we need to isolate it by controlling for other variables that could influences the wage. Variables in the model that examines the sexual orientation wage gap generally include sex, age, race, educational attainment, occupation, marital status, and region[26]. Some studies also include English proficiency, citizenship status, disability status, and number of children[27]. Most of the findings indicate positive coefficients for age, increasing level of education, white race, and being married. Occupations were categorized differently. Some used the Standard Occupation Classification system, which has 23 categories, while others used ACS occupational classification system, which has 7 categories. These two approaches mostly aim to categorize occupation from ACS data. For GSS data, Badgett[28] divided the occupations into 5 categories: professional/technical, managerial, clerical/sales, services, and craft/operative.

The most common approach in examining the sexual orientation wage gap is through OLS regression models. Sexual orientation is treated as a dummy variable, and its coefficient is considered as the wage gap. The existing literature has found that gay men suffer from 13% to 31% wage penalty in comparison to heterosexual men. In terms of lesbian wage differentials, the results are mixed. Badgett[29] finds that lesbian women earn 18% lower than heterosexual women,

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[25] H. Antecol, A. Jong, and M. Steinberger, The Sexual Orientation Wage Gap: The Role of Occupational Sorting and Human Capital, *ILR Review* 61, no. 4 (2008); Christafore and Leguizamon, Earnings Differences between Homosexuals and Heterosexuals and the Effects of Anti-discriminatory Laws: Equal but Still Unmarried; Suzanne Heller Clain and Karen Leppel, An Investigation into Sexual Orientation Discrimination as an Explanation for Wage Differences, *Applied Economics* 33, no. 1 (2001).

[26] Ibid.

[27] Antecol et al., The Sexual Orientation Wage Gap: The Role of Occupational Sorting and Human Capital; Marieka Klawitter, Multilevel Analysis of the Effects of Antidiscrimination Policies on Earnings by Sexual Orientation, *Journal of Policy Analysis and Management* 30, no. 2 (2011).

[28] Badgett, The Wage Effects of Sexual Orientation Discrimination.

[29] Ibid.

but the result is not statistically significant. Some[30] find that there are no statistically significant differences overall (3% to 6% higher). Others generally found that lesbians earn between 11% and 30% higher wages[31]. However, this approach only shows the existence of the wage gap. It does not allow for different returns to the characteristics between LGB and heterosexuals, therefore it cannot offer a deeper explanation for the wage gap based on those differences.

Very few studies use Oaxaca decomposition to address the contribution of the differences in returns to characteristics to the related wage gap. Some find that gay men and lesbians have better characteristics than their heterosexual counterparts, and while gay men receive unfavorable treatments, lesbians have higher returns[32]. Rodgers[33] finds no statistically significant unfavorable returns to gay men or lesbians. Going beyond the mean, Antecol et al.[34] is the only study that employs DFL decomposition and it finds that there is no significant difference in wage distributions between LGB people and their heterosexual counterparts. Berg and Lien[35] used GSS data from 1991-1996 and controlled age, race, education, experience, region, and occupation. Antecol et al. used 2000 Census data. The characteristics they controlled for are age, race, education, occupation, experience, and region. Rodgers used Weber State University Alumni and Students Survey, and controlled for age, race, education, GPA, public/private sector, experience, and marital status.

There are also a few studies on the state level. Carpenter[36] used the California Health Interview Survey and found that gay men earn 2-3% less than heterosexual men, and lesbians

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[30] Black et al., The Earnings Effects of Sexual Orientation.; Clain and Leppel, An Investigation into Sexual Orientation Discrimination as an Explanation for Wage Differences.

[31] Nathan Berg and Donald Lien, Measuring The Effect Of Sexual Orientation On Income: Evidence Of Discrimination? *Contemporary Economic Policy* 20, no. 4 (2002)
; Cusing-Daniels, Wage Penalties And Sexual Orientation: An Update Using The General Social Survey.

[32] Antecol et al., The Sexual Orientation Wage Gap: The Role of Occupational Sorting and Human Capital; Berg and Lien, Measuring The Effect Of Sexual Orientation On Income: Evidence Of Discrimination?

[33] Michael Scott Rodgers, Sexual Orientation Based Wage Discrimination in the Utah Labor Market, *Proceedings of National Conference On Undergraduate Research*, April 2016.

[34] Antecol et al., The Sexual Orientation Wage Gap: The Role of Occupational Sorting and Human Capital.

[35] Berg and Lien, Measuring The Effect Of Sexual Orientation On Income: Evidence Of Discrimination?

[36] Christopher S. Carpenter, Self-Reported Sexual Orientation and Earnings: Evidence from California, *Industrial and Labor Relations Review* 58, no. 2 (January 01, 2005)

earn 3-6% less than heterosexual women. Bisexual men and women earn 10-15% and 6-10% lower respectively than their heterosexual counterparts. Rodgers[37] used Weber State University Alumni and Students Survey and found no statistically significant evidence of discrimination. Data in both studies are not deemed as representation of the labor force in their respective state. They suffer either oversampling or undersampling. Both surveys allow self-identification for sexual orientation, which implies some degree of endogeneity. In addition, the data in Rodgers' (2016) study is limited to college graduates only.

The interpretations of the differentials vary vastly. Some[38] interpreted the wage gap based on Becker's theory of household production[39]. Becker theorized that people make human capital investments decisions based on their expectation of traditional husband-and-wife household structure. In this household, men and women will specialize in non-household and household production respectively. Therefore, since their partners are likely to be working as well, gay men wouldn't have as much pressure to invest in workplace related human capital as heterosexual men do. Under this theory, unmarried women will earn more than married women since married women specialize more in household production. Lesbians are expected to earn more than heterosexual women as they expect that they will not form a traditional family or specialize in household production. Sources of human capital include innate ability, schooling, school quality and non-schooling investment, training, and pre-labor market influences[40]. Education attainment and experiences are the commonly used variables for human capital, even though the extent of them influencing the pay levels is very small[41]. Others consider the wage differentials as a direct result of discrimination[42], even though lesbians enjoy a positive wage differential. Compared with heterosexual women, lesbians accumulate more human capital in the work place, such as a higher level of education and a decreased likelihood of having children. Therefore, they would be expected to have a higher level of income. For their homosexuality, they suffer a wage

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[37] Rodgers, Sexual Orientation Based Wage Discrimination in the Utah Labor Market.

[38] Black et al., The Earnings Effects of Sexual Orientation.

[39] Becker, The Economics Of Discrimination.

[40] Daron Acemoglu and David Autor, Lectures in Labor Economics (reading).

[41] John E. Buckley, Collecting Data on Human Capital Variables, 1998.

[42] Badgett, The Wage Effects of Sexual Orientation Discrimination; Klawitter, Multilevel Analysis of the Effects of Antidiscrimination Policies on Earnings by Sexual Orientation.

penalty that is not large enough to offset their wage advantage. However, there is empirical evidence contradicting these interpretations on gay men wage penalty and lesbian wage premium. Some find that gay men and lesbians have a higher level of education than their heterosexual counterparts[43], which challenges Becker's household production theory, at least for gay men. Antecol et al.[44] also found that lesbians have higher returns than heterosexual women, which shows no evidence of discrimination.

In conclusion, research on sexual orientation wage gap, comparing to the vast literature on gender or racial wage gap, is clearly not as large. Data available for research is highly limited and methodology mostly reduces to analyzing the wage gap on average, using OLS regression models. Although there are several studies conducted to analyze the wage gap on state level, the surveys are not representative, making the results less reliable. In this paper, we offer a preliminary analysis of the sexual orientation wage gap on state level with state-wide representative data and a systematic comparison of the wage gaps between the two states, Massachusetts and Alabama, which have opposite records on acknowledging LGBT rights. In the next section, we will show how we use data from ACS, which is representative on state level to identify same-sex couples and decompose the wage gap with Oaxaca decomposition.

III. DATA AND METHODOLOGY

To reveal whether the sexual orientation wage gap changes with social movements, specifically discrimination, we first gathered data from the ACS via the Integrated Public Use Microdata Series (IPUMS). Then we identified same-sex couples through the RELATE variable. Finally, we performed Oaxaca-Blinder decomposition in each state to determine if over time there were any differences in attribution to differences in returns to characteristics of the wage gap.

We used one-year ACS data from 2001 to 2015, which includes relevant labor market and demographic characteristics. Since it is also representative at the state level, it was appropriate for our purpose of examining the wage gap by different states' progress in same-sex marriage.

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[43] Black et al., The Earnings Effects of Sexual Orientation; Antecol et al, The Sexual Orientation Wage Gap: The Role of Occupational Sorting and Human Capital.

[44] Antecol et al, The Sexual Orientation Wage Gap: The Role of Occupational Sorting and Human Capital.

There are in total 879,551 observations (See Table 1), with about 26,000 observations each year from 2001 to 2004 and 70,000 observations each year from 2005 to 2015.

Table 1 Number of Observations Each Year

Census Year	Total Number of Observations	Total Number of Observations Identified as Couple	Number of Observations Identified as Couple in Alabama	Number of Observations Identified as Couple in Massachusetts
2001	26,395	18,976	7,530	11,446
2002	23,631	17,240	7,070	10,170
2003	26,082	18,770	7,462	11,308
2004	26,005	18,820	7,490	11,330
2005	69,728	50,250	21,362	28,888
2006	69,864	50,452	21,414	29,038
2007	70,141	50,482	21,428	29,054
2008	70,391	50,256	21,270	28,,986
2009	70,834	50,486	21,570	28,916
2010	71,030	50,260	21,004	29,256
2011	71,141	49,884	20,594	29,290
2012	70,829	49,824	20,794	29,030
2013	70,912	50,030	20,404	29,626
2014	71,182	50,204	20,732	29,472
2015	71,386	50,260	20,752	29,508
Total	879,551	626,194	260,876	365,318

To identify a same-sex couple, we used the RELATE variable, which allows each household member to identify his or her relationship to the household head, including spouse and unmarried partner. The ACS allows a same-sex couple to identify each other as unmarried partner, even if they are married. As shown in Table1, the total number of observations that is identified as couple through the RELATE variable is about 70% of the total in each year. In addition, there are more observations in Massachusetts than in Alabama.

As previous literature indicated, we should be able to identify about 1% of the data as LGB couples. This indicates that there will be around 70-100 observations of gay men plus lesbians each year from 2001 to 2004 and 200-300 each year from 2005 to 2015. The limited number of observations of gay men and lesbians prompts up to merge the data into three five-year groups: 2001-2005, 2006-2010, and 2011-2015. After identifying the LGB couples, we proceed to

calculate the age difference of the couple. To avoid mismatching and to obtain a clearer pool of data, we eliminate all the observations with an age difference larger than 35 in the couple. In addition, we will also eliminate all the observations that show one of the partners is not earning any wages. Table 2 gives us the final version of the data for analysis in the next section. As mentioned before, the data we analyze here is for people who are either married or in a significant relationship, which does not entirely reflect the whole population.

There are in total 1695 gay men and 2351 lesbians identified in Massachusetts and 484 gay men and 544 lesbians in Alabama from 2001-2015 ACS data. We see that the number of observations of LGB people is growing in both states, which could be partially attributed to the growing sample size throughout the years. In Massachusetts, we are able to identify 1.7% of the men are identified as gay men and 1.9% of the women are identified as lesbians in 2001-2005. The number grows to 1.9% and 2.6% for gay men and lesbians respectively in 2011-2015. In Alabama, 0.9% of the men are identified as gay men in 2001-2005. It decreases to 0.8% in 2006-2010 and grows back to 0.9% later. The percentage for lesbians floats around 0.9% from 2001 to 2010 and grows to 1% in 2011-2015. The number of LGB couples identified in Massachusetts is more than in Alabama. This is not just because of a larger sample size in Massachusetts, but a larger percentage of LGB population as well. Massachusetts has well-known LGB communities whereas in Alabama, all eight major cities in the state are among the lowest in Municipal Equality Index, which demonstrates how well (or in Alabama's case, not well) the municipality laws support LGBT people living there[45].

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[45] Human Rights Campaign, Maps of State Laws and Policies, http://www.hrc.org/state_maps.

Table 2 Number of Observations of Coupled Gay Men and Lesbians and Their Hetero-sexual Counterparts in MA and AL

	MA				AL			
	Gay Men	Hetero-sexual Men	Lesbians	Hetero-sexual Women	Gay Men	Hetero-sexual Men	Lesbians	Hetero-sexual Women
2001-2005	336	19,227	382	19,566	109	11,555	108	11,692
2005-2010	642	37,813	967	38,525	185	23,545	213	23,919
2011-2015	717	36,697	1,002	37,590	190	20,533	223	20,958
Total	1695	93,737	2351	95,681	484	55,633	544	56,569

In Massachusetts, the percentage of people with high school or less education has been decreasing over the years, as shown in Table 3. The percentage of people with some college level of education has been decreasing as well, except for lesbians, although these decreases are much smaller than the percentages for high school or less. The percentage of people with advanced degrees has been increasing. For gay men, the percentage with college degree decreases from 37.54% to 32% from 2001-2005 to 2006-2010. Meanwhile, those with advanced degrees jumped from 19% to 29.38%. This fluctuation can be attributed to a relatively smaller sample size in the earlier years. In addition, we notice that more than 50% of heterosexual men and women do not have a college level education while about 60% of gay men and lesbians have at least a college degree.

In Alabama, we see that the percentage of people with high school or less education has been decreasing over the years while the percentage of those with some college has been increasing. The percentage of people with college degree has been increasing as well, but the extent of the increase is not as big as that of the decrease of percentage of people with high school degree. The exception here is that for lesbians, the percentage with a college degree has been floating around 20%. Similar to the situation in Massachusetts, gay men and lesbians have the smallest percentage of them with high school education. However, they have the highest percentage with some college degree. Heterosexual men have the highest percentage of high school degree and the lowest percentage of advanced degrees throughout the years. The percentage of heterosexual women with advanced degrees increases from 9.94% in 2001-2005 to 14.09% in 2011-2015. In

Alabama, there are much higher percentages of people without a college degree than in Massachusetts. While most people in Massachusetts have a college degree, most in Alabama have some college level education but not a college degree. Heterosexual men, in both states have the highest percentage with high school degree and the lowest with advanced degrees.

Table 3 Percentage of Education Attainment for Gay Men and Lesbians and Their Hetero-Sexual Counterparts in MA and AL

	MA				AL			
	Gay men	Hetero-sexual Men	Lesbians	Hetero-sexual Women	Gay men	Hetero-sexual Men	Lesbians	Hetero-sexual Women
2001-2005								
High School	19.3%	33.3%	13.7%	28.4%	39.1%	43.1%	24.4%	36.7%
Some College	23.8%	24.0%	21.2%	28.2%	31.9%	30.8%	40.0%	35.3%
College	37.5%	24.2%	30.5%	25.3%	18.0%	17.0%	20.8%	18.1%
Advanced Degree	19.0%	18.0%	35.0%	18.2%	11.1%	9.2%	14.8%	9.9%
2006-2010								
High School	16.0%	30.0%	15.0%	23.6%	22.4%	40.1%	26.3%	32.7%
Some College	22.0%	24.0%	20.7%	27.5%	46.8%	31.7%	40.9%	34.8%
College	32.0%	26.0%	27.5%	27.7%	19.7%	18.7%	18.4%	20.7%
Advanced Degree	29.4%	20.1%	37.2%	21.2%	11.1%	9.5%	14.4%	11.7%
2011-2015								
High School	12.8%	27.1%	9.5%	19.7%	25.4%	35.5%	26.7%	27.1%
Some College	21.4%	23.2%	22.4%	26.0%	31.8%	33.3%	37.4%	35.4%
College	33.1%	28.2%	28.2%	29.4%	29.7%	20.3%	21.7%	23.4%
Advanced Degree	32.8%	21.5%	39.9%	25.0%	13.0%	11.0%	14.2%	14.1%

Douglas and Steinberger[46] find that visible minority gay men and lesbians are more likely to reveal their sexual orientation than white gay men and lesbians. Their conclusions are basing

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[46] Jamie H. Douglas and Michael D. Steinberger, The Sexual Orientation Wage Gap for Racial Minorities, *Industrial Relations: A Journal of Economy and Society* 54, no. 1 (2014).

calculations directly on the number of observations. With weighted data, however, we find that there are lower percentages of LGB minorities, as shown in Table 4. In Massachusetts, the percentage of non-white gay men increased from 12.7% to 17%. The percentage of non-white lesbians, on the other hand, is relatively smaller. There are 35 observations of non-white gay men and 27 non-white lesbians in 2001-2005. The numbers increase to 104 for both won-white gay men and lesbians in 2011-2015. However, there are many more observations of white lesbians than white gay men throughout the years.

In Alabama, the percentage of non-whites for all four groups and all years is higher than in Massachusetts. There are 20.3% non-white gay men and 17.3% non-white lesbians in 2001-2005. The numbers become 19.7% and 24.4% for non-white gay men and lesbians respectively in 2011-2015. The percentage of non-white gay men and lesbians is smaller than the percentage of their heterosexual counterparts, except for in 2011-2015 where there are 24.4% non-white lesbians and 22.5% non-white heterosexual women. The number of observations of non-white gay men increases from 16 to 36 from 2001-2005 to 2011-2015, and for white gay men, the number increases from 93 to 154. The number of observations of non-white and white lesbians is 12 and 96 respectively in 2001-2005. The number increases to 44 and 179 respectively in 2011-2015.

Table 4 The Percentages and The Number of Observations of White and Non-White Gay Men, Lesbians and Their Heterosexual Counterparts in MA and AL

		MA				AL			
		Gay men	Hetero-sexual Men	Lesbians	Hetero-sexual Women	Gay men	Hetero-sexual Men	Lesbians	Hetero-sexual Women
2001-2005									
Non-White	Percentage	12.70%	15.20%	6.40%	14.20%	20.30%	21.70%	17.30%	20.80%
	Number of Obs	35	2,225	27	2,206	16	2,161	12	2,183
White	Percentage	87.30%	84.80%	93.60%	85.80%	79.70%	78.30%	82.70%	79.20%
	Number of Obs	301	17,002	355	17,360	93	9,394	96	9,509
2006-2010									
Non-White	Percentage	15.60%	16.40%	8.80%	15.70%	16.50%	22.60%	13.50%	21.60%
	Number of Obs	85	5,083	84	5,236	29	4,473	28	4,470
White	Percentage	84.40%	83.70%	91.20%	84.40%	83.50%	77.40%	86.50%	78.40%
	Number of Obs	557	32,730	883	33,289	156	19,072	185	19,449
2011-2015									
Non-White	Percentage	17.00%	19.10%	11.10%	18.70%	19.70%	23.30%	24.40%	22.50%
	Number of Obs	104	5937	104	6115	36	3967	44	3977
White	Percentage	83.00%	80.90%	88.90%	81.30%	80.30%	76.70%	75.60%	77.50%
	Number of Obs	613	30760	898	31475	154	16566	179	16981

Table 5 summarizes the average age of gay men, lesbians, and their heterosexual counterparts. In Massachusetts, heterosexual men have the highest average age across the years and the number is growing. Average age for heterosexual women is growing from 43 to 45. Average age for gay men in 2001-2005 is 41 and it increases to 44 in 2006-2010 and 2011-2015. For lesbians, average age is remaining around 44. In Alabama, the average age of each group is smaller than in Massachusetts. Heterosexual men in Alabama also have the highest average age in all four groups across the years. Average ages for gay men, lesbians, and heterosexual women are very close to each other.

Table 5 Average Age of Gay Men, Lesbian Women, and Their Heterosexual Counterparts in MA and AL

	MA				AL			
	Gay Men	Hetero-sexual Men	Lesbians	Hetero-sexual Women	Gay Men	Hetero-sexual Men	Lesbians	Hetero-sexual Women
2001-2005	41	44	44	43	42	43	42	41
2006-2010	44	45	44	44	41	44	41	42
2011-2015	44	46	43	45	43	45	42	43

Table 6 summarizes the percentages of married people in each group in both states. From 2001 to 2010, there are no married gay or lesbian couples in both states. The percentages of married heterosexual couples, both men and women are decreasing overtime. In 2011-2015, there are 30.1% married gay men and 37.6% married lesbians in Massachusetts, and 25.8% and 19% respectively in Alabama. In addition, there are much more married heterosexual couples in Alabama than in Massachusetts.

Table 6 Percentage of Married Couple in Each group in MA and AL

	MA				AL			
	Gay Men	Hetero-sexual Men	Lesbians	Hetero-sexual Women	Gay Men	Hetero-sexual Men	Lesbians	Hetero-sexual Women
2001-2005		88.60%		88.90%		93.30%		93.50%
2006-2010		87.20%		87.50%		91.60%		92.10%
2011-2015	30.10%	86.00%	37.60%	86.30%	25.80%	91.10%	19.00%	91.50%

Table 7 shows the weighted average wage of each category for gay men, heterosexual men, lesbians, and heterosexual women for each year group in both states. We observe that on average, gay men have lower wages than heterosexual men, and lesbians have higher wages than heterosexual women in both states across year groups. The wage gap is closing over the years for both states as well. In addition the wage gap in Massachusetts is relatively smaller than in Alabama.

Next we will get into details of the average wage in each occupation across time for each state. We will start with Massachusetts, comparing the homosexual groups with heterosexual counterparts, then we move on to Alabama, and finally we will compare the two states.

For gay men in Massachusetts, average wage for all occupations, except construction, increased from the 2001-2005 to the 2006-2010 period. The average wage for construction, management, production, and sales occupations increased from 2006-2010 to 2011-2015 while others decreased. Production has the lowest average wage and management has the highest for gay men in 2001-2005. Average wage for management remained the highest throughout the years while the lowest became farming occupations in 2006-2010 and 2011-2015. The second highest wage on average was construction occupation in 2001-2005 and it became the sales occupation later.

For lesbians in Massachusetts, the occupation with highest wage on average is also management, while the lowest were service, farming and military in 2001-2005, 2006-2010 and 2011-2015 respectively. The occupation with the second highest wage was sales for lesbians in 2001-2005 and 2011-2015, and construction in 2006-2010. Lesbian women's wage on average is growing very slowly. Average wage for construction increased 50% from 2001-2005 to 2006-

2010 and decreased just as much later. There has been a very small increase in management occupation's average wage, and the wage for services and sales has been decreasing over time.

Heterosexual men's wage decreased from 2001-2005 to 2006-2010 except for management, military and service occupation. Average wage for sales bounced back in 2011-2015, while average for construction, farming, production, and service continued to decrease. Management occupation's average wage has been increasing throughout the time. Heterosexual men have the highest wage on average in management occupation and the lowest in farming across the years, which is also true for heterosexual women. Heterosexual men in general have the highest average wage across occupations except for military in all year groups and production occupation in 2011-2015. In the production occupations, heterosexual men's wage was almost twice as much as gay men's in 2001-2005 and became 11% lower than gay men's in 2011-2015.

Heterosexual women have the lowest wage on average in almost all occupations across time. They experienced decrease in construction and production from 2001-2005 to 2006-2010 and bounced back. The average wage for military occupations continued to decrease while average wage for management, sales and services occupation continued to increase.

In Alabama, average wages for almost every occupation for all people in all year groups are lower than in Massachusetts. Heterosexual men also have the highest wage in almost every occupation throughout the years, and the gap seems to be much larger. Heterosexual women have the lowest average wage in all occupations throughout the years.

Gay men experienced increase in construction, management, and sales throughout the years. Their wage in production and service decreased from 2006-2010. The highest and second highest paying occupation for them are management and construction respectively in 2001-2005, military and management in 2006-2010, and management and sales in 2011-2015. The lowest paying occupation has been service occupation throughout the years.

For lesbians, average wage generally increased from 2001-2005 to 2006-2010 across all occupations, except for service occupations. However, after that they experienced decrease in average wage across occupations except for production. The highest and the second highest paying occupation for lesbians were management and service in 2001-2005, military and management in 2006-2010, and management and production in 2011-2015. There was strong volatility in lesbians' average wage across occupations over the years. The total average was lower than its 2001-2005 level.

Heterosexual men experienced decrease in farming and military from 2001-2005 to 2006-2010. Other occupations experienced small increases except for management. From 2006-2010 to 2011-2015, military, sales, and service occupations experienced decrease in average wage while the rest experienced very small increases. The highest and second highest paying occupation were management and military across years while the lowest was service.

For heterosexual women, they generally experienced increase in average wage across occupations except for construction from 2001-2005 to 2006-2010. Average wage for construction continued to decrease, along with farming and sales. Management, production and service experienced very small increases, while for military the increase was huge. The highest and the second highest paying occupations for heterosexual women were military and management across the years while the lowest was service, similar to heterosexual men's situation.

The extent of increase for heterosexual men's wages is not as much as for gay men's in general. Lesbian's wages, on the other hand do not increase as much as heterosexual women's. Many occupations showed decrease in average wages from 2001-2005 to 2006-2010. Some bounced back later while some continued to decrease. This could be attributed to the Great Recession in 2007-2009 and relatively weak recovery afterwards.

Table 7 Average Wage of Gay Men, Lesbians and Their Heterosexual Counterparts in MA and AL

	Gay Men	Hetero-sexual Men	Lesbians	Hetero-sexual Women	Gay Men	Hetero-sexual Men	Lesbians	Hetero-sexual Women
	MA				AL			
2001-2005								
Construction	41185	41697	29918	30993	26128	29374	25462	24995
Farming		30998		9955	21325	26617		12975
Management	56462	60788	44337	35399	38511	42982	32941	25080
Military		35982		48731		49028		36031
Production	17636	33897	27892	19954	19026	30240	17367	16212
Sales	39553	51314	41452	26592	20260	39142	24673	19514
Service	22467	35336	27626	16182	16627	25082	28210	11467
Total	50076	54103	42598	31721	30872	38214	29512	22301
2006-2010								
Construction	30565	39552	44336	30291	28164	30866	32072	23445
Farming	24466	29899	10094	12582		24808		17543
Management	64292	73198	51888	43072	40525	56220	46984	31643
Military	42952	39153		33763	49560	43944	56280	37106
Production	33114	33584	24568	19510	21474	30404	26561	17003
Sales	44128	52131	39682	26850	27688	40319	26670	20365
Service	28187	33902	26931	16396	18862	25900	16904	12042
Total	54031	55344	44998	33664	30382	39758	32607	23884
2011-2015								
Construction	36317	39146	31874	32381	33377	31542	25654	20960
Farming	15301	28833	17641	10058		24924		12006
Management	65846	74094	53386	46302	43921	56612	34194	32134
Military	38640	34442	13296	17875		42590		48016
Production	35459	33041	27369	21161	20765	30932	29428	17045
Sales	48574	54139	33642	28533	34240	38032	15387	19768
Service	25965	33850	16786	24751	16464	24674	16257	13090
Total	56266	56477	45001	36560	33169	40450	25863	24522

Table 8 summarizes the percentage of gay men, lesbians, and their heterosexual counterparts in each occupation. The gender makeup of each occupation is more or less the same between

both states. There is a relatively higher percentage of males in Massachusetts in construction/extraction, management, sales, and services occupations, while it is lower in farming/fishing, military, and production occupations. Given the limited number of observations of gay men and lesbians in military and farming/fishing occupations, we will exclude these two occupations from further analysis. We see that in Massachusetts, management occupations have the highest percentage of gay and lesbian people while in Alabama, production/transportation have the highest percentage of gay men and sales have the highest percentage of lesbians. We also observe that there are higher percentages of gay and lesbian people in all occupations in Massachusetts than that in Alabama. The results are somewhat inconsistent with Badgett's findings[47], which showed that gay men are overrepresented in professional/technical, clerical/sales, and service occupations while lesbians are overrepresented in service, craft/operative, and managerial occupations[48].

Table 8 Percentage of Gay Men and Lesbians and Their Heterosexual Counterparts in Each Occupation in MA and AL

	Construction	Farming	Management	Military	Production	Sales	Service
MA							
Gay Men	0.36%	1.67%	0.95%	0.54%	0.46%	0.78%	0.66%
Hetero-sexual Men	96.49%	69.15%	45.95%	85.11%	75.12%	35.94%	44.79%
Hetero-sexual Women	2.82%	28.22%	51.84%	13.63%	23.88%	62.36%	53.60%
Lesbian Women	0.34%	0.96%	1.25%	0.72%	0.54%	0.92%	0.95%
AL							
Gay Men	0.19%	0.13%	0.37%	0.13%	0.48%	0.43%	0.41%
Hetero-sexual Men	95.80%	73.67%	44.59%	86.16%	76.52%	31.60%	41.08%
Hetero-sexual Women	3.75%	26.20%	54.63%	13.46%	22.66%	67.48%	58.08%
Lesbian Women	0.26%	0.00%	0.41%	0.25%	0.33%	0.49%	0.44%

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[47] Badgett, The Wage Effects of Sexual Orientation Discrimination.

[48] They organized occupations into five categories: professional/technical, managerial, clerical/sales, services, and craft/operative. In addition, these results are on national level.

In Massachusetts, management and sales occupations are the top 2 occupation choices for all groups, as shown in Table 9. They make up about 84% of the total for gay men, lesbians and heterosexual women, and somewhat less, 66.8% for heterosexual men. For them, the distribution is less concentrated than the other three groups. 11.62% of heterosexual men are in construction/extraction occupations while less than 3% of gay, lesbian and heterosexual women are in them. 11.36% of heterosexual men are in production/transportation occupations while it is about 4% for the other three groups. 14% of heterosexual men are in sales and 9.91% are in services while 18.22% of gay men are in sales and only 8.75% are in services. In Alabama, management and sales are the top two choices for gay men, lesbians, and heterosexual women while management and production/transportation are the two top choices for heterosexual men. Management and sales make up about 70% to 80% of the total for gay men, lesbians, and heterosexual women while management and production make up 62% for heterosexual men. Though management is still the top choice for all groups, the percentage is significantly lower in Alabama than that in Massachusetts. 66% of gay men in Massachusetts are in management while only 45% of them are in management in Alabama. 18.22% are in sales in Massachusetts while 24% are in sales in Alabama. The same pattern follows for heterosexual women and lesbians. Heterosexual men's occupation distribution is less concentrated than the other three groups as well in Alabama. 14.96% of them are in construction/extraction while that number is 3.91% for gay men, 5% for lesbians, and 0.59% for heterosexual women. 20% of heterosexual men are in production/transportation, while only 6% of heterosexual women, and 10% to 16% of gay men and lesbians are in this occupation. Gay men and lesbian women's occupation choices are more similar to each other between the two states than their heterosexual counterparts. In addition, as we showed in Table 7 both gay men and lesbians earn relatively higher wages in management and sales occupations, in which their occupations are more concentrated.

Table 9 Occupation Choices of Gay Men and Lesbians and Their Heterosexual Counterparts in MA and AL

	Construction	Farming	Management	Military	Production	Sales	Service
MA							
Gay Men	2.60%	0.26%	65.97%	0.05%	4.16%	18.22%	8.75%
Hetero-sexual Men	11.62%	0.18%	52.80%	0.13%	11.36%	14.00%	9.91%
Hetero-sexual Women	0.34%	0.07%	59.72%	0.02%	3.62%	24.34%	11.89%
Lesbian Women	1.89%	0.12%	67.43%	0.05%	3.84%	16.79%	9.88%
AL							
Gay Men	3.91%	0.14%	45.06%	0.09%	16.35%	24.02%	10.43%
Hetero-sexual Men	14.96%	0.59%	42.05%	0.47%	20.08%	13.63%	8.22%
Hetero-sexual Women	0.59%	0.21%	52.00%	0.07%	6.00%	29.38%	11.73%
Lesbian Women	5.00%	0.00%	47.21%	0.17%	10.67%	26.16%	10.79%

To isolate the effect of gay men and lesbian's concentration in high-paying occupations from the wage gap, we conduct OLS regression and Oaxaca decomposition. For OLS regression, variables of interest include, as shown in Equation 1: age, age squared, education attainment, marital status, race, occupation[49]. We will also adjust wage to 1999 price level and take log of it as dependent variable. This regression model will be performed for gay men, lesbians, and their heterosexual counterparts separately in both states for all year groups. It provides us an opportunity to see if there are significant differences in coefficients of the variables between homosexual couples and heterosexual couples.

Equation 1

$$Lnwage = \beta_0 + \beta_1 * age + \beta_2 * age\ squared + \beta_3 * education + \beta_4 * married + \beta_5 * white + \beta_6 * occupation + \varepsilon$$

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[49] Since the number of observations of LGB couple available is still limited, we want to avoid over-categorizing of each variable. Education is categorized into: High School or Less, Some College, College, and Advanced Degree. Marital Status is a binary variable of married or not. Race is a binary variable as well: white and non-white. Occupation is separated into 7 categories: construction, extraction and maintenance occupations; farming, fishing and forestry occupations; management, professional and related occupations; military specific occupations; production, transportation and material moving occupations; sales and office occupations; service occupations.

As the number of observations for gay men and lesbians is significantly smaller than their heterosexual counterparts, we are concerned that the sample is not representative enough. Therefore, we will run OLS regression of gay men and lesbians with weights and estimate Cook's distance to detect outliers. In addition to eliminating outliers, we will bootstrap the regression as well. The standard errors of the bootstrapped coefficients of the regression give us information on the robustness of the result.

In addition to OLS regression, we will decompose the wage gap with Oaxaca decomposition. This method provides us information on how much of the wage gap is attributed to differences in characteristics and how much to differences in returns to characteristics, which has important implications for labor market discrimination between gay men, lesbians, and their heterosexual counterparts. Oaxaca decomposition consists of two regression models, one for homosexual couples and one for heterosexual couples. Both models have the same variables as shown in Equation 1. It decomposes the mean wage gap between heterosexual couple and homosexual couple, as demonstrated in Equation 2. $\overline{W}_{HE}$ represents average log of wage of the heterosexuals while $\overline{W}_{HO}$ does the same for the homosexuals. β and $\overline{X}$ each represent a matrix of coefficients and of average characteristics respectively. Equation 3 is the final version of the decomposition, where the first part $\beta_{HE} * (\overline{X}_{HE} - \overline{X}_{HO})$ is the portion of the wage gap that is attributed to the differences in characteristics and the second part is the portion due to differences in returns to characteristics.

Equation 2

$$\overline{W}_{HE} - \overline{W}_{HO} = \beta_{HE} * \overline{X}_{HE} - \beta_{HO} * \overline{X}_{HO}$$

Equation 3

$$\overline{W}_{HE} - \overline{W}_{HO} = \beta_{HE} * (\overline{X}_{HE} - \overline{X}_{HO}) + (\beta_{HE} - \beta_{HO}) * \overline{X}_{HO}$$

The descriptive analysis of the ACS data in both states shows that the numbers of LGB observations are increasing over time. There are more LGB observations in Massachusetts than in Alabama. Alabama has a higher percentage of non-white LGB and higher percentage of married heterosexual couples. However, Massachusetts has a higher percentage of married LGB couples. LGB people generally have higher level of education than their heterosexual counterparts in both states, though people in Massachusetts generally have higher level of

education attainment. LGB people are also more concentrated in higher-paying occupations more than heterosexual people. To isolate the effects of the LGB identity on the wage gap, we perform OLS regressions to control for all other variables. In addition, to find out whether there is actual discrimination against LGB people, we conduct Oaxaca decomposition to estimate the portion of the gap that's caused by the differences in the returns to characteristics. We now discuss the results of these procedures.

IV. RESULTS

Since the number of observations for gay men and lesbians is much smaller than their heterosexual counterparts, we first conduct OLS regression of log of the wage, as specified in Equation 1, for gay men and lesbians in both states to check for consistencies of the coefficients. Appendix Table A-1 and A-2 show the original coefficients in the OLS model. We found that the coefficients are counterintuitive for several variables. For example, for lesbians in Massachusetts, it shows negative coefficients for some college education, comparing with high school education. It also shows a decreasing trend of coefficients for college. For gay men, in Massachusetts, the coefficient for advanced degrees is slightly smaller than the coefficient for college in 2001-2005. Meanwhile, the coefficients for heterosexual men and women are relatively more consistent. This suggests that either there is an issue with the data (oversampling or undersampling), that the effects of these variables on LGB people are more volatile or a combination of these effects. This implies that the results might not reflect the reality, which leads us to bootstrap the regression for gay men and lesbians in both states, as shown in Appendix (Table A-3 to Table A-6).

Table 10 shows the marginal effects on the average log wage of each variable for both gay men and heterosexual men in Massachusetts. We see that the effect of education for heterosexual men decreased a lot from 2001-2005 to 2006-2010, and that for college and advanced degrees, the effects continue to decrease. For gay men, the marginal effects of education are increasing over time. The marginal effects of college and advanced degrees were smaller for gay men than for heterosexual men in 2001-2005, but became much larger in 2011-2015. The effects of white premium for gay men have been decreasing over time while for heterosexual men, they have been steady. Effects of marriage premium for heterosexual men have been relatively steady. However, for gay men, the effect was -4.2%, much different than the 15%-18% for heterosexual

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men. The marginal effects of occupation for heterosexual men generally decreased from 2001-2005 to 2006-2010 and remained at similar level. For gay men, the marginal effects of construction, farming, production and military occupations decreased from 2006-2010 to 2011-2015. The effects of service, construction and military occupations for gay men were generally higher than for heterosexual men.

Table 10 Marginal Effects of Each Variable on Average for Gay Men and Heterosexual Men in MA

	Gay Men			Heterosexual Men		
	2001-2005	2006-2010	2011-2015	2001-2005	2006-2010	2011-2015
Age	-0.9%	4.2%	2.7%	2.2%	3.3%	2.8%
Married			-4.2%	17.7%	15.5%	16.1%
Some College	8.8%	17.2%	21.2%	16.8%	12.0%	22.8%
College	43.0%	48.4%	45.9%	52.8%	38.0%	33.5%
Advanced Degree	47.7%	68.1%	75.3%	81.1%	65.0%	42.4%
White	39.1%	8.0%	3.1%	23.7%	24.9%	24.3%
Service	-15.4%	-32.8%	-35.5%	-26.1%	-39.8%	-39.6%
Sales	6.8%	-23.7%	-20.9%	-11.2%	-21.3%	-19.9%
Farming		21.2%	-74.2%	-40.2%	-46.6%	-52.7%
Construction	4.3%	-17.1%	14.6%	-5.5%	-22.9%	-22.0%
Production	-63.4%	-9.9%	-23.8%	-22.8%	-34.8%	-33.7%
Military		20.1%	10.3%	-8.2%	-18.3%	-29.0%

For gay men in Alabama, as shown in Table 11, the marginal effects of education were much higher than for heterosexual men in 2001-2005. The effects for heterosexual men decreased in 2006-2010 but not as much as for gay men. The effects for both gay men and heterosexual men bounced back to some degree in 2011-2015. But effects became larger for heterosexual men than for gay men. The effects of white premium for gay men have been decreasing from 62.3% to -39.7%. Although this also happened in Massachusetts, the range for gay men in Alabama is much larger. The effects of white premium for heterosexual men remained relatively steady over time, which is also similar in trend to Massachusetts, but they were smaller compared to Massachusetts. The marginal effects of one extra year of age have been decreasing for gay men, from 3.1% to -2.2%, but remained steady for heterosexual men around 1.5%. The effect of marriage premium was also negative for gay men in Alabama. For heterosexual men, it showed a decreasing trend, but still larger than in Massachusetts. The marginal effects of occupations for heterosexual men generally decreased from 2001-2005 to 2006-2010, similar to Massachusetts,

and they remained stable in 2011-2015 except for military. The effects of services, construction, and production for gay men have been decreasing over time. For sales, it remained steady, but at a lower level than for heterosexual men. However, since the confidence interval for advanced degree for gay men in 2011-2015 is -0.523 to 0.735 (See Appendix Table A-6), these results are very reliable.

Table 11 Marginal Effects of Each Variable on Average for Gay Men and Heterosexual Men in AL

	Gay Men			Heterosexual Men		
	2001-2005	2006-2010	2011-2015	2001-2005	2006-2010	2011-2015
Age	3.1%	-0.5%	-2.2%	1.2%	1.4%	1.7%
Married			-6.7%	28.5%	20.9%	19.8%
Some College	44.5%	-9.7%	3.8%	22.6%	19.8%	23.0%
College	104.8%	4.3%	36.4%	68.4%	48.6%	56.2%
Advanced Degree	110.4%	7.1%	10.8%	91.9%	73.0%	73.3%
White	62.3%	18.7%	-39.7%	20.5%	21.3%	18.8%
Service	-27.2%	-55.2%	-70.9%	-26.7%	-38.5%	-41.6%
Sales	-22.9%	-21.0%	-27.5%	-7.4%	-19.7%	-24.9%
Farming	73.2%			-27.1%	-41.3%	-37.6%
Construction	31.5%	8.3%	-13.9%	-10.8%	-22.3%	-22.0%
Production	-15.7%	-30.8%	-48.0%	-7.2%	-23.2%	-21.3%
Military		138.0%		23.0%	-1.4%	5.8%

The marginal effects of age for heterosexual women in Massachusetts were negative, contrary to that heterosexual men (see Table 12). The effects of being married for heterosexual women were negative as well, ranging from -10% to -17%. For lesbians, the effect of being married is only -0.1%, much smaller than for heterosexual women. The marginal effects of education for lesbians are generally smaller than for heterosexual women. For lesbian women, education's effect increased from 2001-2005 to 2006-2010 then decreased in 2011-2015. For heterosexual women, the effects decreased from 2001-2005 to 2006-2010 then increased in 2011-2015. The effects of white premium for lesbians were very small in 2001-2005 compared to them in later years. For heterosexual women, the effects of white premium were similar to lesbians' in 2001-2005 but decreased to -4.6% in 2005-2010 then bounced back to 2.3%. The effects of sales occupation for lesbian women showed decreasing trend over the years. For production occupation, the effects are relatively steady. For construction and service occupations, the effects increased from 2001-2005 to 2006-2010, then decreased in 2011-2015.

For heterosexual women, the effects of occupations generally decreased from 2001-2005 to 2006-2010. For farming, production and military occupations, the effects continued to decrease in 2011-2015 whereas others remained steady, a similar pattern with heterosexual men's in Massachusetts.

Table 12 Marginal Effects of Each Variable on Average for Lesbian Women and Heterosexual Women in MA

	Lesbian Women			Heterosexual Women		
	2001-2005	2006-2010	2011-2015	2001-2005	2006-2010	2011-2015
Age	1.7%	3.4%	-0.7%	-2.9%	-2.8%	-1.4%
Married			-0.1%	-12.9%	-17.2%	-10.5%
Some College	-10.7%	2.0%	1.8%	20.6%	6.5%	9.2%
College	22.3%	16.3%	12.7%	54.3%	22.0%	25.1%
Advanced Degree	31.8%	35.6%	30.8%	102.6%	45.4%	51.7%
White	1.7%	13.4%	10.8%	1.6%	-4.6%	2.3%
Service	-50.8%	-38.5%	-46.5%	-42.3%	-56.3%	-55.6%
Sales	-3.0%	-19.2%	-24.3%	-11.1%	-28.3%	-29.5%
Farming		-70.4%	-56.3%	-65.7%	-67.4%	-77.2%
Construction	-10.0%	25.9%	-45.9%	5.4%	-17.6%	-15.5%
Production	-31.0%	-31.4%	-35.9%	-23.4%	-41.8%	-38.4%
Military			-30.0%	88.3%	18.8%	-53.1%

Table 13 shows the marginal effects of each variable on average for lesbians and heterosexual women in Alabama. We see that the effects of age for both lesbians and heterosexual women are decreasing over time, though the range is much larger for lesbians. The effects of being married for heterosexual women is positive, contrary to heterosexual women in Massachusetts, although very small in 2006-2010 and onwards. For lesbians, the effects of being married were also negative, but larger than that in Massachusetts. The results showed a decreasing trend for the marginal effects of education over time for both lesbians and heterosexual women. However, the effects are generally larger for lesbians than for heterosexual women, which is also contrary to the pattern presented in Table 12. The marginal effects of white premium for lesbians were very volatile. They were -61.6% in 2001-2005 and increased to 41.7% in 2006-2010 then decreased to -7.8%. Meanwhile, for heterosexual women, the effects of white premium were around -1% to -4%, which is also different from Massachusetts. Marginal effects of sales, construction, and production occupations were decreasing over time for

heterosexual women. Marginal effects of military for them, on the other hand, were increasing. For lesbian women, the marginal effects of sales and production occupations were decreasing as well, while for construction they have been increasing. The marginal effects for service occupations for both lesbian and heterosexual women decreased from 2001-2005 to 2006-2010, then increased in 2011-2015, although the effects were generally higher for lesbians than for heterosexual women.

Table 13 Marginal Effects of Each Variable on Average for Lesbians and Heterosexual Women in AL

	Lesbians			Heterosexual Women		
	2001-2005	2006-2010	2011-2015	2001-2005	2006-2010	2011-2015
Age	4.2%	3.0%	0.4%	1.6%	1.2%	-0.2%
Married			-5.3%	11.8%	1.2%	1.2%
Some College	50.0%	37.7%	33.6%	31.1%	15.4%	15.2%
College	128.8%	68.0%	57.3%	86.3%	39.9%	35.3%
Advanced Degree	168.4%	76.1%	69.9%	117.5%	74.1%	70.6%
White	-61.6%	41.7%	-7.8%	-2.1%	-1.0%	-3.9%
Service	-24.3%	-44.5%	-36.0%	-42.5%	-53.5%	-50.2%
Sales	3.6%	-22.9%	-46.8%	-5.0%	-21.7%	-25.3%
Farming				-43.6%	-42.8%	-58.1%
Construction	-7.2%	22.9%	39.5%	-2.2%	-4.7%	-24.3%
Production	33.0%	0.7%	-22.3%	-18.9%	-29.0%	-31.7%
Military		52.0%		35.4%	51.0%	58.4%

Next we perform the Oaxaca decomposition for the wage gap. Figure 1 shows the results of the decomposition of the wage gap between gay men and heterosexual men in both states and all three periods. We find that the wage gaps for both states are closing over time, while in Massachusetts, the wage gap is closing faster. The wage gap is also smaller in Massachusetts than in Alabama across time. In Massachusetts, the explained portion offsets a very large portion of the wage gap, ranging from 9.6% to 15.5%. The unexplained portion is the main factor of the wage gap. The unexplained portion is decreasing over time, from 38.3% to 16.7%. In 2011-2015, the unexplained portion is less than half of what it was in 2001-2005. In Alabama, the explained portion has very little impact in 2001-2005. It starts to offset relatively small portion of the wage gap in 2006-2010. The unexplained portion is also the main factor for the wage gap. Although it is decreasing over time, the extent of the decrease is much smaller than in Massachusetts.

Figure 1 Oaxaca Decomposition between Gay Men and Heterosexual Men in MA and AL
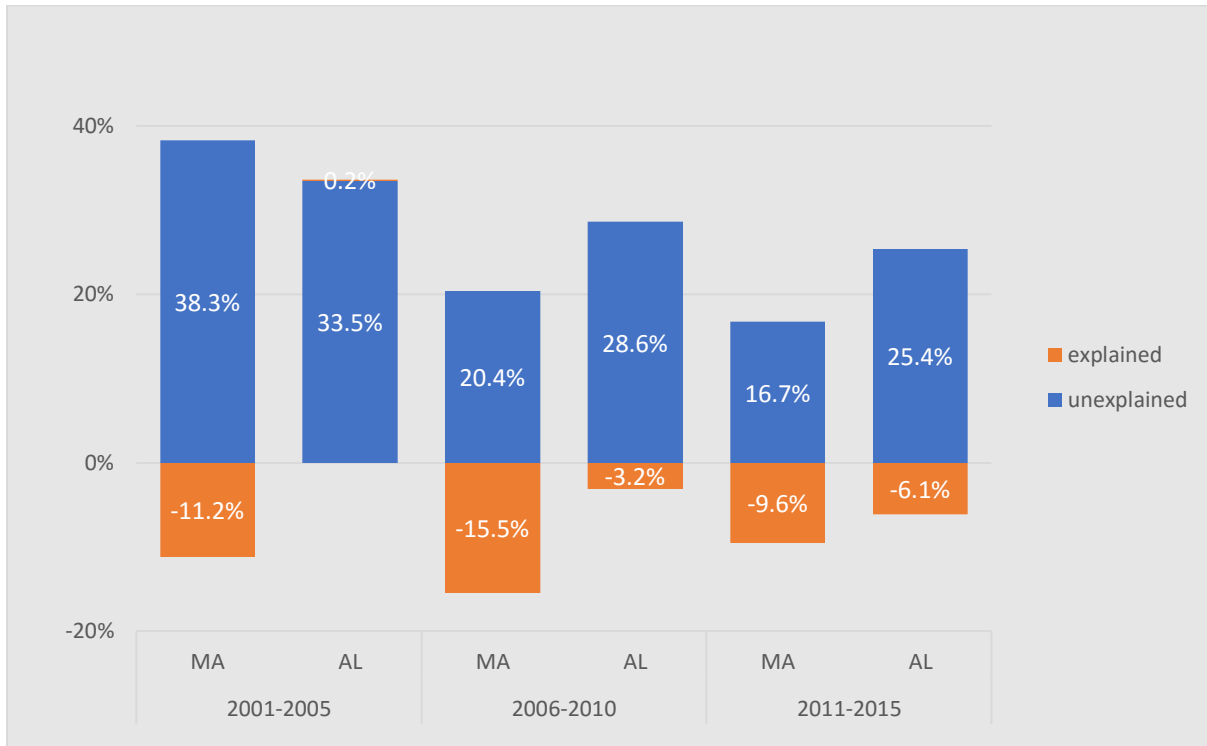
For the decomposition between lesbians and heterosexual women, the explained and unexplained portion both contribute to the wage gap. In Massachusetts, both explained and unexplained portion are in a decreasing trend overtime. Unexplained portion contributes to two thirds of the wage gap in 2001-2005 and about a half in 2011-2015. In Alabama, the explained portion is decreasing over time from -15% to -5%. The unexplained portion increases from -24.1% in 2001-2005 to -27% in 2006-2010. It significantly decreases to -4.1% in 2011-2015. The wage gap in Alabama is slightly smaller than in Massachusetts in 2001-2005. It becomes slightly larger in 2006-2010 and significantly smaller in 2011-2015.

Figure 2 Oaxaca Decomposition between Lesbian Women and Heterosexual Women in MA and AL
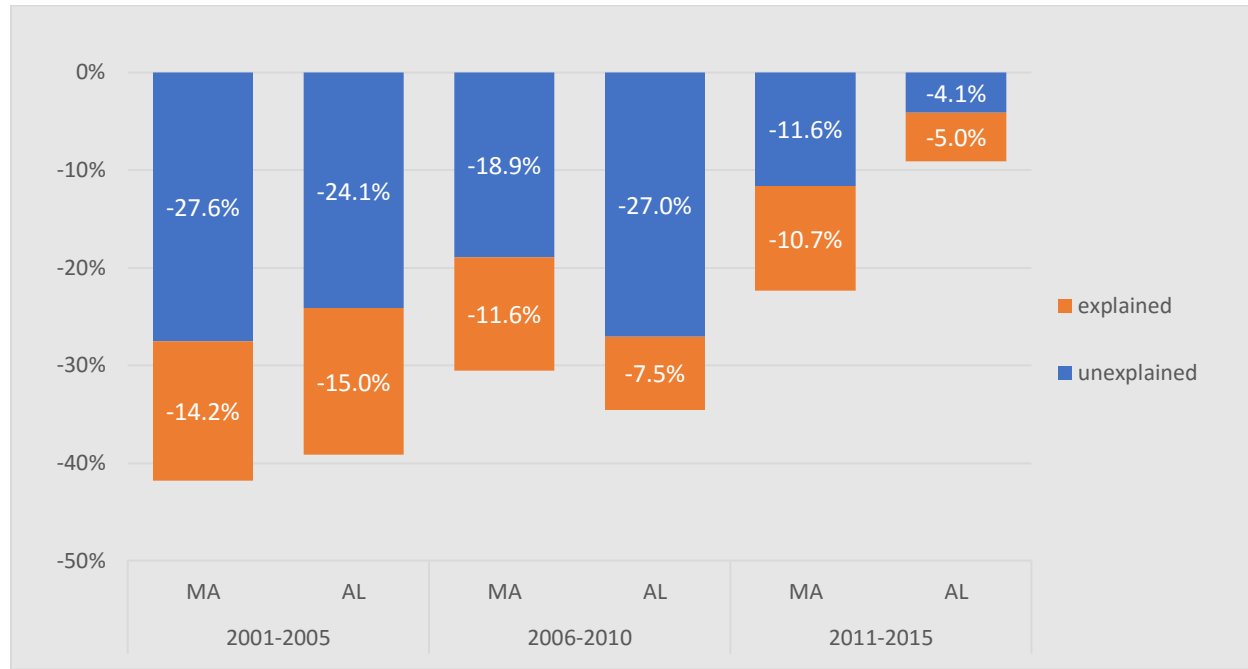
Our findings are not very different than previous literature reported. Berg and Lien[50] found that both gay men and lesbians' characteristics help to decrease the wage gap, about one third of it. Antecol et al.[51], on the other hand found that gay men's characteristics help to decrease the wage gap while lesbians' characteristics help increase it. However, the wage gap between gay men and married heterosexual men is mostly attributed to the differences in returns to characteristics while by 2011-2015 about half the wage gap between lesbians and heterosexual women is due to differences in characteristics. The gay men wage penalty and lesbian women wage premium is entirely due to differences in returns to characteristics, while for both groups characteristics alone would've given them higher wages than their heterosexual counterparts.

Our findings suggest that the sexual orientation wage gaps in Massachusetts and Alabama are very different from each other. The regression models indicate that returns to the characteristics show different trends over time between gay men, lesbians, and their heterosexual counterparts. Further decomposition implies that discrimination against gay men in the workplace is diminishing, although not to the same extent between the two states. Gay men's characteristics

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[50] Berg and Lien, Measuring The Effect Of Sexual Orientation On Income.

[51] Antecol et al., he Sexual Orientation Wage Gap: The Role of Occupational Sorting and Human Capital.

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have been helping to decrease a large portion of the wage gap in Massachusetts while they play a relatively smaller role in Alabama. Wage gap between lesbians and heterosexual women is generally larger than the gap between gay men and heterosexual men. Preferential treatments for lesbians in work place are decreasing, and their characteristics are contributing less to the wage gap as well.

V. CONCLUSION

In this paper, we examined the sexual orientation wage gap in Massachusetts and Alabama. Previous literature on the wage gap in United States mostly focuses on estimating the wage gap on the national level. We used data from ACS and analyzed the characteristics, such as education, race, and occupations and performed OLS regression and Oaxaca decomposition analysis of the wage gap on the state level. We show that the characteristics of LGB people can differ between states. In addition, not only are the wage gaps different between the two state, but how they evolve over time is different as well.

The number of observations for gay and lesbian people is much smaller when analyzing on state level. We do find that the number of observations is increasing as time progresses. There are significantly more gay and lesbian observations in Massachusetts than in Alabama, and we do find the analysis results in Massachusetts more consistent.

Gay men and lesbians in Massachusetts have higher educational attainment than those in Alabama. The number of gay/lesbian individuals with advanced degrees is highest in Massachusetts while in Alabama it is the highest for those with some college level of education. Heterosexual men have the highest percentage of people with high school degree in both states. Heterosexual women, on the other hand, have the most shift from high school degree to a higher level of education.

Occupations between gay men/ lesbians and their heterosexual counter parts vary as well. Most gay men and lesbians are in management, sales, and services occupations. Only a limited number of observations are in construction, farming and military occupations. Heterosexual men's occupation choices are the most evenly distributed across the seven categories, while heterosexual women's are most concentrated in management and sales occupation.

Regression analysis shows that gay men have higher returns to education than heterosexual men do in both states. Lesbians have higher returns to education in Alabama but lower in

Massachusetts. The marriage premium applies, but only to heterosexual men and has very limited impact on women's wage. White privilege also applies to heterosexual men but not to heterosexual women. The white privilege for gay men is decreasing over time. For lesbians, the white privilege is increasing over time in Massachusetts but shows unclear trend in Alabama.

Oaxaca decomposition showed that the wage gap is closing over time in both states. Gay men's wage penalty is mostly attributed to the unexplained part of the model, which suggests that they suffer unfavorable treatments in the workplace. The unexplained parts in both states are somewhat similar over time. The explained part for gay men in Massachusetts has been mitigating the wage gap, while in Alabama it plays a relatively smaller role. For lesbians in both states, it is shown that both the explained and unexplained portion are decreasing in general. The wage gaps in Massachusetts were larger than in Alabama in 2001-2005 and 2011-2015.

We do see that there is a big difference in wage gaps between Massachusetts and Alabama. For the gay men's wage penalty, the differences between the two states are attributed to the fact that gay men's characteristics help mitigate the gap in Massachusetts while enlarging it in Alabama. Lesbians' favorable treatments are decreasing in both states, but because of the unclear pattern revealed in Alabama, we are unable to draw conclusions from comparing the explained portion and unexplained portion over time between the two states. The lesbian wage premium is entirely due to their favorable treatments comparing to heterosexual women while for gay men the wage penalty is mostly attributed to their unfavorable treatment comparing to heterosexual men.

Our findings suggest that state with records of acknowledging LGBT rights tends to have smaller sexual orientation wage gap. The gap between gay men and heterosexual men being smaller in Massachusetts can be partially attributed to the fact that gay men's characteristics help in decreasing it. For lesbians, the majority of the wage gap is attributed to lesbians' favorable treatment in the labor market. Policies aiming at closing the sexual orientation wage gap cannot only focus on anti-discrimination policies, but improving opportunities for human capital of gay men and heterosexual women as well. Future research can focus on improving the robustness of the regression models, probably with data of better quality. It can also look into what causes the decreasing trend of the unexplained portion of the wage gap. One can compare institutional factors such as changes in anti-discrimination law over the years or changes in public opinions towards LGBT people. In addition, further research into discrimination theory is needed to

understand lesbians' favorable treatment in the labor market in contrast to gay men's unfavorable treatment.

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Appendix

Table A-1: Coefficients of OLS Regression for Gay Men and Lesbians in MA

	Gay Men			Lesbian		
	2001-2005	2006-2010	2011-2015	2001-2005	2006-2010	2011-2015
intercept	6.893	7.861	6.987	5.600	7.405	5.618
	(0.061)	(0.063)	(0.056)	(0.049)	(0.053)	(0.049)
age	0.120	0.099	0.123	0.200	0.115	0.205
	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
agesq	-0.001	-0.001	-0.001	-0.002	-0.001	-0.002
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
married			0.026			-0.080
			(0.008)			(0.007)
some college	0.121	0.288	0.331	-0.123	-0.002	-0.071
	(0.013)	(0.013)	(0.013)	(0.011)	(0.012)	(0.013)
college	0.712	0.616	0.732	0.245	0.224	0.149
	(0.013)	(0.013)	(0.013)	(0.01)	(0.012)	(0.012)
advanced degree	0.704	0.784	0.938	0.392	0.443	0.291
	(0.015)	(0.014)	(0.014)	(0.01)	(0.012)	(0.013)
white	0.438	0.102	0.016	0.082	0.183	0.224
	(0.013)	(0.011)	(0.01)	(0.013)	(0.012)	(0.01)
service	-0.021	-0.404	-0.411	-0.410	-0.474	-0.518
	(0.017)	(0.015)	(0.013)	(0.014)	(0.012)	(0.011)
sales	-0.067	-0.264	-0.263	-0.154	-0.186	-0.386
	(0.012)	(0.01)	(0.01)	(0.01)	(0.009)	(0.009)
farming		0.273	-1.389		-1.137	-0.890
		(0.047)	(0.11)		(0.102)	(0.069)
construction	0.217	-0.266	0.175	-0.100	0.214	-0.515
	(0.028)	(0.021)	(0.026)	(0.027)	(0.023)	(0.023)
production	-0.716	-0.131	-0.209	-0.769	-0.280	-0.506
	(0.024)	(0.02)	(0.018)	(0.02)	(0.015)	(0.019)
military		0.153	0.085			-0.144
		(0.109)	(0.187)			(0.087)

Table A-2: Coefficients of OLS Regression for Gay Men and Lesbian Women in AL

	Gay Men			Lesbian Women		
	2001-2005	2006-2010	2011-2015	2001-2005	2006-2010	2011-2015

intercept	5.212	7.789	8.524	6.471	6.802	7.321
	(0.096)	(0.099)	(0.09)	(0.099)	(0.077)	(0.102)
age	0.142	0.121	0.096	0.136	0.109	0.098
	(0.005)	(0.005)	(0.004)	(0.005)	(0.004)	(0.005)
agesq	-0.002	-0.001	-0.001	-0.002	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
married			0.064			-0.092
			(0.016)			(0.017)
some college	0.709	-0.04	-0.043	0.983	0.409	0.38
	(0.019)	(0.017)	(0.021)	(0.017)	(0.013)	(0.017)
college	0.886	-0.178	0.235	1.561	0.605	0.686
	(0.024)	(0.022)	(0.024)	(0.02)	(0.018)	(0.021)
advanced degree	1.098	0.155	0.04	1.509	0.753	0.901
	(0.029)	(0.026)	(0.028)	(0.023)	(0.02)	(0.025)
white	1.428	0.082	-0.34	-0.671	0.511	-0.137
	(0.022)	(0.018)	(0.017)	(0.018)	(0.016)	(0.016)
service	-0.129	-0.839	-1.146	0.106	-0.536	-0.365
	(0.031)	(0.024)	(0.024)	(0.032)	(0.019)	(0.022)
sales	-0.276	-0.475	-0.16	0.204	-0.303	-0.641
	(0.025)	(0.017)	(0.017)	(0.017)	(0.015)	(0.018)
farming	0.923					
	(0.123)					
construction	0.505	-0.289	-0.044	-0.34	0.088	0.114
	(0.035)	(0.037)	(0.046)	(0.034)	(0.021)	(0.043)
production	0.331	-0.655	-0.481	0.347	-0.056	-0.193
	(0.025)	(0.022)	(0.026)	(0.024)	(0.023)	(0.022)
military		0.812			0.478	
		(0.125)			(0.074)	

Table A-3: OLS Regression Results of Gay Men (Bootstrapped) and Heterosexual Men in MA

	Gay Men			Heterosexual Men		
	2001-2005	2006-2010	2011-2015	2001-2005	2006-2010	2011-2015
intercept	6.193	7.039	7.202	7.570	7.389	7.272
	(1)	(0.667)	(0.545)	(0.007)	(0.007)	(0.007)
age	0.153	0.130	0.118	0.111	0.125	0.123
	(0.049)	(0.03)	(0.025)	(0.000)	(0.000)	(0.000)
age squared	-0.002	-0.001	-0.001	-0.001	-0.001	-0.001

	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
married			-0.043	0.195	0.168	0.176
			(0.079)	(0.001)	(0.001)	(0.001)
Some college	0.1428	0.2874	0.3299	0.155	0.113	0.149
	(0.239)	(0.13)	(0.164)	(0.001)	(0.001)	(0.001)
college	0.562	0.662	0.614	0.424	0.322	0.408
	(0.219)	(0.131)	(0.161)	(0.001)	(0.001)	(0.001)
advanced degree	0.608	0.842	0.872	0.594	0.501	0.587
	(0.234)	(0.137)	(0.161)	(0.001)	(0.001)	(0.001)
white	0.496	0.083	0.031	0.270	0.287	0.279
	(0.221)	(0.097)	(0.106)	(0.001)	(0.001)	(0.001)
service	-0.167	-0.398	-0.438	-0.302	-0.508	-0.504
	(0.29)	(0.154)	(0.131)	(0.002)	(0.001)	(0.001)
sales	0.066	-0.270	-0.235	-0.119	-0.239	-0.222
	(0.136)	(0.087)	(0.094)	(0.001)	(0.001)	(0.001)
farming		0.192	-1.355	-0.515	-0.628	-0.749
		(0.598)	(0.106)	(0.01)	(0.009)	(0.01)
construction	0.042	-0.188	0.136	-0.057	-0.260	-0.248
	(0.206)	(0.194)	(0.178)	(0.001)	(0.001)	(0.002)
production	-1.005	-0.104	-0.272	-0.259	-0.427	-0.411
	(0.385)	(0.181)	(0.19)	(0.001)	(0.001)	(0.002)
military		0.183	0.098	-0.086	-0.202	-0.343
		(0.101)	(0.108)	(0.013)	(0.01)	(0.012)

Table A-4: OLS Regression Results of Lesbians (Bootstrapped) and Heterosexual Men in MA

	Lesbian Women			Heterosexual women		
	2001-2005	2006-2010	2011-2015	2001-2005	2006-2010	2011-2015
intercept	5.776	7.247	6.404	8.49	8.709	8.319
	(-0.882)	(-0.547)	(-0.543)	(-0.008)	(-0.008)	(-0.009)
age	0.191	0.122	0.167	0.058	0.065	0.077
	(0.038)	(0.025)	(0.025)	(0.000)	(0.000)	(0.000)
age squared	-0.002	-0.001	-0.002	-0.001	-0.001	-0.001
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
married			-0.001	-0.121	-0.159	-0.1
			(0.067)	(0.002)	(0.002)	(0.002)

Some college	-0.171	0.031	0.026	0.187	0.08	0.116
	(0.156)	(0.115)	(0.138)	(0.001)	(0.001)	(0.002)
college	0.283	0.225	0.168	0.434	0.249	0.289
	(0.136)	(0.113)	(0.128)	(0.001)	(0.002)	(0.002)
advanced degree	0.382	0.44	0.368	0.706	0.459	0.525
	(0.127)	(0.111)	(0.137)	(0.002)	(0.002)	(0.002)
white	0.017	0.144	0.114	0.016	-0.045	0.023
	(0.113)	(0.11)	(0.105)	(0.001)	(0.001)	(0.001)
service	-0.71	-0.486	-0.626	-0.55	-0.828	-0.813
	(0.295)	(0.131)	(0.122)	(0.002)	(0.002)	(0.002)
sales	-0.03	-0.213	-0.278	-0.118	-0.332	-0.35
	(0.154)	(0.099)	(0.093)	(0.001)	(0.001)	(0.001)
farming		-1.216	-0.827	-1.07	-1.121	-1.477
		(0.148)	(0.659)	(0.022)	(0.02)	(0.016)
construction	-0.105	0.23	-0.615	0.053	-0.194	-0.168
	(0.207)	(0.125)	(0.41)	(0.009)	(0.008)	(0.009)
production	-0.371	-0.377	-0.444	-0.267	-0.541	-0.485
	(0.317)	(0.15)	(0.187)	(0.003)	(0.003)	(0.003)
military			-0.357	0.633	0.172	-0.757
			(0.232)	(0.038)	(0.048)	(0.028)

Table A-5: OLS Regression Results of Gay Men (Bootstrapped) and Heterosexual Women in AL

	Gay Men			Heterosexual Men		
	2001-2005	2006-2010	2011-2015	2001-2005	2006-2010	2011-2015
intercept	6.466	6.518	9.063	7.405	7.566	7.400
	(1.241)	(0.903)	(1.047)	(0.007)	(0.007)	(0.008)
age	0.116	0.165	0.065	0.099	0.103	0.108
	(0.058)	(0.044)	(0.054)	(0.000)	(0.001)	(0.002)
age squared	-0.001	-0.002	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.002)
married			-0.069	0.335	0.234	0.221
			(0.194)	(0.002)	(0.002)	(0.002)
Some college	0.368	-0.093	0.039	0.204	0.181	0.207
	(0.228)	(0.157)	(0.235)	(0.001)	(0.001)	(0.001)
college	0.717	0.038	0.321	0.521	0.396	0.446

	(0.304)	(0.257)	(0.293)	(0.001)	(0.002)	(0.002)
advanced degree	0.744	0.063	0.106	0.652	0.548	0.550
	(0.338)	(0.234)	(0.321)	(0.002)	(0.002)	(0.002)
white	0.975	0.207	-0.334	0.230	0.240	0.208
	(0.447)	(0.188)	(0.163)	(0.001)	(0.001)	(0.001)
service	-0.318	-0.803	-1.235	-0.310	-0.486	-0.537
	(0.338)	(0.264)	(0.347)	(0.002)	(0.002)	(0.002)
sales	-0.260	-0.236	-0.321	-0.077	-0.220	-0.286
	(0.254)	(0.191)	(0.183)	(0.002)	(0.002)	(0.002)
farming	0.549			-0.316	-0.532	-0.472
	(0.509)			(0.007)	(0.006)	(0.007)
construction	0.274	0.080	-0.150	-0.114	-0.252	-0.249
	(0.257)	(0.29)	(0.292)	(0.002)	(0.002)	(0.002)
production	-0.171	-0.368	-0.653	-0.075	-0.264	-0.240
	(0.432)	(0.216)	(0.295)	(0.001)	(0.002)	(0.002)
military		0.867		0.207	-0.014	0.056
		(0.177)		(0.009)	(0.006)	(0.007)

Table A-6: OLS Regression Results of Lesbians (Bootstrapped) and Heterosexual Women in AL

	Lesbian Women			Heterosexual Women		
	2001-2005	2006-2010	2011-2015	2001-2005	2006-2010	2011-2015
intercept	6.89	6.598	7.574	6.995	7.439	7.68
	(1.381)	(0.765)	(1.053)	(0.009)	(0.009)	(0.01)
age	0.126	0.113	0.089	0.099	0.097	0.085
	(0.063)	(0.035)	(0.05)	(0.000)	(0.000)	(0.000)
age squared	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
married				-0.054	0.126	0.012	0.012
				(0.166)	(0.003)	(0.003)	(0.003)
Some college	0.694	0.473	0.409	0.271	0.167	0.165
	(0.246)	(0.122)	(0.176)	(0.002)	(0.002)	(0.002)
college	1.275	0.738	0.622	0.622	0.386	0.348
	(0.326)	(0.17)	(0.192)	(0.002)	(0.002)	(0.002)
advanced degree	1.475	0.798	0.719	0.777	0.629	0.606
	(0.344)	(0.194)	(0.226)	(0.002)	(0.003)	(0.003)

white	-0.48	0.539	-0.075	-0.021	-0.01	-0.038
	(0.205)	(0.161)	(0.138)	(0.002)	(0.002)	(0.002)
service	-0.279	-0.589	-0.447	-0.553	-0.765	-0.698
	(0.543)	(0.194)	(0.166)	(0.003)	(0.002)	(0.002)
sales	0.035	-0.26	-0.631	-0.051	-0.245	-0.292
	(0.224)	(0.142)	(0.167)	(0.002)	(0.002)	(0.002)
farming				-0.573	-0.559	-0.87
				(0.014)	(0.014)	(0.015)
construction	-0.075	0.206	0.333	-0.022	-0.048	-0.279
	(0.412)	(0.161)	(0.259)	(0.011)	(0.007)	(0.009)
production	0.285	0.007	-0.252	-0.21	-0.343	-0.381
	(0.244)	(0.182)	(0.232)	(0.003)	(0.003)	(0.003)
military		0.419		0.303	0.412	0.46
		(0.108)		(0.024)	(0.022)	(0.028)

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