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Convergence Over Time or Not? U.S. Wages by Sexual Orientation, 2001-2018

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ABSTRACT

Convergence Over Time or Not? U.S. Wages by Sexual Orientation, 2001-2018*

An extensive literature on labor-market outcomes by sexual orientation finds lower wages for gay men compared to heterosexual men and higher wages for lesbians compared to heterosexual women. Recent work looking over multiple time periods provides suggestive evidence, however, that the wage penalty for gay men is heading toward zero. Using data from the American Community Survey on individuals in couples from the 2001 to 2018, we find that the annual wage/salary penalty for gay men is stable since 2008. Although the annual wage/salary premium for lesbians declines slightly, convergence to heterosexual female earnings at the current rate would not occur for at least 15 years. The persistence of a wage penalty for gay men in the face of anti-discrimination policies and rising overall tolerance by Americans is concerning.

JEL Classification: D10, J10, J12, J70

Keywords: wages, employment, sexual orientation, discrimination

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Introduction

Starting with Badgett (1995), a sizable literature examines differences in labor-market outcomes by sexual orientation. Until recently, the results from this literature have been quite consistent: lesbians earn more than heterosexual women, and gay men earn less than heterosexual men, all else equal (Klawitter, 2015; and others).[1]

Yet society has changed dramatically since the 1990s. Same-sex marriage is legal in the United States and elsewhere. Public opinion polls show more tolerant attitudes toward same-sex marriage and sexual orientation more generally. The former Taoiseach, or prime minister, of Ireland is openly gay, as was one of the 2020 candidates for the President of the U.S.

Given these societal changes, could the gap in wages and earnings by sexual orientation be diminishing? Klawitter's (2015) meta-analysis finds that the gap is smaller in recent studies compared to earlier studies. Carpenter and Eppink (2017) find an earnings premium for gay men in the 2013 to 2015 National Health Interview Survey, and they also find an earnings premium for lesbians during this time period. Clarke and Sevak (2013) find a shrinking gap in earnings for gay men relative to heterosexual men, although not always statistically significant, using data in the National Health and Nutrition Examination Survey from 1988 to 2007 on men who live alone. Similarly, the earnings disadvantage for gay men is diminishing in Canada (Dilmaghani 2017; Mueller 2014). For comparison, there is no evidence of a gay earnings disadvantage in recent work in the UK (Aksoy, Carpenter, and Frank, 2019). For women, Cushing-Daniels and Yeung (2009) find a declining lesbian earnings premium in the General Social Survey between 1988 to 2006, which is consistent with the UK evidence in Aksoy, Carpenter, and Frank (2019) of no earnings differences between lesbians and heterosexual women.

[1] Klawitter (2015) and Valfort (2017) summarize the literature on earnings by sexual orientation.

We contribute to this literature by taking a deep dive into earnings and employment by sexual orientation. First, we calculate the wage and earnings gap over a long time period of 2001 to 2018, complementing recent research looking at 1988 to 2007 (Clarke and Sevak, 2013) and 2013 to 2015 (Carpenter and Eppink, 2017). Using the U.S. American Community Survey (ACS), we have a large sample of gay men and lesbians, with over 4,000 individuals of each sexual orientation each year starting in 2005. Of course, the ACS is not without its limitations, as discussed in more detail below. The most notable is the restriction of the sample to cohabiting individuals. Second, we create four measures of earnings, including annual wages/salaries; earnings, defined as wages/salaries plus self-employment income; annual income, defined as earnings plus unearned income such as dividends; and hourly wages. By analyzing different measures of labor-market outcomes, we study the sensitivity of the results to variations in the measure of labor-market outcomes. Third, we study the sensitivity of the results to various age ranges. We expect labor-market behaviors to be correlated with age, so we control for different times in a person's earnings life.

We find that wages by sexual orientation converge in the period prior to the Global Financial Crisis (GFC) but show limited evidence of convergence since. Specifically, for full-time workers, gay men have lower wages of approximately 12 percent compared to married men, whereas lesbians have higher wages of approximately eight percent compared to married women. These gaps are nearly double if the sample is expanded to include part-time workers in addition to full-time workers. The gap is similar for earnings and income, but it is slightly lower for hourly wages compared to annual wages. The gap is robust to various age ranges, as well as to the use of weights or not.

Data

Data are from the American Community Survey (ACS) Public Use Microdata Sample (PUMS). The ACS is the largest individual-level data set collected annually by the U.S.

Census Bureau. We use data from the 2001 to the 2018 surveys, as the surveys prior to 2001 are much smaller and have fewer than 1,000 same-sex couples per year.

Sexual orientation is identified through the ACS question on relationship to head of household. Thus, we can only identify the sexual orientation of individuals who are cohabiting, either as head of household or as the cohabiting partner/spouse. Until 2013, all same-sex couples were identified as unmarried even if they listed their marital status as married. Therefore, to provide consistent analysis across years, we do not distinguish between unmarried and married same-sex couples. Consequently, our sample of cohabiting individuals is divided into four mutually exclusive and exhaustive couple types: gay men, lesbians, unmarried different-sex couples, and married different-sex couples. For ease of discussion, we refer to unmarried different-sex couples as cohabiting couples and married different-sex couples as married.

The sample is restricted to provide consistent comparisons to previous research. Because the focus is on labor-market outcomes, we only include individuals between the ages of 18 and 64 who have positive wage/salary income. We exclude individuals where either member of the couple (head or partner/spouse) has missing values for sex or relationship to head of household. This restriction reduces the likelihood that we misclassify a different-sex couple as a same-sex couple (Black, Sanders, and Taylor, 2006).

The 2001 to 2004 waves of ACS are pilot waves, with approximately 1.1 to 1.2 million observations per year. In 2005, the number of people surveyed increased to nearly 2.9 million individuals.[2] Since then, the sample size has gradually increased; in 2018, there were roughly 3.2 million individuals. Appendix Table 1 shows the sample size of individuals between ages 18 to 64 (with no allocated values as mentioned above) in each of the four

[2] Starting in 2005, ACS data contain a geographical identifier called Public Use Microdata Areas (PUMA), which identify areas of at least 100,000 people. We link these PUMAs to aggregate data reporting the percent urban in each PUMA and define a PUMA as urban if over 50 percent of PUMA residents live in urban areas.

couple types. There are a few noticeable departures in the trends for the final sample relative to the raw number of individuals sampled. The number of individuals in same-sex couples dropped between 25 to 35 percent between 2007 and 2008, despite a slight increase in the number of participants in the ACS. This decline is attributed to two changes in the ACS: a formatting change in the questionnaire making it more difficult for participants to mark both male and female genders accidently and "technological improvements in data collection by interviewers and efforts to make the processing and editing more consistent between data in the ACS and the 2010 Census" (U.S. Census Bureau, 2013, page 2).

Starting in 2013, the number of individuals in same-sex couples began to grow substantially. In 2018, the employment regression sample contained 8,394 gay men and 8,462 lesbians. The number of married individuals dropped slightly in 2008 and continued to drop until 2015. Modeling the determinants of the decision to cohabitate is beyond the scope of this paper, but it is important to keep in mind these changes in the number of cohabiting individuals in the ACS.

Descriptive Statistics

Before exploring differences in earnings by couple type, we first document trends in demographic characteristics for each couple type over the time period 2001 to 2018. Figure 1 shows the trend in age by couple type.[3] The top panel is for women, and the bottom panel is for men. For all years, the ranking of average age is similar by gender: married individuals are slightly older than gay men / lesbians, and cohabiting women / men are noticeably younger. There is a general trend of increasing age over the time period. Note that the trend is noisier for gay men and lesbians, likely due to the much smaller sample sizes.

[3] For all the descriptive statistics, the sample is limited to couples who are the head of household or the partner of the head of household, ages 18 to 64. If either the head or partner has allocated values for sex or relationship to head of household, both the head and the partner are dropped from the sample. In contrast, the regression sample is limited to individuals with non-allocated values of labor-market outcomes, and the wage / earnings / income regressions are limited to people with positive values of wages /earnings / income.

INSERT FIGURE 1 AROUND HERE.

Next, we explore patterns in self-reported race and ethnicity. The race and ethnicity category in the ACS is a 'check all that apply' outcome, so that individuals may report more than one race or ethnicity. Figure 2 contains trends in the percent of individuals identifying as white.[4] The couple type with the highest percentage white is gay males / lesbians, followed by married, and then cohabiting. The differences by couple time have narrowed from over five percentage points in 2001 to around three percentage points in 2017. The percentage white is roughly flat for cohabiting men and women, whereas it is declining for individuals in the other two couple types. For all couple types, over 80 percent of individuals self-identify as white. Appendix Figures 1a and 1b illustrate the trends in the percentage black, Hispanic, and other race separately by couple type for women and men, respectively. The percentage black is constant if not falling over the time period, in contrast to an increase in percentage Hispanic and, for most figures, percentage other race.

INSERT FIGURE 2 HERE.

An important determinant of wages and earnings is education. Figure 3 illustrates the percentage of individuals with a bachelor's degree or graduate degree between 2001 and 2018. Although the percentage for lesbians is roughly constant at approximately 50 percent since 2008, the percentage with college degrees is rising for all other groups over the time period. Lesbians and gay men have the highest levels of education, between 40 and 60 percent. About 30 percent of married women have college degrees in 2001, increasing to 42 percent by 2018. For married men, the percentage increases from 32 percent in 2001 to 39 percent in 2018. Cohabiting women and men have the lowest percentages, with values of less

[4] Like many U.S. studies, the ACS reports Hispanic ethnicity separately from the race categories, in that individuals are simply asked whether or not they identify as Hispanic. Thus, each Hispanic person will also choose from at least one of three racial categories of black, white, and other.

than 20 percent in 2001. By 2018, the percentages have increased to 31 percent for women and 24 percent for men.

INSERT FIGURE 3 HERE

In Figure 4 we look at the percentage of individuals with children in the household. Because the ACS often does not link children with their parents within the household file, the measure of children is simply a dummy variable for the presence of children under age 18 in the household. As the individual is either the head of household or the partner / spouse of the head of household, the likelihood is high that the individual is the parent or guardian. Unfortunately, there is no way to identify paternity or maternity more precisely. [5]

INSERT FIGURE 4 HERE

Figure 4 illustrates a slight downward trend in the presence of children in the household. For gay men and lesbians, there is a noticeable drop in the likelihood of children in the household in 2008. This drop occurs at the same time as a noticeable drop in the number of gay men and lesbians in the data. As mentioned earlier, the ACS made multiple changes at that time to reduce the likelihood of misclassifying couples, particularly same-sex couples. This dramatic drop in children in the household, coupled with higher rates of children in the household among different-sex couples, is consistent with misclassification of same different-sex couples as same-sex couples prior to 2008. Approximately half of married men and women have children in the household, compared to around 40 percent for cohabiting men and women. In contrast, less than 30 percent of lesbians and around 10 percent of gay men have children in the household in 2008 or later.

[5] Specifically, the ACS does not identify maternity directly, and the variable for relationship to head of household only identifies children of the head of household, not the partner / spouse.

Methods

The results in the previous section suggest that, in general, the trends in demographics are roughly similar across couple types and over time, but some clear differences between couple types exist. In this section, we present the econometric specification for estimating labor-market outcomes using ordinary least squares (OLS) regression. We estimate separate models for men and for women,[6] and we estimate separate models for each year.[7] Equation (1) contains the main regression specification for a given year:

$$Ln(Y_i) = \alpha + \beta * \text{Couple type}_i + \gamma * X_i + \varepsilon_i \quad (1)$$

In the preferred specification, Y_i is annual wages for individual i, measured in natural logs. For robustness, we also estimate alternate models where annual earnings, annual income,[8] and hourly wage are the dependent variables, again estimated in natural logs.

For couple type, we include two dummy variables, one for being in an unmarried, different-sex cohabiting couple – referred to as cohabiting for brevity, and one for being in a same-sex couple. Because the omitted couple type is different-sex married couples – referred to as married for brevity, the coefficients for couple type are interpreted relative to married individuals. As mentioned previously, for most years the ACS does not distinguish between married and unmarried same-sex couples. For consistency across years, we combined individuals in married and unmarried same-sex couples into a single same-sex couple category.

For each individual, the vector X contains the following observable determinants of log wages: race / ethnicity relative to the omitted category of white; age and age squared; education relative to the omitted category of high school graduates; number of kids in the

[6] The ACS data have two categories for gender, male and female.
[7] The models are estimated separately by year to provide a more flexible model and to reduce computational burden.
[8] As mentioned previously, annual earnings are equal to the sum of (1) wage and salary earnings and (2) self-employment earnings. Income includes earnings and unearned income such as interest payments.

household, with separate variables for school-age children (ages 6 to 17) and for younger children (ages 0 to 5); occupation relative to the omitted category of managerial occupations; industry relative to the omitted category of education, medical, family services, and administration; a dummy variable for disabled; a dummy variable for currently in school; a dummy variable for urban location (2005 and later);[9] and state fixed effects. We assume that heteroskedasticity exists and use Stata's robust command to adjust the standard errors accordingly.

Finally, we also estimate two models of labor supply. In the first, the dependent variable is the usual number of hours worked per week.[10] This model is estimated only on working individuals in order to isolate the variation in labor supply for workers, rather than measuring the combination of employment and hours worked provide an estimate of the intensive margin of labor supply. Second, we estimate a linear probability model on employment. The dependent variable is equal to one for individuals who are employed and zero for all other individuals. In other words, the dependent variable is equal to zero for the unemployed as well as individuals who are not in the labor market. Employment is determined by the ACS created variable called employment status recode.

In all models, in addition to the sample restrictions mentioned in the data section, one further sample restriction exists. Individuals with allocated values for the dependent variable are excluded from the regressions. For example, the employment regression sample excludes individuals with allocated values for the employment status recode variable. Bollinger and Hirsch (2013) document concerns with using imputed observations in the Current Population Survey (CPS), and the ACS uses the same imputation procedure as the CPS.

[9] Specifically, the definition of urban is living in a PUMA that is classified as urban, using data from files from 2000 (for the 2001-2011 ACS data) or 2012 (for the 2012-2018 ACS data) from the Missouri Census Data Center (mcdc.missouri.edu). We are grateful to the Center for making these data available online.

[10] We also estimate a model where hours worked per year is the dependent variable, again for workers. However, in most years, the weeks worked per year is a categorical variable (with 6 categories). Consequently, the measure of hours worked per year is less precisely estimated that the usual hours worked per week.

Results

Figure 5 presents the results from the regressions where the dependent variable is a measure of wages, earnings, or income; the preferred measure is log annual wages and salary. The results are from the subsample of full-time workers, defined as working at least 35 hours a week for at least 27 weeks (i.e. more than half the year) in the last 12 months. The top panel is for women, and each line represents the coefficient for lesbians compared to the omitted group of married (different-sex) women. The bottom panel is for men, and the reported coefficient is for gay men as compared to the omitted group of married (different-sex) men. The coefficients and standard errors are also reported in Table 1.

INSERT FIGURE 5 HERE.

INSERT TABLE 1 HERE.

The pattern of results matches much of the previous literature: a premium for lesbians relative to married women and a penalty for gay males relative to married men. In the early years of the panel, all the coefficients are converging toward zero. However, as noted in by the U.S. Census Bureau (2013), there are concerns that some of gay men and lesbians are misclassified prior to 2008. In 2008, the wage premium for lesbians is 0.108 log points. The wage premium declines to 0.096 in 2009 and stays around that level until declining in 2017 and 2018. In 2018, the lesbian coefficient is 0.078 log points.

The pattern of results holds across all four outcomes. The results are nearly identical for annual earnings. The lesbian premium is slightly higher for annual income, the sum of earnings and unearned income. The log hourly wage premium is between 0.03 and 0.04 log points lower than the annual wage premium between 2008 and 2018. Thus, hours worked may differ by sexual orientation, a point to which we return below.

For gay men, the wage penalty exists in all years, but the magnitude varies substantially. The results across years follow the same pattern across all four outcome

measures: an increasing penalty between 2002 and 2004, followed by a decreasing penalty until 2014, and an increasing penalty through 2017. In 2008, the first year with more reliable data on sexual orientation, the wage penalty is 0.125 log points, compared with a wage penalty of 0.117 log points in 2018. As with lesbians, the gay wage penalty is largest for annual income and smallest for hourly wages.

Appendix Figure 2 contains regression results for the full sample of workers rather than the subsample of full-time workers. The lesbian wage premium and the gay male wage penalty are still present in the full sample and follow the same temporal pattern. For the three annual measures, the penalty and premium are noticeably larger in the full sample. The hourly wage results are quite similar between the full-time sample (Figure 5) and the sample of all workers (Appendix Figure 2), consistent with a similar hourly wage penalty / premium for full-time workers and part-time workers.

The lower wage premium and penalty for full-time workers relative to all workers suggests the possibility of labor-supply differences by sexual orientation. Like earnings, a substantial literature starting with Tebaldi and Elmslie (2006) documents a labor-supply penalty for gay men and a lesbian premium.[11] Therefore, Figure 6 contains the results for two measures of labor supply. The first measure is the usual hours worked per week, and the regression sample is the set of all workers regardless of full-time or part-time status. The second measure is a dummy variable for employment, and the regression sample is all individuals,[12] including individuals not in the labor force. The scale on the left is for hours worked, and the scale on the right is for employment probability. Lesbians work more hours per week and have higher employment probabilities than different-sex married women. Although both the lesbian premium and the gay male penalty converge toward zero prior to

[11] Recent work in the area of sexual orientation and labor supply looks closely at the role of factors such as tolerance (Hansen, Martell, and Roncolato, 2020b) and state and local policies (Delhommer, 2020).
[12] As mentioned above, we exclude individuals with allocated values for employment.

2008, we have previously noted data concerns with this time period. For the period between 2008 and 2018, there is little difference in either the lesbian premium or the gay male penalty. Conditional on working, lesbians work approximately three more hours per week, compared with a mean of 37 hours per week for the 2018 regression sample. In contrast, gay men work approximately two fewer hours per work, compared with a mean of 44 hours worked per week in 2018.

The differences in the extensive margin of employment are larger than the intensive margin of hours worked among workers. The employment premium for lesbians is around nine percentage points, over ten percent of the average employment rate of 70 percent in 2018. The gay penalty in employment is approximately seven percentage points, in comparison to an average employment rate of 87 percent in 2018. Carpenter and Eppink (2017) find a smaller penalty / premium of four to five percentage points.

To investigate the possibility of a time trend in the wage premium and penalty, we run very simple regressions of a yearly time trend on the regression coefficients in Figure 5, limited to the years between 2008 and 2018 due to concerns about data quality for same-sex couples prior to 2008.[13] The results from these regressions are in Table 2. These results provide evidence of convergence among women, as the coefficient for time trend is always statistically significantly different from zero at the five-percent level (for a two-sided test). The decline in the premium varies from 0.0021 log points for annual wages to 0.0036 for annual income. If the wage premia decline at this level from their 2018 levels, the premia would not disappear for at least 15 years. We interpret this finding as suggestive of a lack of *economic* convergence despite back-of-the-envelope evidence of *statistical* convergence. This result is contrast with the downward trend in the lesbian premium found in similar

[13] We run this simple regression rather than a pooled, individual-level regression because the individual-level regression would contain millions of observations and ALL the regression coefficients would be statistically significant from zero. In other words, we would find a statistically significant time trend but perhaps not an economically significant one.

regressions in the meta-analysis by Klawitter (2015). Table 1 provides no evidence of convergence in the gay male penalty, a result that is also at odds with the trends found in other data sets (Carpenter and Eppink, 2017; Clarke and Sevak, 2013) or in a meta-analysis (Klawitter, 2015).

INSERT TABLE 2.

Why would the results for gay men differ for the ACS relative to other data sets? First and foremost, the ACS data only contain gay men and lesbians in cohabiting couples, and these individuals may differ from the broader population of gay men and lesbians. In the NHIS data used by Carpenter and Eppink (2017), 66.1 percent of lesbians are cohabiting, compared with 47.4 percent of gay men. Carpenter and Eppink (2017) and Clarke and Sevak (2013) use individual-level responses on sexual orientation –rather than the approach in the ACS data of inferring sexual orientation from the genders of the head of household and the partner / spouse. Although Carpenter and Eppink (2017) find no evidence of a wage penalty for gay men when they limit the sample to partnered men, the sample of partnered gay men in their regression is 146. The sample of gay men – partnered or not – is only 77 is Clarke and Sevak (2013). Thus, it is difficult to determine in currently available data whether the pattern of results by sexual orientation differs between individuals who are cohabiting versus those who do not live with a partner.

An unlikely explanation the difference in results is variation in the dependent variable to capture labor-market outcomes. The results in Figure 5 illustrate a similarity across different measures of incomes, including the annual earnings measure used in Carpenter and Eppink (2017). Clarke and Sevak (2013) use household earnings, as their data set does not contain individual earnings. Although the results for hourly wages suggest a lower gay male penalty, the pattern of convergence – or lack thereof – is similar when compared to annual wages, earnings, or income.

The age range of the sample also differs across studies of earnings by sexual orientation. Our results are for ages 18 to 64, the same as Blandford (2003) and Carpenter (2004). Other age ranges in the literature include: 25 to 64 in Carpenter and Eppink (2017), 18 to 59 in Clarke and Sevak (2013); 25 to 59 in Antecol, Jong, and Steinberger (2008); 25 to 54 in Antecol and Steinberger (2013); 20 to 64 in Allegreto and Arthur (2001); and 18 to 65 in Jepsen (2007).[14]

Figure 7 contains the results across age ranges for the annual wage regressions; results for annual earnings, annual income, and hourly wages follow the same pattern and are available from the authors upon request. The results are quite similar across the different age ranges for both men and women. For most years, the gay male penalty and the lesbian premium appear to be slightly smaller for prime-age earners, ages 25 to 54. Thus, the different age ranges used across papers is most likely not the explanation for differences in results.

INSERT FIGURE 7

Plug, Webbink, and Martin (2014) show that, in Australia, gays and lesbians avoid certain occupations identified as prejudiced against sexual minorities. In the U.S., Del Río and Alonso-Villar (2019) document occupational segregation for same-sex couples. Therefore, we explore the sensitivity of our results to the exclusion of control variables for industry and occupation. The results from this more parsimonious model are illustrated in Figure 8. The lesbian premium is noticeably lower in the models that exclude controls for occupation and industry. This result is consistent with the comparisons between women in same-sex couples and women in different-sex couples in Del Río and Alonso-Villar (2019). In contrast, Antecol, Jong, and Steinberger (2008) find little role of occupational sorting in

[14] Rather than attempt to cover all the age ranges and all the papers in the vast literature on labor-market outcomes by sexual orientation, this list focuses on studies that either look over time at labor-market outcomes (Carpenter and Eppink, 2017; Clarke and Sevak, 2013) or that use Census or ACS data. Even so, the list is far from exhaustive.

explaining wage differentials in the 2000 Census, where they use Oaxaca-Blinder decompositions. Perhaps the role of occupation has changed over time, as the role of occupation is generally smaller at the start of our period (close to 2000) compared to later years (such as the 2010-2015 time period studied by Del Río and Alonso-Villar (2019)).[15]

INSERT FIGURE 8

For men, the results are nearly identical whether or not the model includes controls for occupation and industry. This result is consistent with Antecol, Jong, and Steinberger (2008). Although Martell (2018) finds similar results between models with and without controls for occupation, he shows that the gay male penalty is smaller in occupations with more independence. Our results for men are at odds with Del Río and Alonso-Villar (2019)), who find that occupational sorting explains a sizeable portion of the gay wage penalty.

Because the regression model contains a dummy variable for individuals in unmarried, different-sex couples, the comparison group is the set of individuals in married, different-sex couples. Appendix Figure 3 shows the results when the comparison group is all – married and unmarried – individuals in different-sex couples. The coefficients for lesbians and gay men are nearly identical to the coefficients in Figure 5, showing that the results are not sensitive to the inclusion or exclusion of unmarried individuals in different-sex couples in the comparison group.

The next robustness test is to compare the results from different samples. Figure 9 illustrates the results from three different samples. The first is the preferred sample used throughout the paper. The second sample is limited to whites only, in order to isolate the effects of sexual orientation from the effects of race / ethnicity. The third sample is limited to

[15] Delohommer (2020) finds that the gay male penalty and the lesbian premium are smaller in models that include occupation fixed effects. Because the paper contains interaction terms between state and local anti-discrimination laws and sexual orientation (as well as county fixed effects), it is difficult to provide a direct comparison between his results and ours.

individuals who live in households without any children ages 0 to 17. Because the pattern of results is similar for all wage measures, the Figure focuses on the results for annual wages.[16]

For women, the pattern of results between 2008 and 2018, the time period with the most accurate data, is similar across the four samples. Starting in 2013, the premium is slightly lower when the sample is limited to white women. Such a result is inconsistent with the notion that lesbians of color face a double-disadvantage for both the color of their skin and their sexual orientation. The similarity of results between the preferred sample and the sample without kids in the household suggests that differences by sexual orientation in the presence of children in the household is not driving the premium. However, the controls for children in the ACS data are imprecise, so future work with better data on parenthood is needed.

In contrast, the gay male penalty varies with the sample used. Compared to the full sample, the gay penalty is larger for the sample of whites. As with lesbians, this result is not consistent with a story of gay men of color facing a double-disadvantage due to skin color and sexual orientation. The gay male penalty is smaller when we restrict the sample to men in households without children. Such a finding is consistent with the notion of a married father premium rather than simply a marriage premium as is well documented in the literature (de Linde and Stanley, 2015).

Another factor to consider is whether to estimate weighted or unweighted regressions. Given the large amount of likely non-random allocated values for labor-market outcomes, our preferred model is unweighted. The results for weighted regressions are in Appendix Figure 4, using the svy command in Stata for person-level weights. Aside from slightly smaller

[16] For brevity, the figure does not include two additional samples whose results are nearly identical to the full sample. One sample excludes individuals in the fishing, forestry, and farming industries, where almost no gay men and lesbians are employed. The other sample excludes individuals who have allocated values of marital status. We include such individuals in the preferred sample because we do not distinguish between individuals in married and unmarried same-sex couples. However, a potential concern is that individuals with allocated values of marital status have mis-allocated values of sexual orientation.

lesbian premia and gay male penalty, the results are quite similar between the two sets of regressions.

Martell (2020) shows that the lesbian wage premium can be explained by differences in the return to experience. When he includes interaction terms between sexual orientation and potential experience, the coefficient for lesbian is negative. However, given the positive interaction term between lesbian and potential experience, the wages of lesbians are higher than those of married women for individuals with approximately 10 years of experience or more. We can replicate this pattern in our data throughout the time period, as expected given that Martell (2020) also uses ACS data.

Finally, changes in state and local policies and attitudes could also contribute to changes over time in labor-market differentials by sexual orientation. Several studies focus on state-level anti-discrimination laws (Klawitter and Flatt, 1998; Gates, 2009; Martell, 2013; Martell, 2014; Burn, 2018), and Delhommer (2020) also looks at local laws. Sansone (2019) and Hansen, Martell, and Roncolato (2020a) study same-sex marriage laws, and Burn (2020) and Hansen, Martell, and Roncolato (2020b) explore state-level measures of tolerance. Our preferred model accounts for such state-level changes through the use of state fixed effects and separate regressions by year, but this method cannot directly measure the impact of these changes on labor-market outcomes.

Conclusion

Using 2001 to 2018 ACS data on cohabiting individuals, we find that the gap in wages by sexual orientation narrows between 2001 and 2008. After that, the gap remains relatively flat for gay men at around 11 percent for annual wages, earnings, and income. The lesbian premium declines slightly in later years, with a gap of around eight percent in 2018. However, the rate of decline is so slow that converge in wages would not be reached for 15 years, if not more, if the current trend in convergence continues.

This stalled convergence for wages is in contrast to recent work suggesting that the convergence is either continuing (Canada: Dilmaghani ,2017; Mueller, 2014) or is already converged (the UK: Aksoy, Carpenter, and Frank, 2018), or that gay men actually earn more than heterosexual men in the U.S. National Health Interview Survey (Carpenter and Eppink, 2017). Aksoy, Carpenter, and Frank (2018) document a difference by cohabitation in the UK – the trends in earnings for cohabiting couples in their data match our results, whereas earnings are similar by sexual orientation when the sample includes individuals who are not cohabiting.

Better understanding why this discrepancy in earnings by sexual orientation exists across living arrangements is not possible with current data. The National Health Insurance Survey, with roughly 35,000 respondents per year, is the largest data set with detailed information on sexual orientation and labor-market outcomes, but the sample sizes for subgroups of gay men and lesbians are quite small. Many of the subgroup analyses in Carpenter and Eppink (2017) produced statistically insignificant effects due to small sample sizes. Thus, we echo their demand for the inclusion of sexual orientation information in large data sets such as the ACS.

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Figure 1a: Average Age by Couple Type, Women

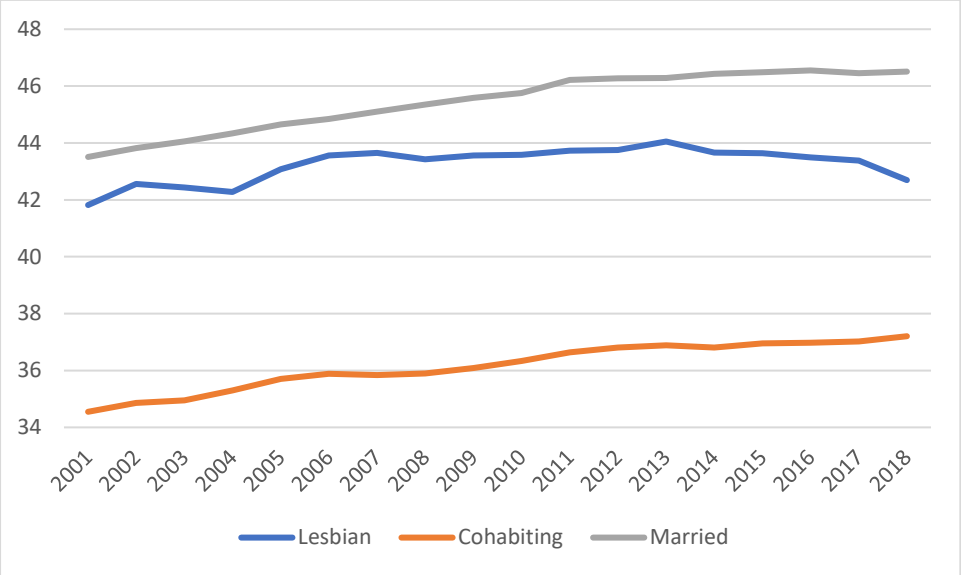


Figure 1b: Average Age by Couple Type, Men

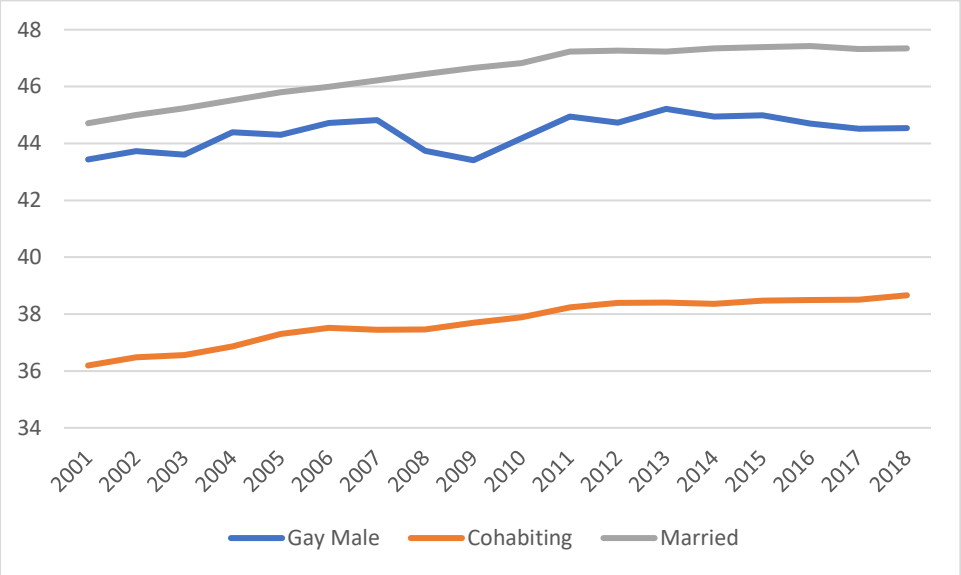


Figure 2a: Percent White by Couple Type, Women

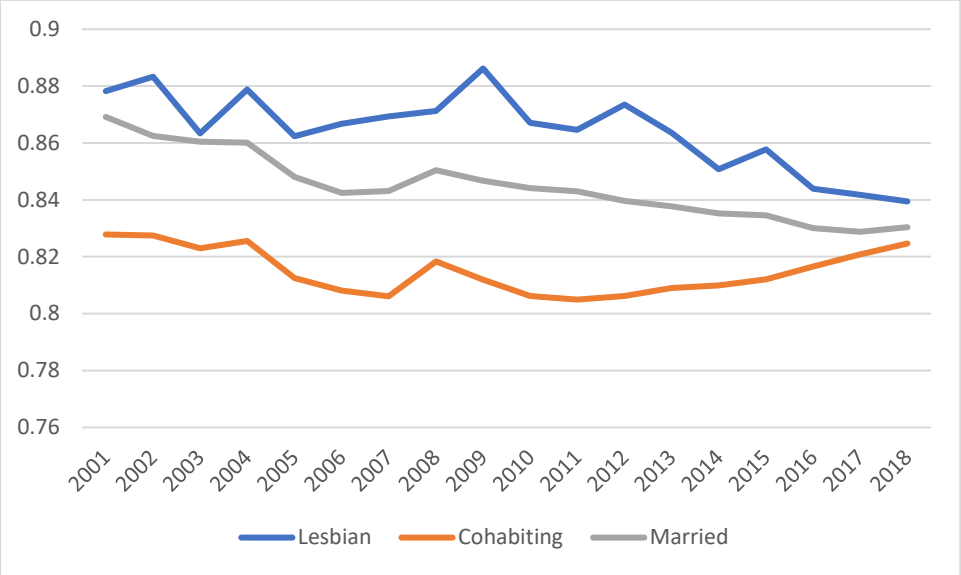


Figure 2b: Percent White by Couple Type, Men

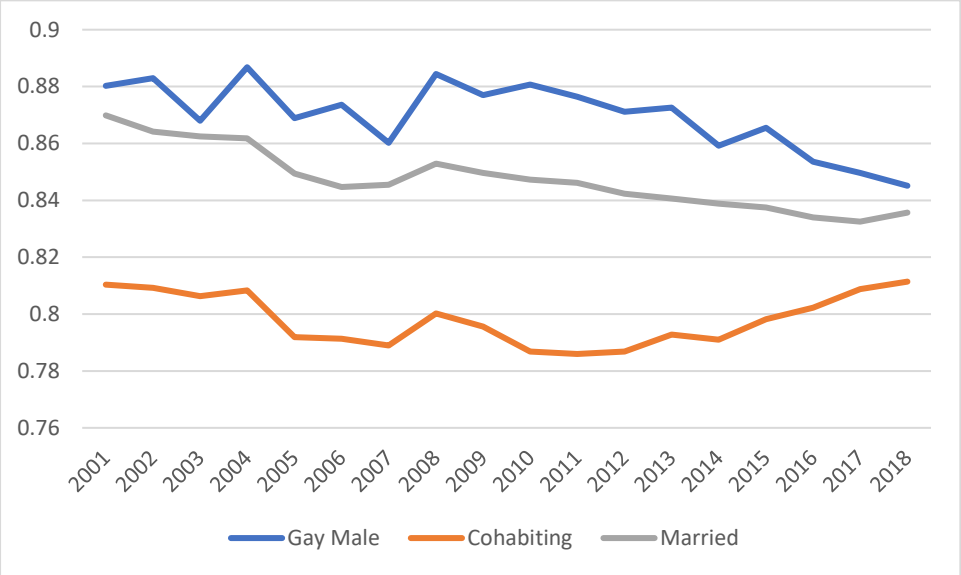


Figure 3a: Percent Bachelor's Degree or Higher by Couple Type, Women

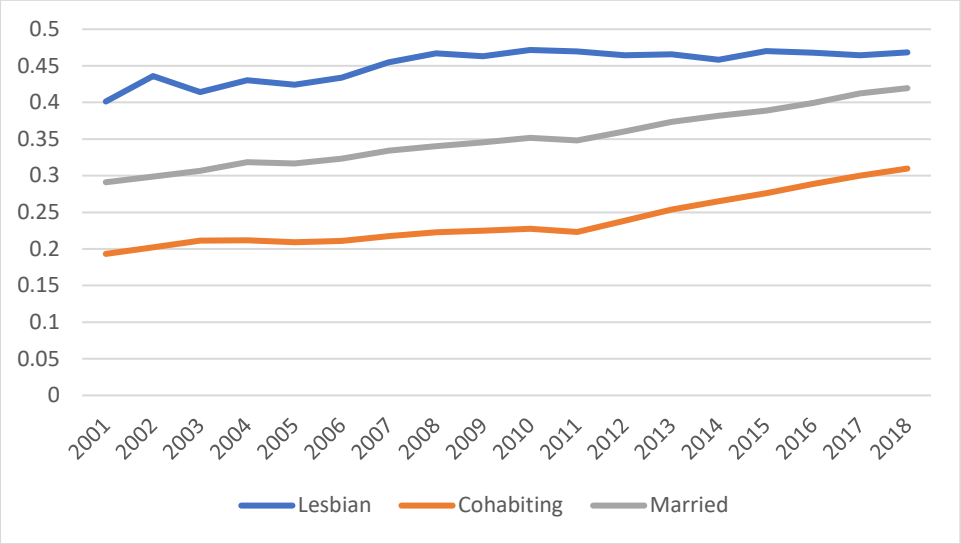


Figure 3b: Percent Bachelor's Degree or Higher by Couple Type, Men

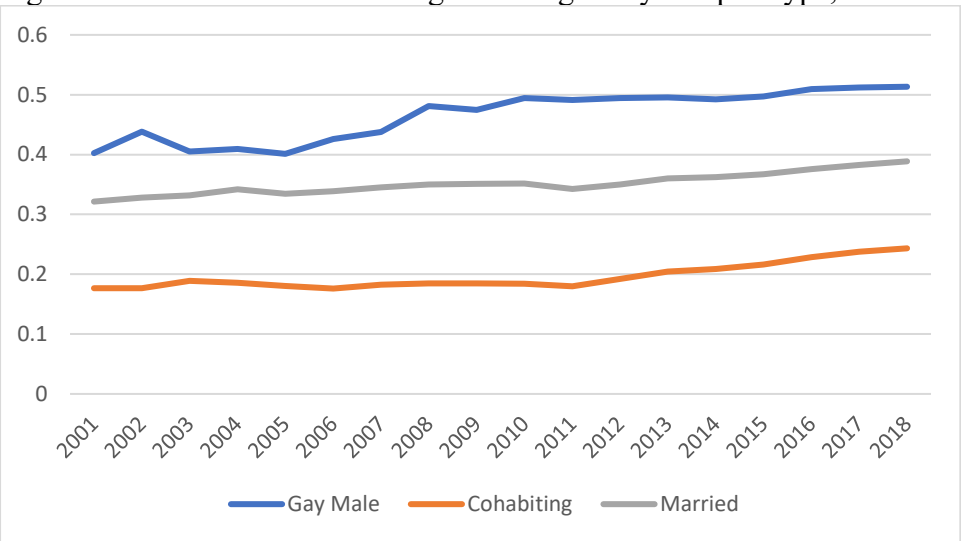


Figure 4a: Percentage of Households with Kids by Couple Type, Women

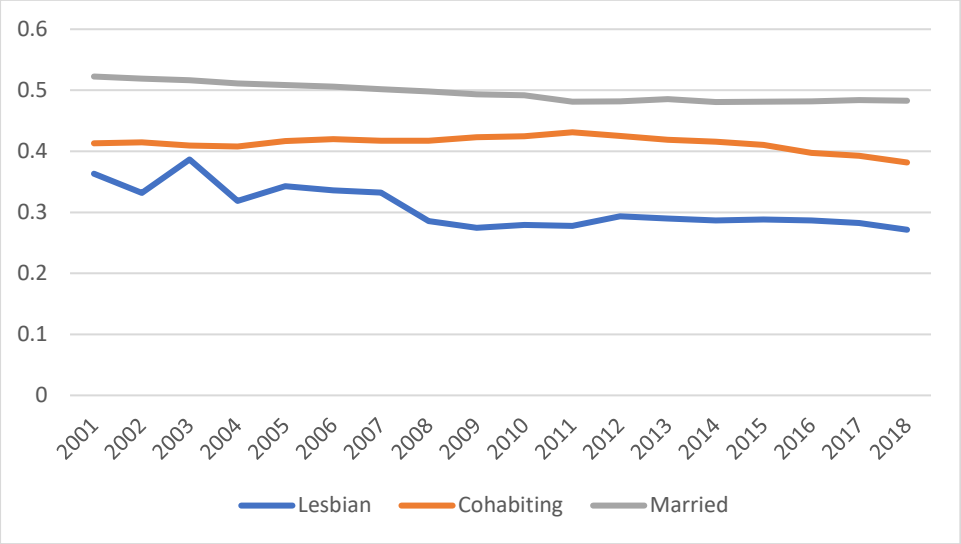


Figure 4b: Percentage of Households with Kids by Couple Type, Men

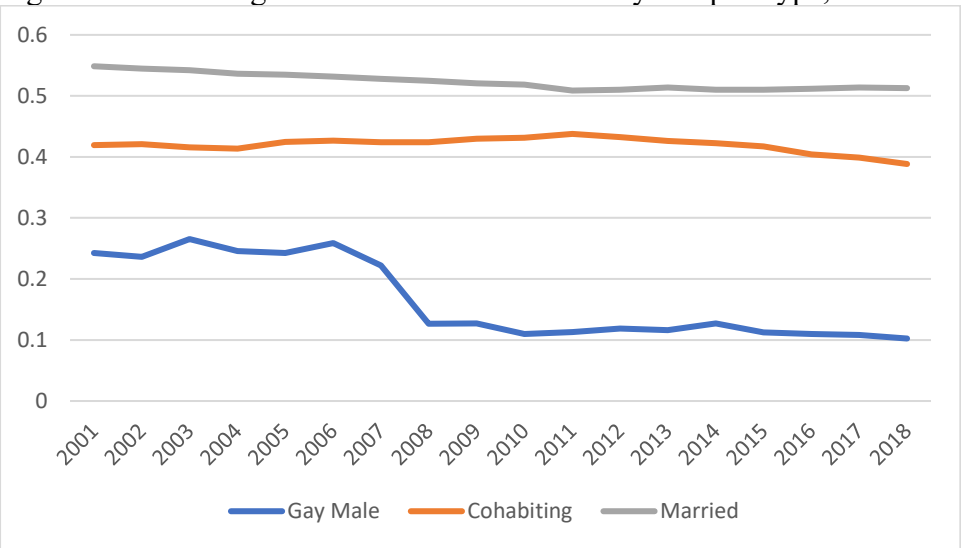


Figure 5a: 2001-2018 ACS Coefficients for Lesbian

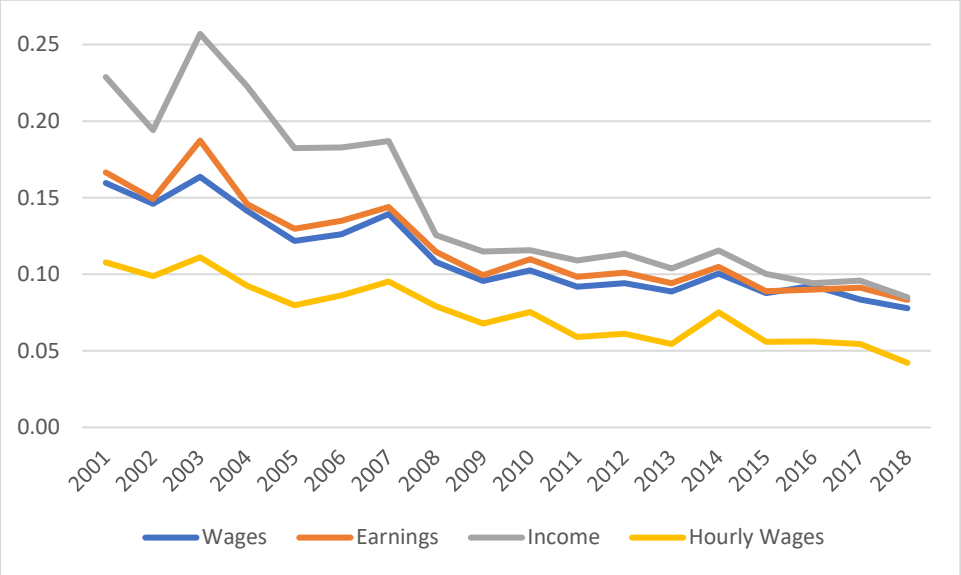


Figure 5b: 2001-2018 ACS Coefficients for Gay Men

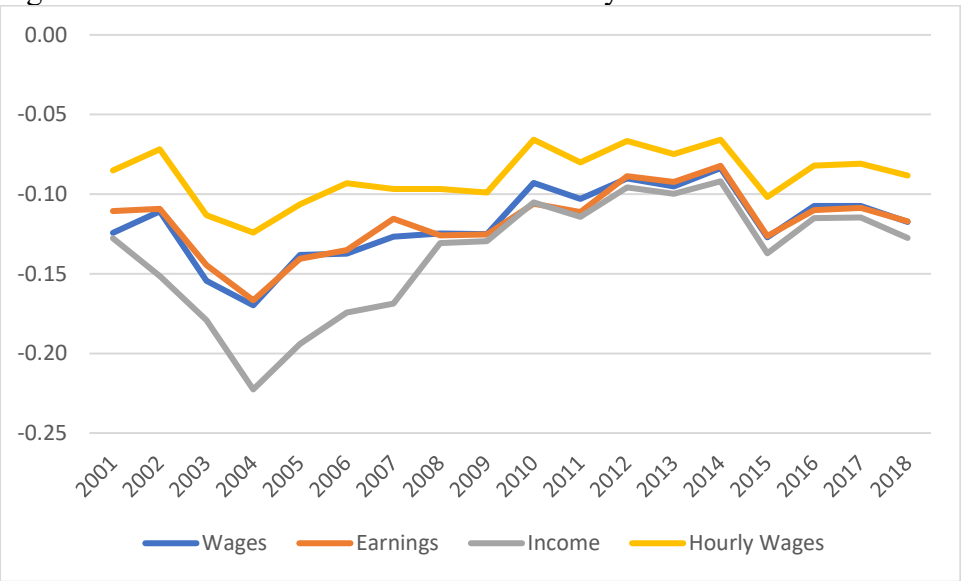


Figure 6a: 2001-2018 Coefficients for Lesbians, Hours Worked and Employment

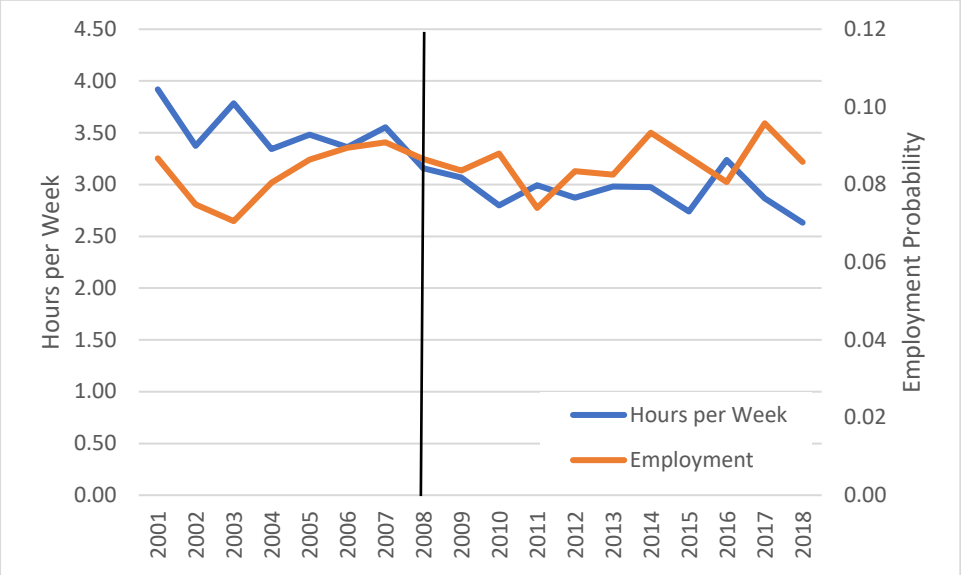


Figure 6b: 2001-2018 Coefficients for Gay Men, Hours Worked and Employment

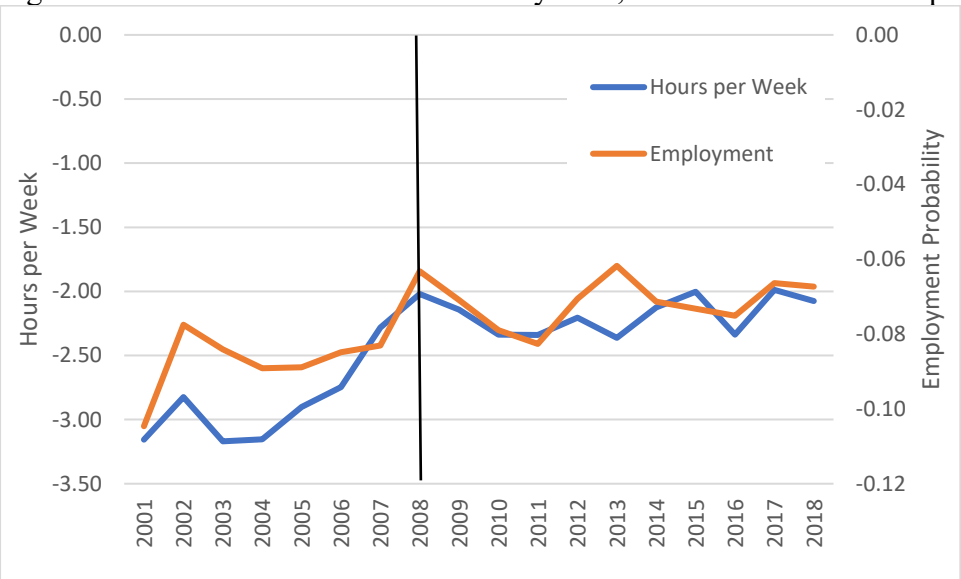


Figure 7a: Robustness of Lesbian Coefficient to Different Age Ranges, Annual Wages

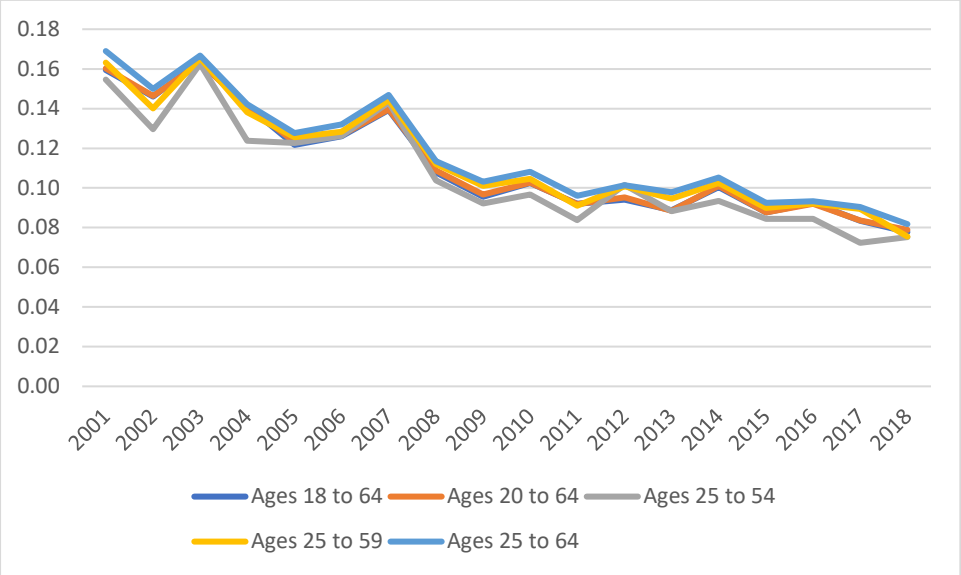


Figure 7b: Robustness of Gay Male Coefficient to Different Age Ranges, Annual Wages

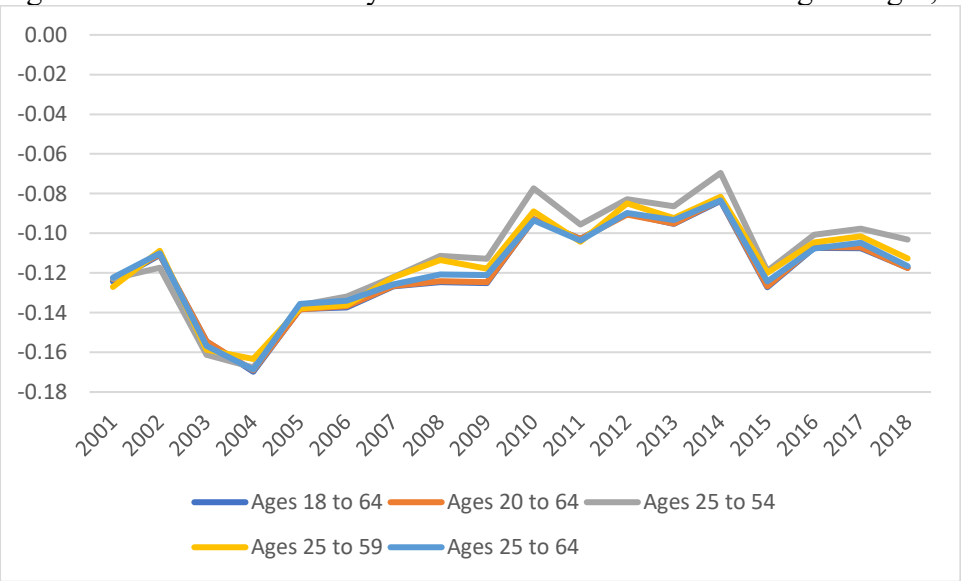


Figure 8a: 2001-2018 ACS Coefficients for Lesbian
Excluding Industry and Occupation Controls

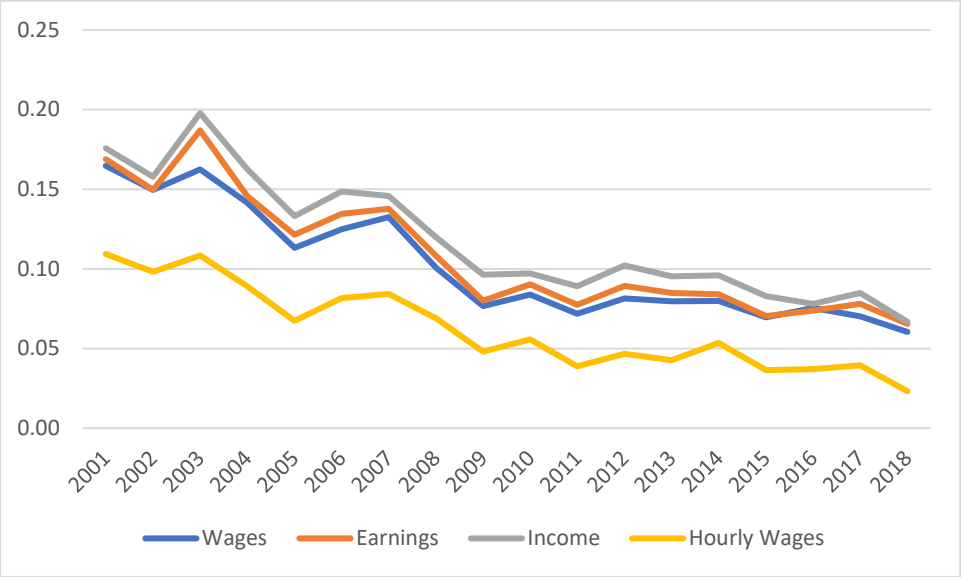


Figure 8b: 2001-2018 ACS Coefficients for Gay Male
Excluding Industry and Occupation Controls

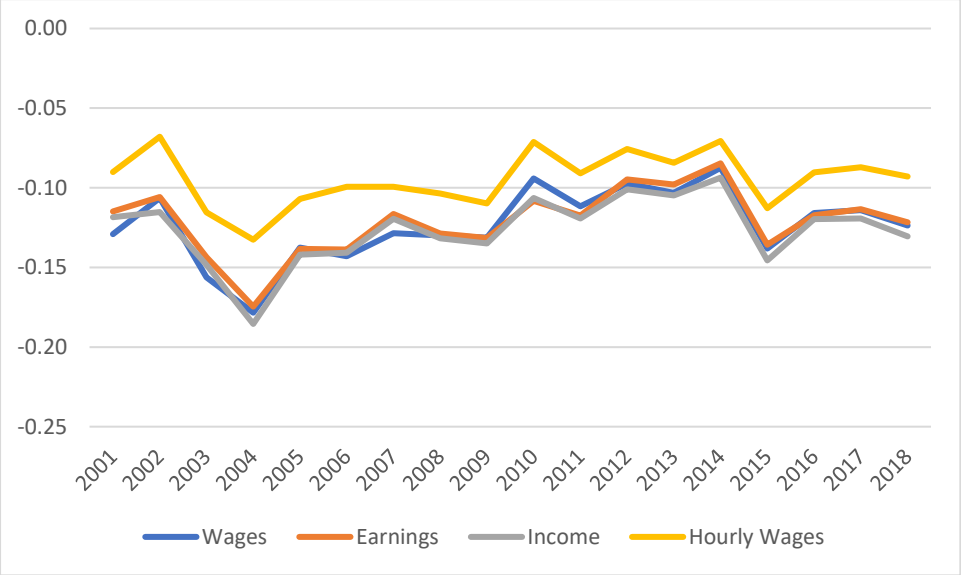


Figure 9a: 2001-2018 ACS Coefficients for Lesbians, Different Samples

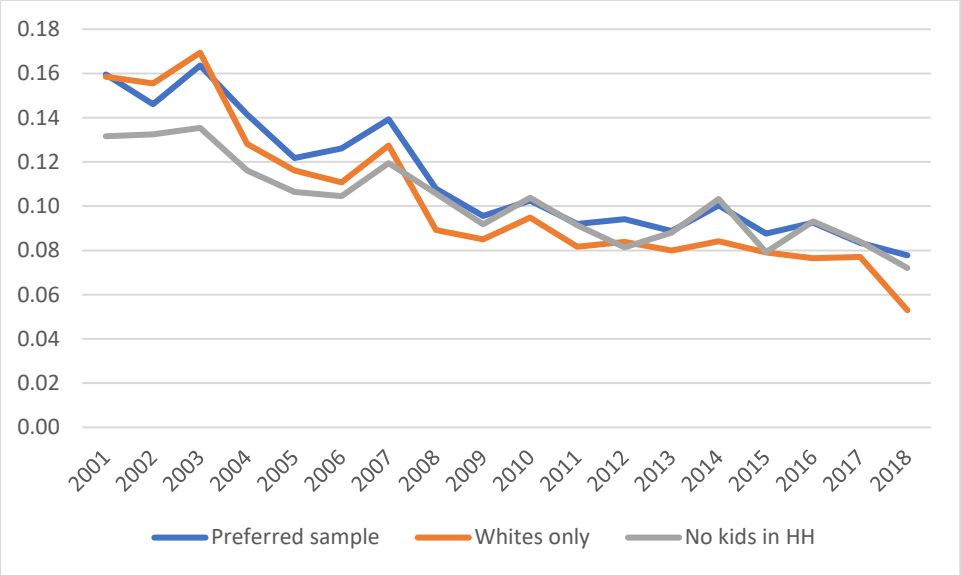


Figure 9b: 2001-2018 ACS Coefficients for Gay Male, Different Samples

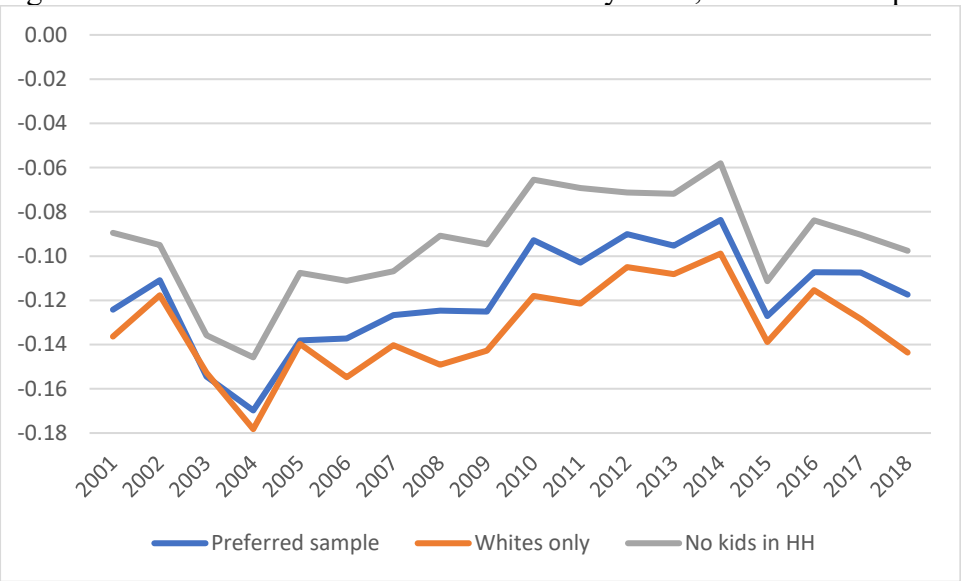


Table 1: Gay Male Coefficients for Log Annual Wages, 2001-2018 ACS

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Gay Male	-0.124	-0.111	-0.154	-0.170	-0.138	-0.137	-0.127	-0.125	-0.125
	(0.014)	(0.016)	(0.015)	(0.015)	(0.009)	(0.009)	(0.010)	(0.011)	(0.011)
Different-sex	-0.141	-0.135	-0.150	-0.140	-0.141	-0.142	-0.137	-0.143	-0.151
Unmarried	(0.006)	(0.006)	(0.006)	(0.006)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Observations	161,179	148,049	161,997	164,916	355,027	355,786	357,451	358,362	346,427
R-Squared	0.281	0.267	0.265	0.273	0.331	0.334	0.340	0.339	0.341

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Gay Male	-0.093	-0.103	-0.090	-0.095	-0.084	-0.127	-0.107	-0.107	-0.117
	(0.011)	(0.011)	(0.011)	(0.010)	(0.011)	(0.010)	(0.010)	(0.010)	(0.009)
Different-sex	-0.145	-0.144	-0.142	-0.141	-0.137	-0.134	-0.136	-0.134	-0.135
Unmarried	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Observations	322,633	311,465	318,875	318,084	316,395	321,104	323,762	330,223	332,434
R-Squared	0.351	0.355	0.353	0.347	0.347	0.346	0.345	0.340	0.339

Notes: Separate regressions are estimated for each year. In addition to the coefficients listed, all models contain additional control variables as outlined in the methods section. All coefficients are statistically significantly different from zero at the one percent level for a two-sided test. Standard errors are robust to heteroskedasticity.

Table 2: Lesbian Coefficients for Log Annual Wages, 2001-2018 ACS

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Lesbian	0.160	0.146	0.164	0.141	0.122	0.126	0.139	0.108	0.096
	(0.014)	(0.016)	(0.016)	(0.014)	(0.009)	(0.009)	(0.009)	(0.010)	(0.010)
Different-sex	0.000	-0.019	-0.019	-0.013	-0.021	-0.023	-0.028	-0.029	-0.026
Unmarried	(0.006)	(0.006)	(0.006)	(0.006)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Observations	100,035	91,066	99,179	101,318	241,612	244,258	246,797	251,635	247,683
R-Squared	0.344	0.341	0.340	0.335	0.351	0.354	0.360	0.363	0.367

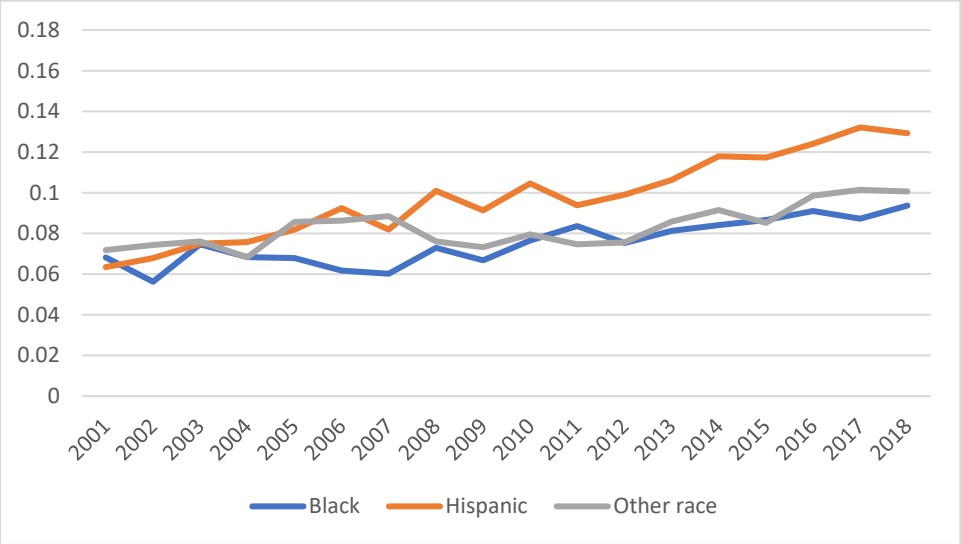
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Lesbian	0.102	0.092	0.094	0.089	0.100	0.088	0.092	0.083	0.078
	(0.010)	(0.010)	(0.010)	(0.009)	(0.009)	(0.009)	(0.008)	(0.009)	(0.008)
Different-sex	-0.031	-0.022	-0.033	-0.027	-0.026	-0.032	-0.028	-0.023	-0.023
Unmarried	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Observations	234,831	225,712	229,464	229,473	228,100	233,394	236,546	242,947	245,927
R-Squared	0.369	0.372	0.372	0.362	0.366	0.364	0.364	0.359	0.359

Notes: Separate regressions are estimated for each year. In addition to the coefficients listed, all models contain additional control variables as outlined in the methods section. All coefficients are statistically significantly different from zero at the one percent level for a two-sided test. Standard errors are robust to heteroskedasticity.

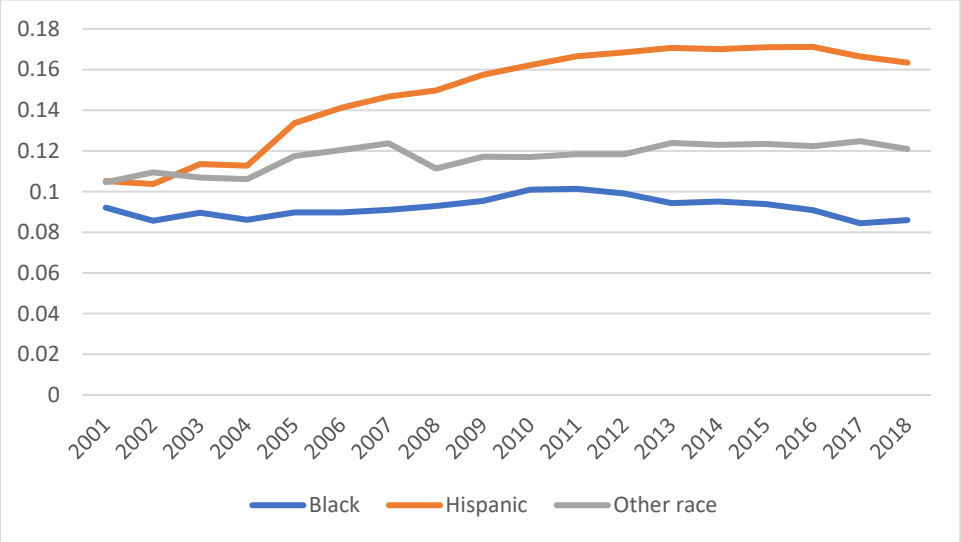
Table 2 – Coefficient on Time Trend for Lesbian and Gay Male Coefficients,2008-2018

	Annual Wages	Annual Earnings	Annual Income	Hourly Wages
Lesbian				
Coefficient	-0.0017	-0.0020	-0.0028	-0.0018
Standard Error	0.0008	0.0007	0.0007	0.0008
T-stat	-2.117	-2.910	-4.314	-2.328
Observations	11	11	11	11
R-squared	0.33	0.48	0.67	0.38
Gay Men				
Coefficient	-0.00004	0.00037	-0.00009	0.00013
Standard Error	0.0014	0.0014	0.0014	0.0013
T-stat	-0.026	0.261	-0.063	0.097
Observations	11	11	11	11
R-squared	0.00	0.01	<0.01	<0.01

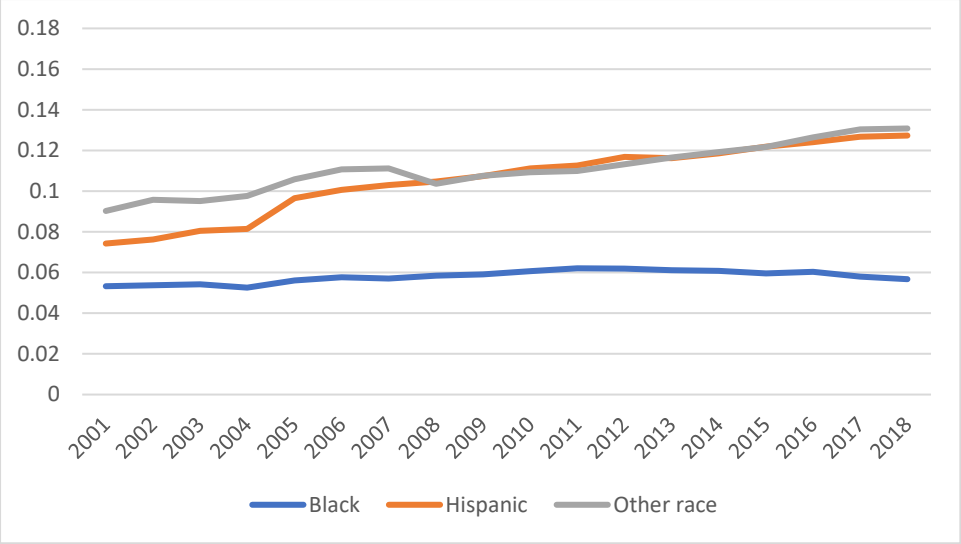
Appendix Figure 1a: Percentage Race / Ethnicity Trends by Couple Type, Women
Lesbians



Different-sex Unmarried Cohabiting Women

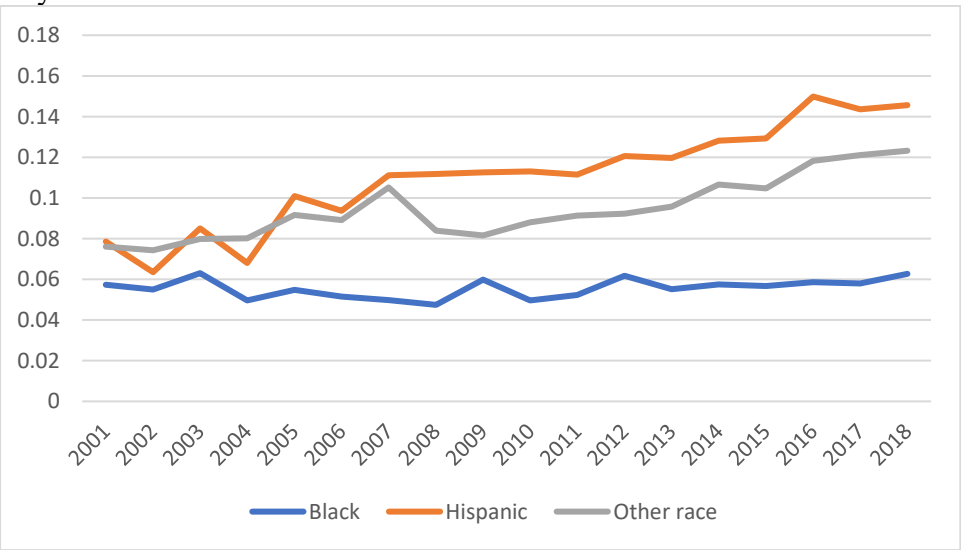


Different-sex Married Women

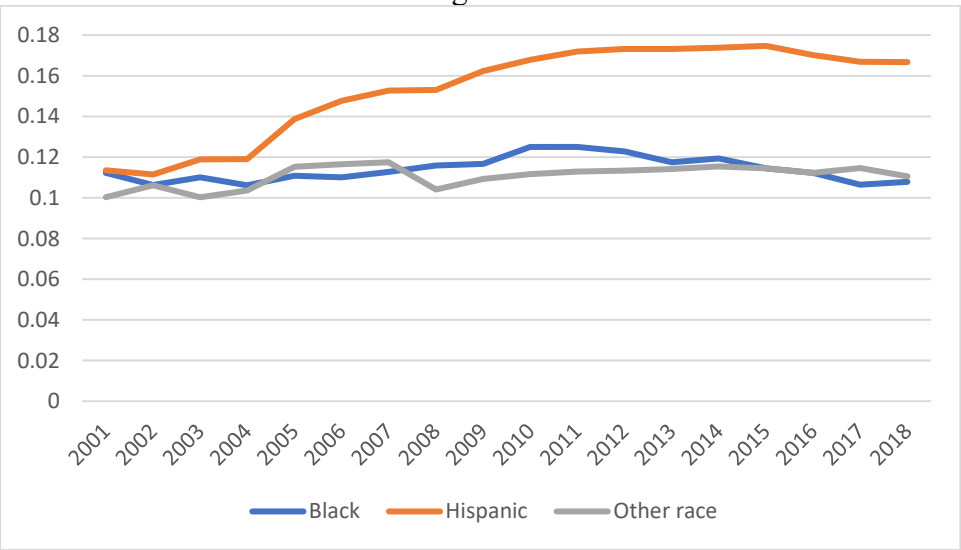


Appendix Figure 1b: Percentage Race / Ethnicity Trends by Couple Type, Men

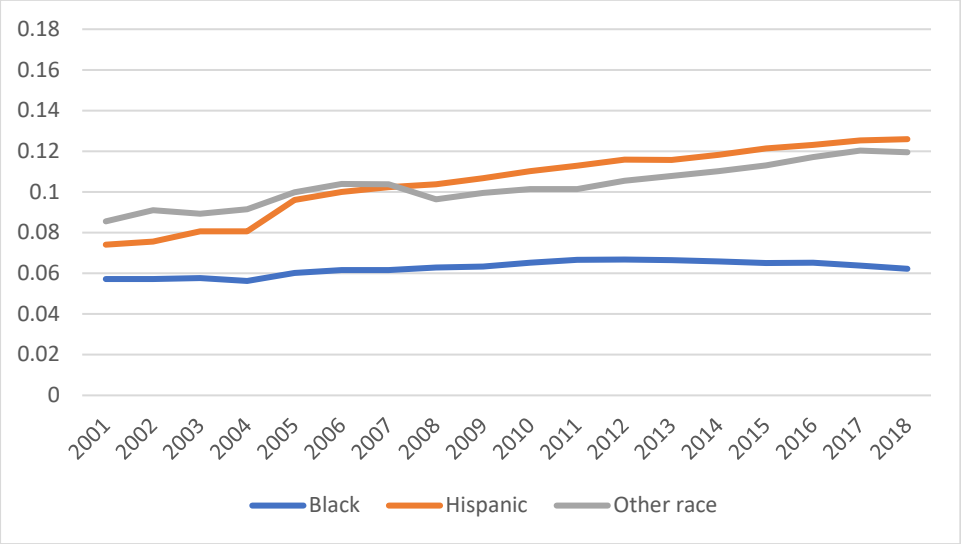
Gay Men



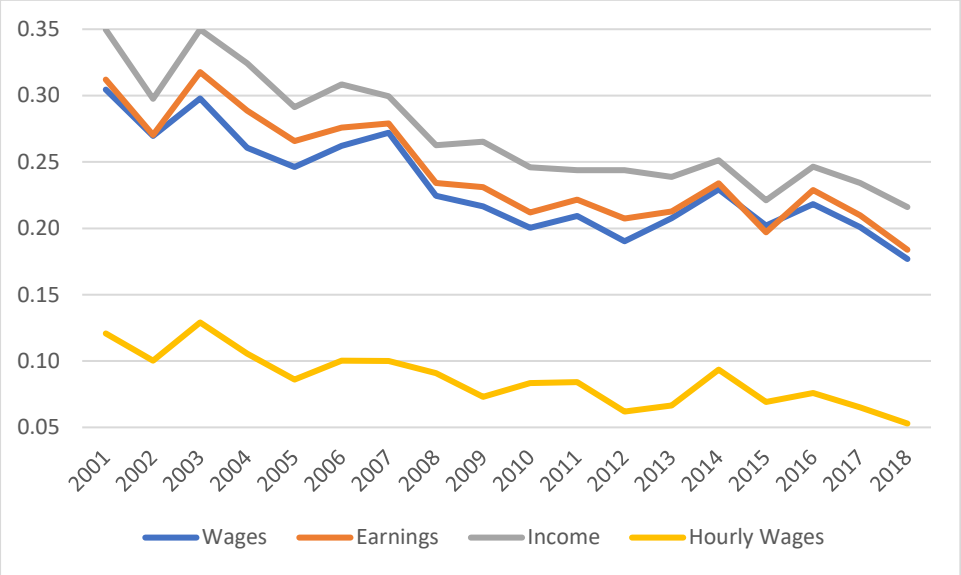
Different-sex Unmarried Cohabiting Men



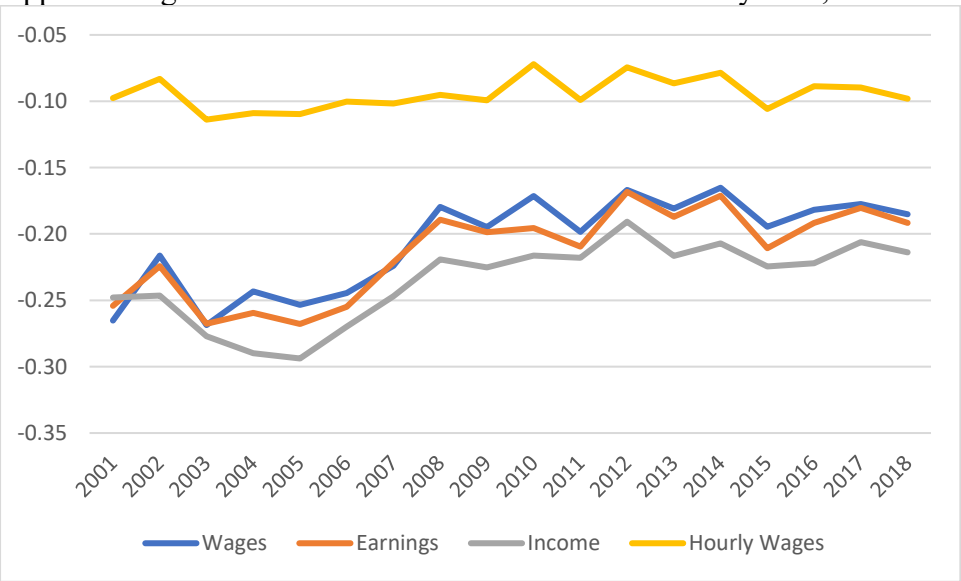
Different-sex Married Men



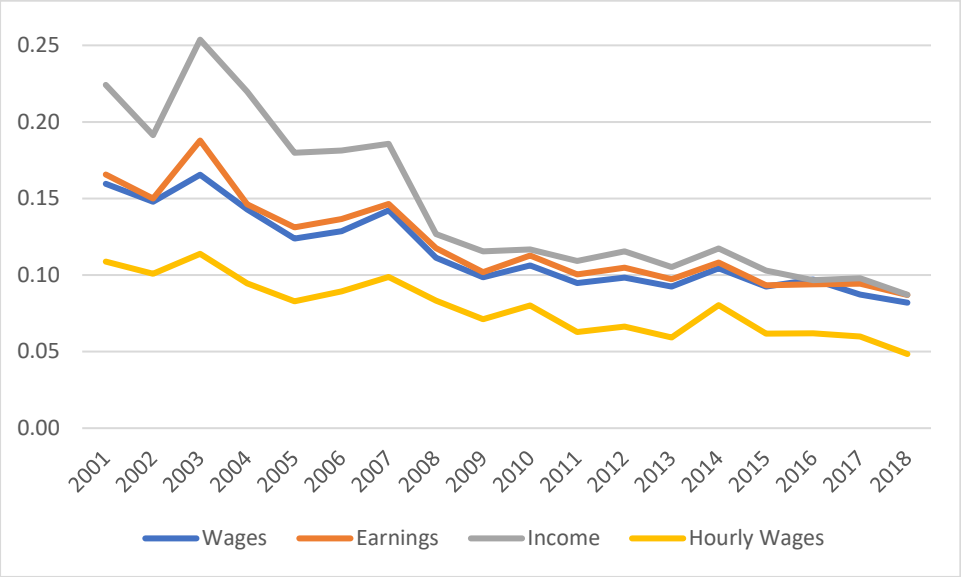
Appendix Figure 2a: 2001-2018 ACS Coefficients for Lesbian, All Workers



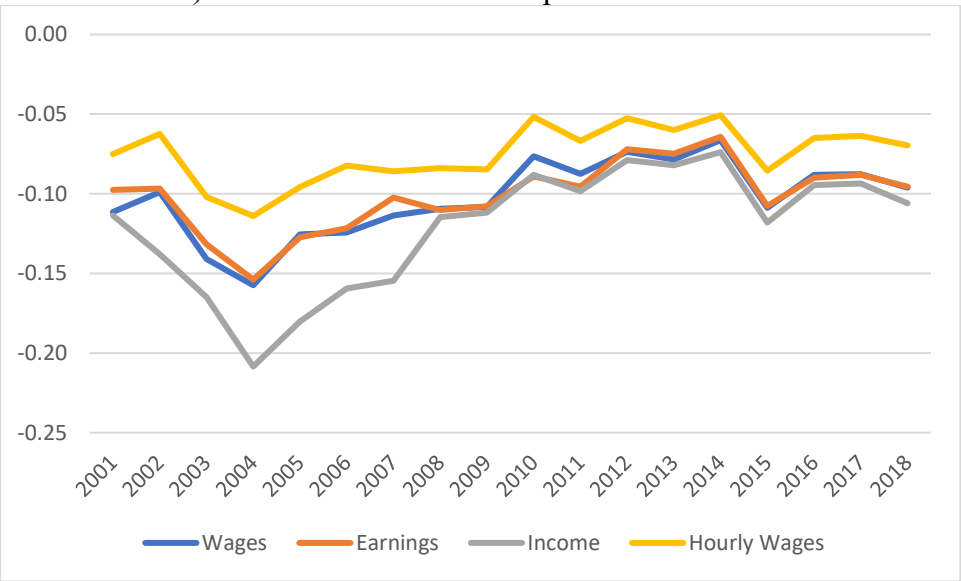
Appendix Figure 2b: 2001-2018 ACS Coefficients for Gay Men, All Workers



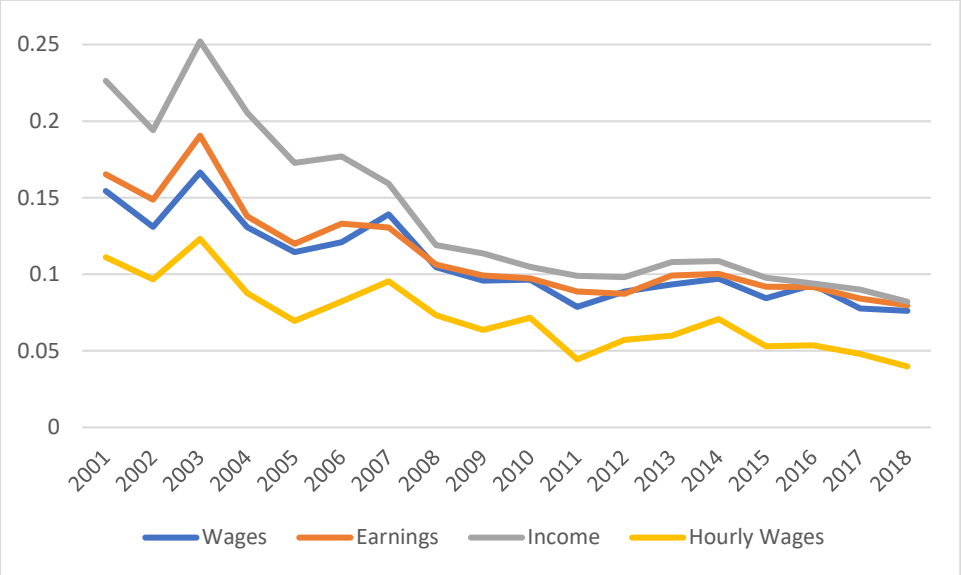
Appendix Figure 3a: 2001-2018 ACS Coefficients for Lesbian Compared to All Married and Unmarried Women in Different-sex Couples



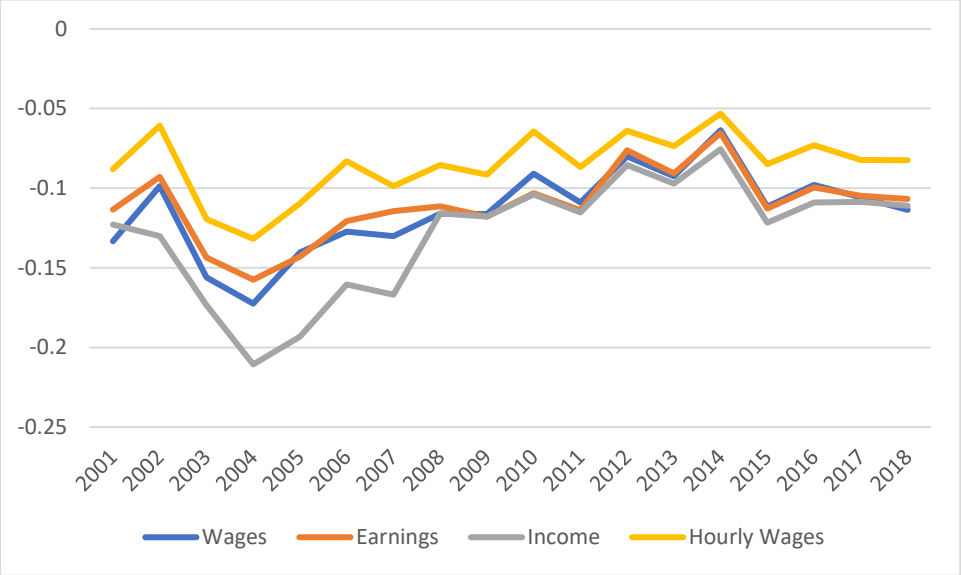
Appendix Figure 3b: 2001-2018 ACS Coefficients for Gay Male Compared to All (Married and Unmarried) Men in Different-sex Couples



Appendix Figure 4a: Weighted 2001-2018 ACS Coefficients for Lesbian, 2001-2018 ACS



Appendix Figure 4b: Weighted 2001-2018 ACS Coefficients for Gay Male, 2001-2018 ACS



Appendix Table 1: Descriptive Statistics Sample Size by Couple Type and Year

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Women									
Lesbian	2,580	2,207	2,836	2,945	7,190	7,231	7,249	5,615	5,847
Cohabiting	17,493	15,689	17,785	18,281	43,662	45,696	47,168	49,392	50,746
Married	218,055	196,692	217,469	217,137	519,169	517,836	520,765	515,781	513,758
Men									
Gay Male	2,803	2,634	3,081	3,097	7,898	8,171	7,740	5,213	5,446
Cohabiting	17,266	15,433	17,489	17,987	42,847	44,879	46,339	48,430	49,750
Married	206,072	185,864	205,385	205,042	489,203	487,868	489,781	484,335	481,740

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Women									
Lesbian	5,958	5,982	6,253	7,090	7,456	8,142	8,124	8,949	9,251
Cohabiting	54,642	53,406	54,436	57,248	57,756	59,655	59,461	62,003	63,785
Married	505,431	489,473	488,887	489,545	482,006	481,236	478,952	480,694	478,900
Men									
Gay Male	5,576	5,605	5,827	6,873	7,171	7,800	8,092	8,384	9,050
Cohabiting	53,563	52,407	53,307	55,962	56,492	58,369	58,157	60,602	62,274
Married	473,674	456,946	455,773	456,271	447,919	447,381	444,214	446,504	444,124

Notes: For all the descriptive statistics, the sample is limited to couples who are the head of household or the partner of the head of household, ages 18 to 64. If either the head or partner has allocated values for sex or relationship to head of household, both the head and the partner are dropped from the sample. In contrast, the regression sample is limited to individuals with non-allocated values of labor-market outcomes, and the wage / earnings / income regressions are limited to people with positive non-allocated values of wages /earnings / income.