

Right to Work and Racial and Gender Wage Gaps

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I. Introduction

In an effort to offset the ability of organized labor to improve the earnings and working conditions of American workers, many municipalities have pursued paid leave, prevailing wage, project labor agreements, fair schedules and minimum wage legislation. A recent study by the Economic Policy Institute finds that state legislatures are using preemption laws to void the local efforts to improve the wages of workers and their application of these efforts has sped up since 2013.¹

Right to Work (RTW) laws are an older state-level strategy used to weaken the efforts of unions and pro-worker organizations. In 1979, 20 states had RTW laws on the books. Today, 28 states have right-to-work laws. The most recent adopters are West Virginia, and Kentucky. They passed their RTW legislation in 2017.² Early in 2017, the Missouri legislature passed and the state’s governor signed right-to-work legislation. It was scheduled to become state law August 2017; however, anti-right-to-work groups were able to collect enough signatures to make it a ballot initiative in the November 2018 election. Alabama’s legislature amended an existing RTW law in 2016. From 2013 to 2015, state legislatures in Wisconsin, Michigan and Indiana introduced and passed RTW laws. Organized labor and worker advocate groups are concerned because RTW laws place restrictions on the ability of unions to collect dues from the workers they represent and influence the employment contract with management. To date, the consensus of the literature is that RTW laws have a negative impact on wages of 2.1 to 9.3 percent.

Although there is an extensive literature on the impact that collective bargaining has on racial and ethnic earnings inequality, little is known about how RTW laws impact these dimensions of earnings inequality.³ The only study that I found which explicitly estimates racial impacts is Bruno et al (2015). Using the 2003 to 2012 CPS, they find that African Americans in

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RTW states earn 1.9 to 8.5 percent less than African Americans in collective bargaining states.

Women in RTW states experience wage disadvantages that range from 1.9 to 7.6 percent.

All of these estimates regardless of race are potentially biased. The MORG-CPS on which many of these estimates are based only contains a respondent’s “state of residence” as opposed to their “state of work”. Using the former on which to sort workers in to RTW and non-RTW states creates a misclassification or measurement error. The law applies to the state in which a respondent works and not the state in which they live.

The paper has two goals. First, correct previously estimated RTW effects for the bias associated with using “state of residence” to sort workers in to RTW and non-RTW states. Second, generate estimates of the impact that RTW status has on minorities and women.

To assess whether the MORG-CPS estimates in previous studies are biased, I use the American Community Surveys (ACS) from 2000 to 2015. The benefit of these files is that they contain information on a worker’s “state of residence” and “state of work”. The drawback is that the files do not contain information on union membership. To address this limitation, I utilize the union membership information in the MORG-CPS files to generate a model that can be used to predict an individual’s union membership in the ACS files.

I find that a bias associated with using “state of residence” to identify an individual’s exposure to RTW laws does exist. In the national samples, the bias is downward. RTW wage effects based on “state of residence” are too small. Among Midwestern workers, the bias is upward. RTW wage effects based on “state of residence” are too big. In both cases, minority estimates contain the largest bias.

The corrected ACS “state of work” estimates indicate that in the U.S. samples, RTW laws have the largest negative impact on African American men and women. Limiting the

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sample to the three Midwestern states that recently became RTW suggest that the law has the biggest adverse impact on Latinos. However, it is important to note that the Midwestern estimates are uniformly below the U.S. estimates.

To explore how RTW, union membership, and state-level union density contribute to black-white and Latino-white earnings gaps, I construct Oaxaca-Blinder earnings decompositions. The findings reveal that racial and ethnic differences in RTW exposure explain none of the racial and ethnic earnings gaps among men. The differences in exposure explain a small portion of the earnings gap between black and white women.

Similar to previous studies, racial differences in union membership and state union density help to explain the black-white earnings gap among men. Depending on the decomposition’s weights, union membership and state union density help to narrow the black-white wage gap among men by 4.8 to 11.1 percentage points, and 1.1 to 3.9 percentage points among black and white women.

Ethnic differences in union membership and state-level density contribute to the earnings gap between Latino and white men. Union membership and state-level union density explain 1.9 to 4.6 percentage points of their over 40.0 percent earnings gap. Among women, racial and ethnic differences in union membership and state union density explain none of the black-white and Latino-white earnings gaps.

The paper is organized as follows. Section II describes the recent literature. Section III describes the data and methods. In particular, I develop a measurement error model to illustrate the potential bias that may exist in past studies. Sections IV and V discuss the results and Section VI summarizes and concludes.

II. Literature Review

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Bruno et. Al. (2015) review the seven major studies that are published from 1980 to 2011. They conclude that when a comprehensive list of controls are included in the model, RTW laws are associated with wages that are 0.0 to 5.0 percent lower in RTW states. For example, Manzo, Zullo, Bruno, Quesada (2013) find that RTW laws are associated with a 2 to 8 percent reduction in earnings, with an average reduction of approximately 6.0 percent.

More recently, Gould and Kimball (2015), an update of Gould and Shierholz (2011) analyze the 2010 to 2012 MORG-CPS files and find that wages in RTW states are 13.6 percent lower than those in non-RTW states. When they control for demographic and individual level labor market controls, state-level labor market controls and cost of living, the disadvantage falls to 3.1 percent.⁴ Their models control for gender, age and age squared (proxy for experience), marital status, race/ethnicity, education, full-time status, hourly status, union status, occupation and industries. The state unemployment rate and measures of cost of living are included along with dummy variables for year. The earlier, Gould and Shierholz (2011) study uses the 2009 MORG-Current Population Survey and includes the same set of socioeconomic factors and individual demographic characteristics. They obtain a wage gap of 3.2 percent. These and other studies control for race and gender but do not estimate separate RTW effects for men and women, or for minorities. Neither study expresses concern with using the respondent’s “state of residence” information to identify their exposure to a RTW law.

In some of the most recent work, Manzo and Bruno (2017) use the MORG-CPS from 2000 to 2016 to compare Indiana, Michigan and Wisconsin to Minnesota, Ohio, and Illinois. The former became RTW states between 2000 and 2016. They use the latter as a control group. They find that the creation of the RTW laws in Michigan, Wisconsin, and Indiana is associated with a 2.6 percent decline in hourly wages. The unionization rate in the RTW states falls by 2.1 percent.

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Some argue that these estimates are at the lower end of the range of estimates because the RTW laws have only been in place for several years.

This paper’s concern is that the RTW estimates in Manzo and Bruno, plus earlier studies that also use the MORG-CPS are biased because of two misclassifications: 1) respondents that live in RTW states, but actually work in non-RTW states, and 2) respondents that live in non-RTW states, but actually work in RTW states. If “state of work” is the appropriate classification because the law applies to where a respondent works and not where they live, then respondents in misclassification 1) are incorrectly designated as being affected by a RTW law. Using the same logic, respondents in misclassification 2) are incorrectly designated as not being affected by a RTW law. Further, Manzo and Bruno (2017) do not generate estimates for minorities and women.

My review of the literature finds only one study that explicitly estimates the impact that RTW laws have on minorities and women. Using the 2003 to 2012 CPS, Bruno et. Al. (2015) find that African Americans in RTW states earn 1.9 to 8.5 percent less than African Americans in collective bargaining states. Women in RTW states also experience wage disadvantages that range from 1.9 to 7.6 percent.

In summary, the existing literature contains very few estimates of the differential impact that right-to-work laws have by race and gender. Why might racial and gender differences exist? There are several mechanisms. First, minorities and women could tend to live/work in lower paying RTW states. It is well known that a disproportionate share of RTW states are in the south and now the Midwest (e.g., Michigan) which have large black populations. Thus, when a RTW dummy variable is added to the earnings equation, the estimated racial or gender pay gap would shrink. Second, the penalty associated with living/working in a RTW state could be larger for minorities and women. This effect would be captured by estimating separate earnings equations for blacks and whites and men and women, and comparing the RTW coefficients. RTW laws may have another disparate wage effect by race. A RTW law lowers union membership and state-level union density, which then dampens the union wage effect,

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the wage premium that workers earn from having access to collective bargaining. If African Americans are more likely to be members of unions, then their relative earnings will fall.

These effects can be used to construct a “Total Wage” impact, which is the sum of the RTW effect and the product of the “Union Effect” on wages and the RTW effect on unionization. As a result, RTW laws could have disparate impacts in three ways: RTW Effect on Wages, Union Effect on Wages, and RTW Effect on Unionization. The next section describes the data and models used to estimate the three impacts.

III. Data and Methods

To estimate the impact that RTW laws have on earnings, I use samples of white, Latino and African American workers from the Merged Outgoing Rotation Group Files of the Current Population Survey (MORG-CPS 2000 to 2016). To be included in the MORG-CPS sample, the respondent must work full-time and have a complete set of information on race, ethnicity, educational attainment, age, marital status, industry of employment, private sector employment, metropolitan residence, union and collective bargaining information. The MORG-CPS data contains respondent information on union membership. To identify exposure to a RTW law, a respondent’s “state of residence” is used to classify their exposure. The state union density and RTW designations come from unionstats.com developed by Barry Hirsch and David Macpherson.⁵

The drawback to the MORG-CPS is that the state geographic indicator refers to one’s residence. The MORG-CPS files do not contain information on the respondent’s state of work. Bruno et. al. (2015) acknowledge this data limitation and that their estimated impacts could be biased; however, they don’t speculate as to the size and direction of their RTW wage effect’s bias. To my knowledge no study has explored the consequences of using “state of residence” as the indicator to identify exposure to RTW laws.

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To estimate the potential bias associated with using “state of residence” as the indicator to classify a worker’s exposure to RTW laws, I use the 2000 to 2015 American Community Survey (ACS) files. The ACS files contain a respondent’s information on their “state of residence” and “state of work”, which allows me to generate estimates based on two RTW classifications: one based on “state of residence” and the other based on “state of work”. I will compare the estimates derived from each classification, where “state of work” serves as the “correct” classification because it corresponds to how the law is applied in practice.

To be included in the ACS sample, a respondent must be 16 to 65 years of age, work full-time and full-year, plus have the following information: race/ethnicity, age, educational attainment, industry of employment, hours and weeks worked, marital status, type of work, and gender.

One difference between the ACS and MORG-CPS is the earnings measure. The ACS earnings correspond to annual earnings and the MORG-CPS earnings are hourly earnings. The next version of this paper will use an ACS hourly earnings that is constructed from a respondent’s annual earnings, hours and weeks worked. The Bureau of Labor Statistics’ CPI-U is used to convert nominal earnings to real earnings. Similar to the MORG-CPS, each respondent’s information is merged to the Hirsch and MacPherson state-level data on right-to-work status and union density.

The disadvantage with the ACS is that there is no information on an individual’s union membership status. To address this data limitation, I first use the MORG-CPS data to construct a union membership prediction model. I then utilize the MORG-CPS model’s coefficients and the

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characteristics of ACS individuals to predict their union membership. This prediction is included in the ACS earnings regressions.

In a first step to quantify the RTW misclassification problem, Table 1 presents a 2 by 2 table where the rows correspond to RTW status based on “state of residence”. The columns correspond to RTW classification based on “state of work”. The diagonal elements refer to respondents whose “state of residence” and “state of work” are the same. So, there is no classification error in these elements. The Table’s off-diagonals are the sources of misclassification. The first are respondents who live in a RTW state but do not work in a RTW state (e.g., Respondents who live in Wisconsin, but work in Minnesota). Using “state of residence” incorrectly classifies them as RTW. Respondents who do not live in a RTW state, but work in a RTW state (e.g., Respondents that live in Illinois, but work in Indiana) are incorrectly classified as non-RTW. There are additional sources of misclassification. For example, individuals that live in these six Midwestern states may work in RTW states outside the Midwest (e.g., Oklahoma). To maintain consistency with Bruno et. al., this version of the paper excludes respondents that live outside the six states, but work in these states. The paper also excludes respondents that work in the six states, but live outside them.

What is the bias in the RTW wage effects if the “state of residence” information is used to classify whether the respondent is exposed to a RTW law? There are two scenarios that we have to consider. First, based on the literature review, it is reasonable to assume that RTW status is associated with lower wages, thus classifying respondents as RTW, but incorrectly placing them in the non-RTW sample, lowers the wages of the non-RTW sample. This causes the wage gap between RTW and non-RTW workers to be biased toward zero. Second, classifying an

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individual as non-RTW, but incorrectly treating them as RTW, increases the wages of the RTW sample. This scenario also causes the wage gap between RTW and non-RTW workers to be biased toward zero. Thus, previously estimated RTW wage effects using the MORG-CPS files are potentially underestimates of the true relationship between RTW status and earnings.

A basic measurement error model can be utilized to formally illustrate the potential bias associated with using “state of residence” to identify exposure to RTW laws. The “true” model can be written as the following:

$$1) \quad y_i = \beta_1 X_i^{sow} + \beta_2 U_i^{sow} + \beta_3 Z_i + \varepsilon_i,$$

where y_i denotes the logarithm of earnings of the i th respondent, X_i^{sow} denotes a dummy variable that equals 1 if the i th individual works in a right to work state and zero otherwise, U_i^{sow} denotes the union density of the i th individual’s state, Z_i is a vector of exogenous information: educational attainment, age, marital status, industry, private sector status, metropolitan residence, and immigration status. The term ε_i is an unobservable individual component, and is assumed to be uncorrelated with X_i^{sow} , U_i^{sow} and Z_i .

In the MORG-CPS files, we do not observe X_i^{sow} and U_i^{sow} , the “true” state in which the respondent works and the “true” union density; however, we do observe X_i^{sor} and U_i^{sor} the i th individual’s state of residence and their state’s union density, which we assume serves as a proxy for the “true” states of work and union density with some error:

$$2) \quad X_i^{sor} = X_i^{sow} + v_{i1},$$

$$3) \quad U_i^{sor} = U_i^{sow} + v_{i2},$$

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where the v_i 's are unobservable individual components that are uncorrelated with X_i^{sow} , U_i^{sow} , Z_i and y_i . The RTW errors take on the values of -1 or +1. They are -1 when the respondent lives in a RTW state but works in a non-RTW state. The error is +1 when the respondent does not live in a RTW state, but works in a RTW state. Equations (2) and (3) show that “state of residence” and the union density in one’s “state of residence” serve as proxies for “state of work” with measurement error v_{i1} and union density state of residency with measurement error v_{i2} .

Substituting (2) and (3) into (1) yields:

$$4) \quad y_i = \beta_1 X_i^{sor} + \beta_2 U_i^{sor} + \beta_3 Z_i + w_i,$$

where β_1 measures the wage or earnings gap between individuals that reside in non-RTW and RTW states, and $w_i = \varepsilon_i - \beta_1 v_{i1} - \beta_2 v_{i2}$. Assume for the moment that Z_i is a single variable such as an individual’s union membership, the probability limit of the OLS estimate of β_1 is:

$$plim \widehat{\beta}_1 = \frac{\beta_1 + \beta_2 \sigma_{x,sow}^2 (\sigma_{x,u}^{sow} + \sigma_{U,v_1}^{sow}) + \beta_3 \sigma_{x,sow}^2 \sigma_{x,sow,Z}}{1 + \frac{\sigma_{v_1}^2}{\sigma_{s,xow}^2}} .$$

The variances ($\sigma_{v_1}^2$ and $\sigma_{x,sow}^2$) denote the variances of the measurement error and RTW variable based on “state of work”. The ratio of these variances is referred to as the ‘reliability ratio’, the fraction of the observed variance in RTW status based on “state of residence” that is attributable to measurement error.

Typically, in measurement error models the bias is negative and thus the OLS estimates are too small. However, when an additional predictor is measured with error, the numerator contains a second term. With the presence of an additional predictor, Z_i , that is assumed to be measured without error, a third term in the numerator is added. With the addition of these terms,

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the bias includes several covariances which can then make the bias positive, which leads the estimated RTW OLS wage effects to be biased upward. The inclusion of additional Z_i 's makes it even harder to assess the direction of the bias.

I estimate three RTW impacts. The first effect measures the “direct” impact of RTW on earnings. The second captures the impact that union membership has on earnings. These two effects come from a log earnings equation where dummy variables for RTW and union membership are included in the model. These effects are adjusted for age, education, marital status, veteran status, public sector work, metro status and year dummy variables.⁶ The third quantifies the impact of RTW on union membership and comes from a linear probability model of union membership on a RTW dummy variable, a state’s union density, the individual’s age, educational attainment, veteran status, marital status, public sector work, metropolitan residence status and year dummy variables. The product of the second and third effects identifies RTW’s “indirect” effect on wages. These modes are estimated by race/ethnicity and gender (e.g., white men). To construct the “total” RTW wage effect, I compute the following:

$$\text{Total Effect} = \text{RTW Effect on Wage} + \text{Union Effect on Wages} * \text{RTW on Unionization}$$

The standard errors for each component of the Total Effect are easily obtained from the regression output; however, the Total Effect’s standard error requires an explanation. Let β_1 denote the coefficient for the RTW effect on wages. Let β_2 denote the coefficient on the Union Effect on Wages and let γ_1 denote the coefficient on the RTW on Unionization effect. Let θ equal the Total Wage effect: $\beta_1 + \beta_2 * \gamma_1$. Assuming that β_1 is independent of β_2 and γ_1 , the variance of θ equals $\text{Var}(\beta_1) + \text{Var}(\beta_2 * \gamma_1)$. The first term is just the variance of the coefficient on the RTW

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Effect on Wages. To construct the variance of the product of β_1 and β_2 , I use the following formula. The $\text{Var}(\beta_2 \gamma_1)$ equals $\text{Var}(\beta_2)\text{Var}(\gamma_1) + \text{Var}(\beta_2)E^2(\gamma_1) + E^2(\beta_2)\text{Var}(\gamma_1)$.

To describe the role that RTW laws contribute to racial and ethnic earnings gaps, I estimate Oaxaca (1973) and Blinder (1973) wage decompositions. The technique enables me to identify whether differences in racial and ethnic earnings gaps are due to differences in exposure to RTW laws. For example, to decompose the black-white earnings gap, the previous earnings equation is estimated for African Americans and whites ($i = b, w$):

$$1) \quad \ln W_i = \beta_1 X_i^{sow} + \beta_2 U_i^{sow} + \beta_3 Z_i + \varepsilon_i,$$

where $\ln W_i$ denotes the natural logarithm of earnings; X_i denotes the RTW status of the i th individual, Z_i denotes a matrix of observed attributes such as educational attainment, age, and labor market conditions; the β 's denote the vector of regression coefficients that capture the economic returns of each attribute; and ε_i is the standardized residual (meaning that it is distributed with a mean of zero and variance of one).

The white-black earnings gap can then be constructed by differencing the black and white earnings equations. Doing so leads to the following expression:

$$2) \quad \ln W_w - \ln W_b = (X_w^{sow} - X_b^{sow})\beta_w + (Z_w - Z_b)\theta_w + X_b^{sow}(\beta_w - \beta_b) + Z_b(\theta_w - \theta_b) + (\varepsilon_w - \varepsilon_b).$$

The left-hand side is the total log earnings differential between whites and blacks. On the right-hand side the first and second terms are the explained gap (portion of the gap attributed to racial differences in RTW status and measured productivity characteristics). The third term is the

residual gap (the portion attributed to racial differences in market returns to RTW status and those characteristics. The fourth term equals zero because I evaluate the decomposition at the means. This equation can be rewritten where the black coefficients are used as the weights or market returns. Decompositions using both weighting structures are presented.

IV. Right-to-Work Effects Revisited

Table 2 reports summary statistics by RTW status for the pooled 2000 to 2016 MORG-CPS files. RTW classification is based on a respondent’s state of residence. Panel A reports the means for all respondents. Panel B reports the summary statistics for respondents that reside in the six Midwestern states, three of which recently adopted RTW legislation: Wisconsin (2015), Michigan (2013), and Indiana (2012). Over this same period, Minnesota, Ohio, and Illinois maintained their non-RTW status. Our outcome of interest, the natural logarithm of real hourly earnings confirms the findings of previous literature. The average log real hourly earnings in RTW states are typically lower than the average log real hourly earnings in non-RTW states. Among U.S. men and women, the differences are 10.0 and 13.0 percent.⁷ The earnings disadvantage among African American men and women sits at the upper end of this range, 12.0 and 14.0 percent respectively. The RTW earnings gaps among Latino men and women are smaller: 5.0 and 10.0 percent.

Panel B reports the summary statistics for the six Midwestern states. The average real hourly wages are 3.0 to 5.0 percent higher in RTW states. These higher earnings cannot be due to union membership and density. The rates in RTW states are lower than in non-RTW states. The differences in personal characteristics such as education and metropolitan area residence are such that they explain why earnings are higher in the RTW states. The private sector difference is the only one that supports why earnings in RTW states exceed non-RTW states. Based on these

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comparisons, Bruno et. al. offers them to support their choice of Ohio, Illinois, and Minnesota as a “control” group for Wisconsin, Indiana and Michigan. However, some analysts argue that the Midwestern gaps are smaller or favor workers in RTW states because the time since implementation of the law has only been several years. It takes time for the laws to have an impact.

The differences in Panel A of Table 2 may be influenced by factors other than RTW laws. For example, non-RTW states have higher union densities than RTW states.⁸ Given that a higher union density is associated with higher earnings, some of the earnings gap between RTW and non-RTW states could be due to this relationship. The racial, ethnic, educational attainment, and metropolitan residence differences shown in Table 2 could also explain a small portion of the earnings gaps. Workers in RTW states are more likely to be minority, less likely to have completed a college degree and live in higher paying central city and suburban areas. Many workers in these groups earn less regardless of their background. The age, marital status, immigration status, and private sector differences between RTW and non-RTW workers are quite minimal, indicating they contribute very little to the earnings gap between RTW and non-RTW workers.

Table 3 presents my attempt at replicating MORG-CPS-based estimates of RTW earnings and union membership effects. These effects are adjusted for differences in RTW and non-RTW state union density, union membership status, race and ethnicity, age, educational attainment, veteran status, marital status, private sector status, foreign born and U.S. citizen status, metropolitan residence, industry of employment and year dummy variables. An “a” indicates that the estimate is not significantly different from zero. A “b” denotes significance at the 5 percent level. A “c” indicates a 10 percent level of significance. The discussion will focus solely on the

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RTW wage effects because the RTW unionization effects are negligible. That is, although union membership is associated with approximately 10 percent higher earnings, workers do not experience losses in this dimension because RTW’s impact on unionization is very small.

As a reminder, in the MORG-CPS files, exposure to a RTW law is determined by linking the state-level RTW designation to a respondent’s “state of residence”. The estimates for men and women lie within the range found in the literature. Panel A reveals that among U.S. men, male earnings in RTW states are 4.1 percent lower than in non-RTW states. Limiting the sample to respondents in the six Midwestern states causes the estimated RTW wage disadvantage to fall to 2.5 percent and the positive association between an individual’s earnings and union membership increases from 9.0 to 10.5 percent. In the national sample, men’s union membership is 7.1 percentage points lower in RTW states than in non-RTW states; however, this difference narrows to 1.8 percentage points when only Midwestern men are used in the sample. Combining the three estimates generates a “Total RTW” earnings disadvantage of 4.8 percent at the U.S. level and 2.7 percent in the six Midwestern states.

The estimates indicate that African American men that live in RTW states experience a 6.0 percent wage disadvantage relative to African American men that live in non-RTW states. When the sample is limited to Midwestern African American men, the RTW wage disadvantage falls to 2.0 percent. Note, the estimate has little precision. The “Total Wage” effect among African American men shifts from 6.5 percent in the U.S. sample to an imprecisely estimated 1.0 percent in the Midwestern sample. The national estimates for Latinos suggest that men in RTW states earn 4.4 percent less than Latino men in non-RTW states. The estimate among Latino Midwestern men is positive, indicating that Latino men in Midwestern RTW states earn slightly

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more than non-Midwestern RTW Latino men; however, the estimate of 1.8 percent lacks any precision.

Panel B reports the RTW estimates for women. The story is virtually the same as for men. Among all women, those that live in a RTW state earn 5.8 percent less than women in non-RTW states. The disadvantage falls to 3.2 percent when only Midwestern women are included in the sample. Black women who live in RTW states experience a 10.0 percent disadvantage, 4 percentage points larger than black men. The disadvantage vanishes when Midwestern African American women are only included in the sample. Regardless of sample, Latino women who live in RTW states earn less than their counterparts that live in non-RTW states. The disadvantage ranges from 4.5 to 5.9 percent.

As discussed and shown earlier, the estimates are potentially biased because “state of residence” is used to identify an individual’s exposure to RTW laws. An individual’s “state of work” is more appropriate to sort respondents because unless the individual lives and works in the same state, RTW law applies to where one works and not where they live. To estimate the extent to which the estimates in Table 3 are biased, I switch to the 2000 to 2015 ACS files. The first step is to assess the extent to which respondents are improperly coded, or assigned the wrong RTW status.

To do this, Table 4 reports joint frequency and probability distributions of RTW status based on “state residence” and “state of work”. As discussed earlier, the off-diagonals of the matrices are the entries of concern. For example, in the U.S. sample, 16,439 men live in a RTW state and work in a non-RTW state.⁹ This represents 0.50 percent of the overall sample. The other off-diagonal indicates that 15,711 respondents live in non-RTW states and work in RTW states, which corresponds to 0.50 percent of the sample. In the U.S. samples, African American

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men have the largest percentage of misclassified respondents; however, the 0.8 percent is not too different from the other groups. The 0.4 percent for Latino women is the smallest share of misclassified respondents. The misclassified observations in the Midwestern samples are slightly larger than the U.S. samples. They range from 0.7 percent for African American women to 1.6 percent for all men. These small percentages suggest that the bias to the estimates in Table 3 will be small.¹⁰

Table 5 reports the average log annual earnings for each “state of residence” and “state of work” pair. Studying these four pairs provides an initial clue as to the direction of the bias in previously estimated RTW wage effects. The average earnings in the main diagonals are consistent with past studies. Earnings in RTW states are lower than non-RTW states. The group of men that live in non-RTW states and work in non-RTW states have average earnings that are 13.0 percent higher than men who live and work in RTW states. For women, the difference is 18.0 percent. Black men that live and work in non-RTW states have earnings that are 20 percent higher than black men that live and work in RTW states. The advantage is even larger 26.0 percent for African American women that live and work in non-RTW states. Latino men and women who live and work in RTW states earn 5.0 and 11.0 percent less.

The second and third columns report the average earnings of respondents whose RTW exposure is incorrectly classified. To correctly classify the respondents in the second column (e.g., live in a non-RTW state but work in a RTW state), they need to be moved from column (1) to column (4). In every race/gender group, they earn more than respondents that live and work in RTW states. Thus, their correct inclusion to column (4) will raise the average wage of those that live and work in RTW states. The respondents that live in a RTW state and work in a non-RTW state (third column for U.S.) have average earnings that exceed column (1), their correct

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classification. Correctly classifying these individuals by lumping them with respondents that live and work in non-RTW states (column (1)) raises the average earnings.

Since the correct classification of the 2nd and 3rd columns of respondents raises the earnings of both groups, the direction of the bias in the RTW earnings gap depends on the relative proportions of workers that get reclassified correctly and their average earnings. For example, the RTW earnings gap among U.S. men will widen because the proportions are similar, but the average earnings of those that live in a RTW state and work in a non-RTW state (column 3) are 12 percent higher than individuals that live in a non-RTW state and work in a RTW state. When differences for educational attainment, age, and the other variables are included, the gap could either narrow or expand. As shown earlier in the errors-in-variable model, the direction of the bias depends on the covariances between the RTW indicator and the additional characteristics that are included in the model.¹¹

Table 6 compares the RTW effects based on the two classification approaches: “state of residence” versus “state of work”. Before discussing the bias, it is important to compare estimates based on “state of residence” from the ACS and MORG-CPS. Does switching data sets lead to different RTW wage effects? Except for Black women, the ACS RTW wage effects based on state of residence are smaller than the MORG-CPS effects (Table 3 versus Table 6). The largest differences occur among all men and Latino women. The opposite occurs when the sample is limited to Midwestern workers. The “state of residence” ACS RTW wage effects exceed the “state or residence” MORG-CPS effects.

In general, Table 6’s U.S. results suggest that past RTW wage effect estimates based on state of residence are biased downward. The African American estimates contain the largest bias. They are biased downward by 37.0 percent. The wage effect among African American men

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equals 5.6 percent when state of residence is used to classify RTW exposure and 8.9 percent when state of work is used to correctly classify one’s RTW status. The comparable effects among African American women are 11.9 to 13.3 percent. This corresponds to a downward bias of 11.0 percent.

The Midwestern samples suggest that RTW wage effect estimates in previous studies based on “state of residence” are biased upward. All of the estimates (except for Latino women) get smaller when “state of work” is used to correctly classify one’s exposure to RTW laws. An important result is that African American men and women who live in the three Midwestern states that recently enacted RTW laws experience a 2.7 and 4.5 percent earnings disadvantage. The 2.7 percent estimate for men suggest a bias of 46 percent, while the 4.5 percent estimate for women suggest no bias associated with using “state of residence” as the proxy for where one works. The Latino wage effects are larger, ranging from 5.9 to 6.8 percent. The men’s estimate of 5.9 percent reveals a bias of 10.7 percent. Similar to African American women, the Latino women estimate indicates very little if any bias associated with using “state of residence” to classify RTW exposure.

To make it easier to summarize the bias associated with using “state of residence” instead of “state of work” on which to identify a respondent’s exposure to RTW laws, Table 7 reports the RTW wage effects for the following samples: 1) MORG-CPS state of residence, 2) ACS state of residence, and 3) ACS state of work.

We learn the following from the MORG-CPS and ACS “state of residence” estimates. The national MORG-CPS estimates for men slightly exceed the national ACS estimates, while the Midwestern MORG-CPS state of residence estimates for men are lower than those in the ACS. For women, the national estimates from each data set are similar. The only significant

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difference is that Midwestern Black women are at parity in the CPS state of residence estimate, but the ACS estimates suggest a 4.8 percent earnings disadvantage.

A comparison of the ACS “state of residence” and “state of work” estimates supports my claim that a bias exists. In the national data, the bias is downward. RTW wage effects based on state of residence are too small. Among Midwestern workers, the bias is upward. RTW wage effects based on “state of residence” are too big. In both cases, minority estimates contain the largest bias. In the national sample, we understate the adverse effects that RTW has on minorities. In the Midwestern sample, we overstate the adverse effects that RTW has on minority workers. These biases seem to be worse for minority men.

Focusing on the ACS “state of work” estimates, Table 7 shows that at the national level, RTW laws have the biggest negative impact on African American men and women. Limiting the sample to the three Midwestern states that recently became RTW and the three states that form the control group indicates that the law has the biggest adverse impact on Latinos. However, it is important to note that the Midwestern estimates are uniformly below the U.S. estimates. This is consistent with previous conclusions that the effects are smaller in these states because they recently adopted the laws and it takes time for organized labor’s power to erode.

One potential limitation of these estimates is that they do not control for cost of living differences. Gould and Kimball (2015) find that the exclusion of these measures generates omitted variable bias. The estimates in this paper are larger than their RTW wage effects, thus I predict that when I control for cost of living differences in the national sample, the wage effects will get smaller.

V. Right to Work’s Impact on Racial and Ethnic Earnings Inequality

Table 8 presents decompositions of racial and ethnic earnings gaps. They measure the contributions that RTW laws, union membership, and state union density have on racial and ethnic earnings inequality. For comparison purposes, the decompositions are shown when “state

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of residence” and “state of work” are used to identify an individual’s exposure to RTW laws. The major findings are as follows. Racial and ethnic differences in RTW exposure explain none of the racial and ethnic earnings gaps among men. They explain a small portion of the gap between black and white women in the U.S. sample.

Racial differences in union membership and state union density help to narrow the black-white earnings gap among men in both the U.S. and Midwestern samples. Depending on the decomposition’s weights, union membership and state union density narrow the black-white gaps by 4.8 to 11.1 percentage points for men, and 1.1 to 3.9 percentage points for women. Ethnic differences in these variables contribute to the earnings gap’s existence between Latino and white men. Union membership at the individual and state level contributes 1.9 to 4.6 percentage points to the over 40.0 percent earnings gap. This range expands slightly when the sample is limited to Midwestern Latino men.

Among women, racial and ethnic differences in union membership and state union density explain none of the black-white and Latino-white earnings gaps. I speculate that these collective bargaining measures explain a significant portion of the gender pay gaps that women experience in the labor force.

VI. Conclusion

The purpose of this paper is two-fold. First, estimate the bias associated with using “state of residence” to classify a worker’s exposure to RTW laws. To do this, I first replicate RTW estimates using the MORG-CPS files from 2000 to 2016. I then estimate the RTW effects using data from the ACS. The benefit of the ACS is that respondents are asked to report both their “state of residence” and “state of work”. The latter is the “correct” state-level measure on which

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to classify a worker’s exposure to RTW laws. RTW laws apply to where one works and not where they live.

The ACS and MORG-CPS “state of residence” estimates tell similar stories. The national MORG-CPS estimates for men exceed the national ACS estimates, while the Midwestern “state of residence” estimates for men in the MORG-CPS are lower than those in the ACS. For women, the national estimates from each data set are similar. The only significant difference is that Midwestern Black women are at parity in the MORG-CPS state of residence estimate, but the ACS estimates suggest a 4.8 percent earnings disadvantage.

A comparison of the ACS estimates based on “state of residence” to the ACS estimates based on “state of work” supports the existence of a bias. In the national data, RTW wage effects based on “state of residence” are biased downward. Among Midwestern workers, the RTW wage effects based on “state of residence” are biased upward. In both cases, minority estimates contain the largest bias.

Focusing on the ACS “state of work” estimates, the table shows that at the national level RTW laws have the biggest negative impact on African American men and women. Limiting the sample to the three Midwestern states that recently became RTW indicates that the law has the biggest adverse impact on Latinos. However, it is important to note that the Midwestern estimates are uniformly below the U.S. estimates. This is consistent with previous conclusions that the effects are smaller in these states because they recently adopted the laws and it takes time for organized labor’s power to erode.

The current estimates have several limitations. First, these models do not control for cost of living differences. Gould and Kimball (2015) find that the exclusion of these measures generates an omitted variable bias. This paper’s estimates are larger than their RTW wage effect,

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thus when I control for cost of living differences in the national sample, the effects will get smaller. It is not clear what will happen to the Midwestern estimates.

The paper’s second major contribution is to estimate the differential impact that right-to-work laws and union membership have on racial, ethnic and gender pay gaps. First, the penalty associated with living/working in a RTW state could be larger for minorities and women. This effect is captured by estimating separating earnings equations for blacks and whites and men and women, and comparing the RTW coefficients. This is the “RTW Wage” effect.

Another potential effect is the following. RTW laws lower unionization rates, which then dampens the “Union Wage Effect”, which is the union wage premium that workers earn from having access to collective bargaining. The “Total Wage” effect is the sum of the “RTW Wage” effect and the product of the “Union Effect” on wages and the “RTW effect” on union membership. Thus, RTW laws could have disparate impacts in three ways: RTW Wage effect, Union Wage Effect, and RTW Effect on Union membership.

The corrected ACS “state of work” estimates indicate that in the U.S. samples, RTW laws have the largest negative impact on African American men and women. Limiting the sample to the three Midwestern states that recently became RTW suggest that the law has the biggest adverse impact on Latinos. However, it is important to note that the Midwestern estimates are uniformly below the U.S. estimates. The estimates are smaller when the six Midwestern states are only used in the analysis. Why is this the case? Gould and Shierholz (2015) and others think that the adverse wage impacts of RTW laws take time to emerge. The smaller Midwestern estimates may be due to the fact that Indiana, Michigan, and Wisconsin are recent adopters of RTW laws. Further, they are states where organized labor has historically been

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strong, which may have led to greater resistance than seen in the past when the RTW laws were implemented.

Racial, ethnic, and gender wage differences could exist because minorities and women tend to live/work in lower paying RTW states. Thus, when a RTW dummy variable is added to the earnings equation, the estimated racial or gender pay gap would shrink. To explore how RTW laws, union membership, and state-level union density contribute to black-white and Latino-white earnings gaps, I construct Oaxaca-Blinder earnings decompositions. The findings reveal that racial and ethnic differences in RTW exposure explain none of the racial and ethnic earnings gaps among men. The differences in exposure explain a small portion of the earnings gap between black and white women.

Similar to previous studies, racial differences in union membership and state union density help to narrow the black-white earnings gap among men. Depending on the decomposition’s weights, union membership and state union density narrow the black-white gaps by 4.8 to 11.1 percentage points for men, and 1.1 to 3.9 percentage points for women. Ethnic differences in union membership and state-level density explain a portion of the earnings gap between Latino and white men. Union membership at the individual and state level contributes 1.9 to 4.6 percentage points to their over 40.0 percent earnings gap. Among women, racial and ethnic differences in union membership and state union density explain none of the black-white and Latino-white earnings gaps.

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Table 1: Illustration of Misclassification in RTW Status

	State of Work	
State of Residence	Non-RTW	RTW
Non-RTW	Non-RTW, Non-RTW	Non-RTW, RTW
RTW	RTW, Non-RTW	RTW, RTW

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Table 2: 2000 to 2016 CPS Summary Statistics

Panel A: U.S.	U.S. Men		African American Men		Latino Men		U.S. Women		African American Women		Latino Women	
	Non-RTW	RTW	Non-RTW	RTW	Non-RTW	RTW	Non-RTW	RTW	Non-RTW	RTW	Non-RTW	RTW
Log(Real hourly Earnings)	2.98	2.88	2.80	2.68	2.69	2.64	2.85	2.72	2.75	2.61	2.63	2.53
State Union Density (%)	14.2	6.9	13.5	5.9	15.2	6.3	14.1	6.9	13.6	5.8	15.2	6.4
Union = 1	0.159	0.083	0.210	0.095	0.135	0.056	0.152	0.072	0.191	0.069	0.135	0.055
Black = 1	0.069	0.094					0.099	0.138				
Other = 1	0.073	0.041					0.075	0.043				
Latino = 1	0.141	0.155					0.119	0.129				
Age	40.1	39.4	40.2	39.5	37.1	37.0	40.5	40.0	40.6	39.7	37.7	37.8
High School Dropout = 1	0.080	0.097	0.058	0.081	0.317	0.327	0.048	0.056	0.050	0.057	0.201	0.198
High School Graduate = 1	0.296	0.319	0.343	0.398	0.343	0.338	0.233	0.259	0.278	0.299	0.297	0.319
Some College = 1	0.249	0.287	0.305	0.311	0.197	0.201	0.277	0.321	0.331	0.360	0.274	0.272
BA Degree = 1	0.242	0.205	0.193	0.152	0.100	0.098	0.273	0.247	0.207	0.188	0.149	0.155
Advanced Degree = 1	0.133	0.092	0.101	0.059	0.043	0.037	0.168	0.116	0.134	0.096	0.079	0.056
Veteran = 1	0.092	0.108	0.122	0.135	0.043	0.048	0.013	0.017	0.020	0.024	0.008	0.011
Married = 1	0.595	0.611	0.471	0.484	0.561	0.597	0.535	0.555	0.342	0.356	0.479	0.519
Widow = 1	0.005	0.006	0.006	0.008	0.004	0.004	0.018	0.018	0.021	0.023	0.015	0.017
Divorced = 1	0.081	0.095	0.091	0.097	0.057	0.068	0.128	0.147	0.129	0.148	0.113	0.134
Separated = 1	0.017	0.019	0.031	0.040	0.028	0.028	0.027	0.029	0.049	0.051	0.057	0.058
Private = 1	0.855	0.862	0.793	0.834	0.910	0.922	0.794	0.782	0.750	0.761	0.843	0.849
Foreign Born = 1	0.191	0.151	0.203	0.100	0.607	0.589	0.163	0.120	0.172	0.073	0.493	0.476
US Citizen = 1	0.898	0.909	0.914	0.955	0.589	0.587	0.932	0.943	0.935	0.972	0.736	0.731
Central City = 1	0.262	0.224	0.470	0.333	0.418	0.371	0.277	0.228	0.511	0.353	0.431	0.368
Suburb = 1	0.420	0.342	0.376	0.358	0.414	0.364	0.407	0.340	0.352	0.357	0.411	0.389
Rural = 1	0.150	0.226	0.037	0.171	0.055	0.134	0.149	0.224	0.030	0.161	0.047	0.113
Sample Size	254,707	172,862	17,625	16,290	35,804	26,771	212,793	144,201	20,997	19,955	25,265	18,580

Notes: See end of table.

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Table 2 cont.: 2000 to 2016 CPS Summary Statistics

Panel A: Midwestern Variable	Men		African American Men		Latino Men		Midwestern Women		African American Women		Latino Women	
	Non-RTW	RTW	Non-RTW	RTW	Non-RTW	RTW	Non-RTW	RTW	Non-RTW	RTW	Non-RTW	RTW
Log(Real hourly Earnings)	2.94	2.97	2.74	2.72	2.62	2.71	2.80	2.81	2.65	2.70	2.56	2.56
State Union Density (%)	14.1	12.7	14.3	13.3	14.5	12.0	14.1	12.6	14.4	13.4	14.6	12.0
Union = 1	0.172	0.154	0.239	0.227	0.130	0.141	0.146	0.126	0.186	0.167	0.115	0.101
Black = 1	0.064	0.069					0.095	0.110				
Other = 1	0.038	0.033					0.036	0.030				
Latino = 1	0.079	0.066					0.060	0.051				
Age	40.4	38.5	39.8	38.2	36.9	35.8	40.9	38.7	40.4	38.5	37.1	37.0
High School Dropout = 1	0.063	0.065	0.061	0.050	0.332	0.293	0.039	0.035	0.058	0.039	0.217	0.205
High School Graduate = 1	0.308	0.331	0.358	0.424	0.354	0.398	0.247	0.255	0.294	0.295	0.310	0.364
Some College = 1	0.283	0.287	0.325	0.301	0.182	0.191	0.310	0.317	0.360	0.411	0.250	0.241
BA Degree = 1	0.235	0.213	0.170	0.158	0.092	0.065	0.262	0.265	0.176	0.154	0.142	0.148
Advanced Degree = 1	0.111	0.104	0.086	0.066	0.040	0.052	0.142	0.128	0.113	0.101	0.081	0.041
Veteran = 1	0.094	0.075	0.124	0.101	0.043	0.018	0.012	0.012	0.016	0.015	0.008	0.005
Married = 1	0.612	0.595	0.453	0.429	0.587	0.512	0.563	0.541	0.307	0.292	0.523	0.504
Widow = 1	0.005	0.004	0.008	0.003	0.004	0.005	0.018	0.012	0.028	0.021	0.015	0.005
Divorced = 1	0.091	0.100	0.108	0.106	0.057	0.079	0.134	0.141	0.141	0.152	0.101	0.082
Separated = 1	0.014	0.013	0.032	0.032	0.027	0.010	0.021	0.018	0.048	0.032	0.052	0.049
Private = 1	0.885	0.905	0.836	0.888	0.948	0.944	0.825	0.842	0.811	0.852	0.904	0.937
Foreign Born = 1	0.117	0.098	0.136	0.047	0.646	0.609	0.090	0.070	0.082	0.035	0.512	0.436
US Citizen = 1	0.935	0.942	0.938	0.972	0.535	0.535	0.960	0.971	0.965	0.986	0.703	0.723
Central City = 1	0.203	0.207	0.483	0.568	0.390	0.358	0.220	0.216	0.539	0.568	0.399	0.334
Suburb = 1	0.467	0.426	0.394	0.290	0.452	0.309	0.456	0.412	0.369	0.273	0.450	0.342
Rural = 1	0.194	0.186	0.030	0.019	0.097	0.126	0.189	0.186	0.018	0.015	0.087	0.118
Sample Size	49,274	9,195	3,129	634	3,894	611	40,388	7,217	3,817	791	2,424	365

Notes: The data come from the Merged Outgoing Rotation Group files of the 2000 to 2016 Current Population Surveys. A respondent’s state of residence is used to classify whether the individual is in a Non-Right to Work or Right to Work state. To be included in the sample, the respondent must work full-time and have a complete set of information of the above outcomes, union and collective bargaining information, and characteristics. The state union density and state-level right to work designations come from unionstats.com developed by Barry Hirsch and David Macpherson.

**Table 3: 2000 to 2016 Impact of Right-To-Work Status on Men’s Earnings and Union Membership
(RTW Status Defined by Current Population Survey State of Residence)**

Panel A: Men					Union Density Effect on:		Median Log Wage Regression		
Category	RTW Effect on Wages	Union Effect on Wages	RTW on Unionization	Total Wage Impact	Wages	Union Membership	RTW Effect on Wages	Union Effect on Wages	Union Density Effect on Wages
All Men	-0.041 ^a	0.090 ^a	-0.071 ^a	-0.0478 ^a	0.002 ^a	0.054 ^a	-0.041 ^a	0.105 ^a	0.002 ^a
Midwestern Men	-0.025 ^a	0.105 ^a	-0.018	-0.0273 ^a	0.005 ^a	0.045 ^a	-0.015 ^b	0.103 ^a	0.005 ^a
All Black Men	-0.060 ^a	0.088 ^a	-0.056 ^b	-0.0651 ^a	0.001	0.057 ^a	-0.068 ^a	0.107 ^a	0.001
MW Black Men	-0.020	0.086 ^a	0.128 ^c	-0.0088	0.003	0.091 ^a	-0.011	0.101 ^a	0.0001
Latino Men	-0.044 ^a	0.156 ^a	-0.011	-0.0459 ^a	-0.0002	0.059 ^a	-0.041 ^a	0.180 ^a	-0.001 ^b
MW Latino Men	0.018	0.172 ^a	0.097	0.0344	0.002	0.015	-0.001	0.166 ^a	-0.005
Panel B: Women					Union Density Effect on:		Median Log Wage Regression		
Category	RTW Effect on Wages	Union Effect on Wages	RTW on Unionization	Total Wage Impact	Wages	Union Membership	RTW Effect on Wages	Union Effect on Wages	Union Density Effect on Wages
All Women	-0.058 ^a	0.040 ^a	-0.069 ^a	-0.061 ^a	0.003 ^a	0.067 ^a	-0.055 ^a	0.044 ^a	0.004 ^a
MW Women	-0.032 ^a	0.041 ^a	0.033	-0.030 ^a	0.007 ^a	0.092 ^a	-0.021 ^a	0.024 ^a	0.007 ^a
Black Women	-0.101 ^a	0.059 ^a	-0.044 ^c	-0.104 ^a	0.0003	0.070 ^a	-0.111 ^a	0.074 ^a	-0.0002
MW Black Women	0.007	0.087 ^a	-0.059	0.002	0.001	0.110 ^a	0.031	0.081 ^a	-0.002
Latino Women	-0.059 ^a	0.093 ^a	0.046 ^c	-0.055 ^a	0.003 ^a	0.068 ^a	-0.047 ^a	0.116 ^a	0.003 ^a
MW Latino Women	-0.045 ^c	0.077 ^a	0.254 ^b	-0.026	0.002	0.083 ^a	-0.013	0.058 ^b	0.005

Notes: The data come from the Merged Outgoing Rotation Group files of the 2000 to 2016 Current Population Surveys. A respondent’s state of residence is used to classify whether the individual is in a Non-Right to Work or Right to Work state. To be included in the sample, the respondent must work full-time and have a complete set of information of the outcomes, union and collective bargaining information, and characteristics listed in Table 1. The RTW Effect on Wages and the Union Effect on Wages are constructed by the regression of log real hourly wages on union density, an individual’s union membership status, race and ethnicity, age, educational attainment, veteran status, marital status, private sector status, foreign born and U.S. citizen status, and metropolitan residence. The RTW Effect on wages is the estimated coefficient on the RTW dummy variable. The union effect on wages is the coefficient on the union membership dummy variable. The RTW on Unionization effect is the estimated coefficient on the RTW dummy variable from a linear probability model of union status on state union density, race, ethnicity, age, educational attainment, marital status, private sector status, veteran status, U.S. citizenship, foreign born status, metropolitan status, industry of employment and year dummy variables. An “a” indicates that the estimate is not significantly different from zero. A “b” indicates significant at the 5 percent level. A “c” denotes 10 percent level of significance.

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Table 4: 2000 to 2015 Joint Probability Distributions of RTW Status by State of Residence and State of Work

Panel A: Frequency												
	State of Work											
State of Residence	Men		Black Men		Latino Men		Women		Black Women		Latino Women	
U.S.	Non-RTW	RTW	Non-RTW	RTW	Non-RTW	RTW	Non-RTW	RTW	Non-RTW	RTW	Non-RTW	RTW
Non-RTW	1,806,440	15,711	106,971	727	243,770	1,218	1,498,807	7,915	130,589	534	169,859	515
RTW	16,439	1,168,870	1,039	118,546	1,512	182,833	7,872	999,349	704	148,971	601	127,870
Midwestern												
Non-RTW	434,015	5,386	21,393	140	26,323	229	356,410	2,723	27,393	97	17,307	89
RTW	3,041	78,055	133	4,279	184	3,169	1,585	61,670	127	5,145	97	2,085
Panel B: Probability												
	State of Work											
State of Residence	Men		Black Men		Latino Men		Women		Black Women		Latino Women	
U.S.	Non-RTW	RTW	Non-RTW	RTW	Non-RTW	RTW	Non-RTW	RTW	Non-RTW	RTW	Non-RTW	RTW
Non-RTW	0.601	0.005	0.471	0.003	0.568	0.003	0.596	0.003	0.465	0.002	0.568	0.002
RTW	0.005	0.389	0.005	0.522	0.004	0.426	0.003	0.398	0.003	0.531	0.002	0.428
Midwestern												
Non-RTW	0.834	0.010	0.825	0.005	0.880	0.008	0.844	0.006	0.836	0.003	0.884	0.005
RTW	0.006	0.150	0.005	0.165	0.006	0.106	0.004	0.146	0.004	0.157	0.005	0.106
<p>Notes: The data come from the 2000 to 2015 American Community Survey files. Two right to work statuses are constructed. The first links a respondent’s state of residence to the Barry Hirsch and David Macpherson data on a state’s right to work designation. The second links the Hirsch and Macpherson data a respondent’s state of work. To be included in the sample, the respondent must work full-time and have a complete set of information of the outcomes, union and collective bargaining information, and characteristics listed in Table 1. For Midwestern samples, respondents must work in one of the six states: Indiana, Michigan, Minnesota, Illinois, Wisconsin or Ohio. The above entries report the joint frequency and probability distributions associated with living and working in a right to work state. The off-diagonals are the entries of concern. For example, in the U.S. sample, 16,439 men live in a right to work state, but work in a non-right to work state. This represents 0.50 percent of the sample. The other off diagonal indicates that 15,711 respondents live in non-right to work states and work in right to work states. This also corresponds to 0.50 percent of the sample.</p>												

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**Table 5: 2000 to 2015 American Community Survey Mean Log Annual Earnings of Full-Time and Full-Year Respondents
(By Right-to-Work Status Based on State of Residence and Work)**

Panel A: Men	U.S.				Midwestern			
Variable	RTW(SOR)= NO RTW(SOW)=NO	RTW(SOR) = NO RTW(SOW)=YES	RTW(SOR)=YES RTW(SOW)=NO	RTW(SOR)=YES RTW(SOW)=YES	RTW(SOR)= NO RTW(SOW)=NO	RTW(SOR) = NO RTW(SOW)=YES	RTW(SOR)=YES RTW(SOW)=NO	RTW(SOR)=YES RTW(SOW)=YES
U.S. Men	10.70	10.72	10.84	10.57	10.62	10.70	10.82	10.63
U.S. Black Men	10.46	10.47	10.58	10.26	10.32	10.49	10.68	10.32
U.S. Latino Men	10.28	10.34	10.48	10.23	10.24	10.43	10.57	10.28
Panel B: Women								
U.S. Women	10.49	10.43	10.53	10.31	10.39	10.41	10.58	10.37
U.S. Black Women	10.41	10.34	10.43	10.15	10.26	10.33	10.43	10.24
U.S. Latino Women	10.18	10.09	10.26	10.07	10.11	10.14	10.44	10.08

Notes: Entries are the average of the natural logarithm of inflation-adjusted annual earnings for a given pair right to work outcomes. The entry labeled **RTW(SOR)= NO and RTW(SOW)=NO is the average log annual earnings for respondents in the ACS that do not live or work in a right to work state. The column labeled RTW(SOR) = NO and RTW(SOW)=YES corresponds to the average log earnings for respondents that do not live in a right to work state but they work in a right to work state. The column labeled RTW(SOR)=YES and RTW(SOW)=NO measure the average log earnings for respondents that live in a right to work state but do not work in a right to work state. The column labeled RTW(SOR)=YES and RTW(SOW)=YES captures the average log earnings of individuals that live and work in a right to work state.**

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Table 6: 2000 to 2015 ACS Estimates of the Impact of RTW Status on Labor Market Outcomes

Panel A: U.S.				Union Density Effect on:		
Men	RTW Effect on Wages	Union Effect on Wages	RTW on Unionization	Total Wage Impact	Wages	Union Membership
State of Residence	-0.026 ^a	1.310 ^a	0.0001 ^a	-0.026 ^a	0.004 ^a	0.0001 ^a
State of Work	-0.027 ^a	1.101 ^a	0.0002 ^a	-0.027 ^a	0.005 ^a	0.0001 ^a
Women						
State of Residence	-0.051 ^a	-0.483 ^a	-0.0003 ^a	-0.0506 ^a	0.005 ^a	-0.000003
State of Work	-0.050 ^a	-0.422 ^a	-0.0003 ^a	-0.0499 ^a	0.006 ^a	-0.000004
Black Men						
State of Residence	-0.056 ^a	0.898	-0.0001	-0.0562 ^a	0.004 ^a	0.00008 ^a
State of Work	-0.089 ^a	0.661 ^a	-0.0003 ^a	-0.0890 ^a	0.004 ^a	0.00008 ^a
Black Women						
State of Residence	-0.119 ^a	0.025	0.0005 ^a	-0.1188 ^a	0.005 ^a	0.00015 ^a
State of Work	-0.133 ^a	0.086 ^a	0.0004 ^a	-0.1334 ^a	0.004 ^a	0.00015 ^a
Latino Men						
State of Residence	-0.034 ^a	2.419 ^a	0.0006 ^a	-0.064 ^a	0.001	0.00002
State of Work	-0.038 ^a	1.804	0.0007 ^a	-0.056 ^a	0.0002	0.0001 ^b
Latino Women						
State of Residence	-0.040 ^a	0.176 ^a	0.0002 ^c	-0.0396 ^a	0.006 ^a	0.00005 ^a
State of Work	-0.041 ^a	0.115 ^c	0.0002	-0.0408 ^a	0.007 ^a	0.00005 ^a

Notes: The data come from the 2000 to 2015 American Community Survey files. The rows labeled “State of Residence” measure the three RTW impacts using a respondent’s state of residence to classify whether the individual is in a Non-Right to Work or Right to Work state. The rows labeled “State of Work” measure the three RTW impacts using a respondent’s state of work to classify whether the individual is in a Non-Right to Work or Right to Work state. To be included in the sample, the respondent must work full-time and have a complete set of information of the outcomes, union and collective bargaining information, and characteristics listed in Table 1. The RTW Effect on Wages and the Union Effect on Wages are constructed by the regression of log real hourly wages on union density, an individual’s union membership status, race and ethnicity, age, educational attainment, veteran status, marital status, private sector status, foreign born and U.S. citizen status, and metropolitan residence. The RTW Effect on wages is the estimated coefficient on the RTW dummy variable. The union effect on wages is the coefficient on the union membership dummy variable. Since the ACS does not contain a respondent’s union membership status, I use an out of sample prediction model to estimate whether a person is a member of a union. First, I use the union model estimated with the CPS data. Second, I apply those estimated coefficients to the characteristics respondents in the ACS to generate a predicted union membership. I then use these predicted values of union membership as a predictor of a respondent’s wages. The RTW on Unionization effect is the estimated coefficient on the RTW dummy variable from a regression of the predicted union membership status on state union density, race, ethnicity, age, educational attainment, marital status, private sector status, veteran status, U.S. citizenship, foreign born status, metropolitan status, industry of employment and year dummy variables. An “a” indicates that the estimate is not significantly different from zero. A “b” indicates significant at the 5 percent level. A “c” denotes 10 percent level of significance. Let β_1 denote the coefficient for the RTW effect on wages. Let β_2 denote the coefficient on the Union Effect on Wages and let γ_1 denote the coefficient on the RTW on Unionization effect. Let θ equal the Total Wage effect: $\beta_1 + \beta_2 * \gamma_1$. Assuming that β_1 is independent of β_2 and γ_1 , the variance of θ equals $\text{Var}(\beta_1) + \text{Var}(\beta_2 * \gamma_1)$. The first term is just the variance of the coefficient on the RTW Effect on Wages. To construct the variance of the product of β_1 and β_2 , I use the following formula. The $\text{Var}(\beta_2 * \gamma_1)$ equals $\text{Var}(\beta_2)\text{Var}(\gamma_1) + \text{Var}(\beta_2)E^2(\gamma_1) + E^2(\beta_2)\text{Var}(\gamma_1)$. The standard errors range from .0011 for All Midwestern men to .0042 for Midwestern Latino women.

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Table 6 cont.: 2000 to 2015 ACS Estimates of RTW Status on Labor Market Outcomes

Panel B: Midwestern					Union Density Effect on:	
Men	RTW Effect on Wages	Union Effect on Wages	RTW on Unionization	Total Wage Impact	Wages	Union Membership
State of Residence	-0.050 ^a	0.909 ^a	-0.0005 ^a	-0.0501 ^a	0.006 ^a	0.00013 ^a
State of Work	-0.042 ^a	0.802 ^a	-0.0006 ^a	-0.0428 ^a	0.007 ^a	0.00013 ^a
Women						
State of Residence	-0.046 ^a	0.124 ^b	0.0001	-0.0455 ^a	0.008 ^a	-0.00001
State of Work	-0.044 ^a	0.083	0.0001	-0.0438 ^a	0.009 ^a	-0.00001
Black Men						
State of Residence	-0.050 ^a	1.281 ^a	-0.0002	-0.0503 ^a	0.015 ^a	-0.00004
State of Work	-0.027 ^a	0.742 ^a	-0.0001	-0.0268 ^a	0.012 ^a	0.00002
Black Women						
State of Residence	-0.048 ^a	0.743 ^a	-0.0003	-0.0486 ^a	0.010 ^a	0.00007
State of Work	-0.045 ^a	0.321	-0.0003 ^a	-0.0456 ^a	0.012 ^a	0.00005
Latino Men						
State of Residence	-0.066 ^a	2.042 ^a	0.0013 ^a	-0.0637 ^a	0.001	0.00002
State of Work	-0.059 ^a	1.436 ^a	0.0015 ^a	-0.0565 ^a	0.0002	0.00007
Latino Women						
State of Residence	-0.065 ^a	0.323	0.0001	-0.0645 ^a	0.003	0.00013
State of Work	-0.068 ^a	0.293	0.0001	-0.0681 ^a	0.004	0.00013

Notes: The data come from the 2000 to 2015 American Community Survey files. The rows labeled “State of Residence” measure the three RTW impacts using a respondent’s state of residence to classify whether the individual is in a Non-Right to Work or Right to Work state. The rows labeled “State of Work” measure the three RTW impacts using a respondent’s state of work to classify whether the individual is in a Non-Right to Work or Right to Work state. To be included in the sample, the respondent must work full-time and have a complete set of information of the outcomes, union and collective bargaining information, and characteristics listed in Table 1. The RTW Effect on Wages and the Union Effect on Wages are constructed by the regression of log real hourly wages on union density, an individual’s union membership status, race and ethnicity, age, educational attainment, veteran status, marital status, private sector status, foreign born and U.S. citizen status, and metropolitan residence. The RTW Effect on wages is the estimated coefficient on the RTW dummy variable. The union effect on wages is the coefficient on the union membership dummy variable. Since the ACS does not contain a respondent’s union membership status, I use an out of sample prediction model to estimate whether a person is a member of a union. First, I use the union model estimated with the CPS data. Second, I apply those estimated coefficients to the characteristics respondents in the ACS to generate a predicted union membership. I then use these predicted values of union membership as a predictor of a respondent’s wages. The RTW on Unionization effect is the estimated coefficient on the RTW dummy variable from a regression of the predicted union membership status on state union density, race, ethnicity, age, educational attainment, marital status, private sector status, veteran status, U.S. citizenship, foreign born status, metropolitan status, industry of employment and year dummy variables. An “a” indicates that the estimate is not significantly different from zero. A “b” indicates significant at the 5 percent level. A “c” denotes 10 percent level of significance. The standard error for the total impact is equal to the sum of the variance of the RTW effect on wages and the variance of the product of the Union Effect on Wages and RTW effect on Unionization. Let β_1 denote the coefficient for the RTW effect on wages. Let β_2 denote the coefficient on the Union Effect on Wages and let γ_1 denote the coefficient on the RTW on Unionization effect. Let θ equal the Total Wage effect: $\beta_1 + \beta_2 * \gamma_1$. Assuming that β_1 is independent of β_2 and γ_1 , the variance of θ equals $Var(\beta_1) + Var(\beta_2 * \gamma_1)$. The first term is just the variance of the coefficient on the RTW Effect on Wages. To construct the variance of the product of β_1 and β_2 , I use the following formula. The $Var(\beta_2 * \gamma_1)$ equals $Var(\beta_2)Var(\gamma_1) + Var(\beta_2)E^2(\gamma_1) + E^2(\beta_2)Var(\gamma_1)$. The standard errors range from .0019 for All Midwestern men to .0127 for Midwestern Latino women.

Table 7: Summary of RTW Wage Effects by Data Source and State of Residence and Work

Panel A: Men				
	CPS		ACS	
Category	State of Residence	State of Residence	State of Work	
All Men	-0.041 ^a	-0.026 ^a	-0.027 ^a	
All Black Men	-0.060 ^a	-0.056 ^a	-0.089 ^a	
Latino Men	-0.044 ^a	-0.034 ^a	-0.038 ^a	
Midwestern Men	-0.025 ^a	-0.050 ^a	-0.042 ^a	
MW Black Men	-0.020	-0.050 ^a	-0.027 ^a	
MW Latino Men	0.018	-0.066 ^a	-0.059 ^a	
Panel B: Women				
All Women	-0.058 ^a	-0.051 ^a	-0.050 ^a	
Black Women	-0.101 ^a	-0.119 ^a	-0.133 ^a	
Latino Women	-0.059 ^a	-0.040 ^a	-0.041 ^a	
MW Women	-0.032 ^a	-0.046 ^a	-0.044 ^a	
MW Black Women	0.007	-0.048 ^a	-0.045 ^a	
MW Latino Women	-0.045 ^c	-0.065 ^a	-0.068 ^a	
Notes: The CPS estimates are reprinted from Table 2. The ACS estimates are reprinted from Table 6.				

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Table 8: Male ACS Decompositions of Racial and Ethnic Earnings Gaps

Panel A: White-Black	U.S.				Midwestern			
	State of Residence		State of Work		State of Residence		State of work	
Category	WW	BW	WW	BW	WW	BW	WW	BW
Wage Gap	0.459	0.459	0.391	0.391	0.457	0.457	0.341	0.341
Unobservables	0.274	0.300	0.242	0.256	0.344	0.449	0.276	0.322
Observables	0.185	0.159	0.148	0.135	0.113	0.008	0.065	0.019
Right to Work	0.002	0.008	0.003	0.012	0.001	-0.0001	0.000	0.000
Union	-0.018	-0.023	-0.015	-0.019	-0.055	-0.096	-0.048	-0.111
Age	0.016	0.015	0.008	0.007	0.015	0.018	0.004	0.005
Education	0.114	0.113	0.098	0.092	0.077	0.092	0.057	0.069
Marital	0.056	0.044	0.043	0.029	0.069	0.064	0.052	0.040
Private	0.015	0.013	0.015	0.011	0.017	0.025	0.014	0.030
Veteran	0.001	-0.001	0.001	-0.001	0.001	0.0005	0.002	0.001
Immigrant	-0.001	0.001	-0.001	0.006	0.002	0.003	0.002	0.006
Metropolitan	-0.017	-0.019	-0.020	-0.012	-0.034	-0.114	-0.039	-0.037
Industry	0.018	0.009	0.017	0.010	0.023	0.016	0.022	0.017
Year	-0.001	-0.001	-0.001	-0.001	-0.002	-0.001	-0.002	-0.002
Panel B: White-Latino								
Category	WW	BW	WW	BW	WW	BW	WW	BW
Wage Gap	0.479	0.479	0.492	0.492	0.419	0.419	0.420	0.420
Unobservables	0.150	0.159	0.191	0.146	0.099	0.181	0.134	0.140
Observables	0.329	0.321	0.301	0.346	0.320	0.238	0.287	0.280
Right to Work	0.001	0.001	0.001	0.002	-0.003	-0.001	-0.002	-0.001
Union	0.024	0.059	0.019	0.046	0.022	0.072	0.018	0.061
Age	0.067	0.031	0.064	0.033	0.067	0.040	0.065	0.040
Education	0.233	0.201	0.216	0.194	0.198	0.172	0.181	0.164
Marital	0.029	0.019	0.026	0.017	0.031	0.018	0.028	0.015
Private	-0.016	-0.031	-0.014	-0.024	-0.015	-0.035	-0.013	-0.029
Veteran	-0.003	0.005	-0.002	0.004	-0.004	0.001	-0.003	-0.0002
Immigrant	-0.009	0.014	-0.005	0.048	0.022	-0.020	0.020	0.024
Metropolitan	-0.024	-0.007	-0.025	0.002	-0.028	-0.028	-0.030	-0.014
Industry	0.029	0.029	0.024	0.026	0.033	0.023	0.028	0.024
Year	-0.002	-0.002	-0.002	-0.003	-0.004	-0.003	-0.004	-0.003
<p>Notes: The data come from the 2000 to 2015 American Community Survey files. Each column contains the decomposition of the overall wage gap, the difference in the log average wages between white and black men, and white and Latino men. Each row corresponds to a characteristic’s contribution to the wage gap. A positive entry indicates that that feature contributes to the wage gap. A negative entry indicates the feature helps to narrow the gap between white and black men, and white and Latino men. The table presents decompositions that utilize each racial/ethnic group’s coefficients as the weights (e.g., WW: White weights, BW: Black weights). The columns labeled “State of Residence” refer to decompositions where a respondent’s state of residence classifies whether the individual is in a Non-Right to Work or Right to Work state. The columns labeled “State of Work” correspond to decompositions where a respondent’s state of work classifies whether the individual is in a Non-Right to Work or Right to Work state. The union component is the sum of the union membership and state-level density effects. See Table 6 for a description of how the union membership component is constructed.</p>								

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Table 8 cont.: Female ACS Decompositions of Racial and Ethnic Earnings Gaps

Panel A: White-Black	U.S.				Midwestern			
	State of Residence		State of Work		State of Residence		State of work	
Category	WW	BW	WW	BW	WW	BW	WW	BW
Wage Gap	0.224	0.224	0.209	0.209	0.198	0.198	0.154	0.154
Unobservables	0.128	0.125	0.124	0.117	0.162	0.193	0.133	0.137
Observables	0.096	0.098	0.085	0.092	0.036	0.005	0.021	0.017
Right to Work	0.006	0.017	0.006	0.018	0.001	0.0004	0.0003	0.0003
Union	0.008	-0.006	0.011	-0.004	-0.017	-0.051	-0.011	-0.039
Age	0.007	0.007	0.005	0.005	0.013	0.014	0.008	0.008
Education	0.087	0.083	0.077	0.075	0.059	0.063	0.046	0.047
Marital	0.023	0.022	0.022	0.020	0.033	0.032	0.032	0.029
Private	-0.002	0.003	-0.004	0.003	0.0005	0.008	-0.001	0.005
Veteran	0.0002	-0.001	-0.0001	-0.0006	0.0002	0.0001	0.0002	-0.0001
Immigrant	0.003	-0.0002	0.003	0.001	0.003	0.0002	0.003	0.001
Metropolitan	-0.030	-0.021	-0.030	-0.020	-0.051	-0.062	-0.051	-0.036
Industry	-0.006	-0.007	-0.005	-0.005	-0.005	0.002	-0.003	0.002
Year	-0.0002	-0.0002	-0.0004	-0.0003	-0.001	-0.001	-0.001	-0.001
Panel B: White - Latino								
Category	WW	BW	WW	BW	WW	BW	WW	BW
Wage Gap	0.360	0.360	0.346	0.346	0.326	0.326	0.302	0.302
Unobservables	0.099	0.082	0.118	0.079	0.064	0.071	0.079	0.055
Observables	0.261	0.279	0.228	0.267	0.262	0.255	0.223	0.246
Right to Work	0.001	0.001	0.002	0.002	-0.003	-0.002	-0.003	-0.003
Union	-0.002	-0.0004	-0.004	-0.002	0.000	0.004	-0.003	0.002
Age	0.062	0.046	0.057	0.043	0.075	0.069	0.065	0.058
Education	0.186	0.161	0.168	0.150	0.167	0.136	0.148	0.124
Marital	0.011	0.008	0.011	0.009	0.014	0.008	0.014	0.008
Private	0.002	0.002	0.003	0.003	-0.001	-0.005	0.002	-0.002
Veteran	-0.0001	0.0002	0.00002	0.0003	-0.0001	0.0002	-0.0001	0.0002
Immigrant	0.026	0.062	0.022	0.068	0.047	0.061	0.044	0.069
Metropolitan	-0.039	-0.023	-0.039	-0.021	-0.038	-0.031	-0.038	-0.021
Industry	0.015	0.025	0.010	0.018	0.004	0.020	-0.002	0.014
Year	-0.003	-0.003	-0.003	-0.003	-0.005	-0.004	-0.005	-0.004

Notes: The data come from the 2000 to 2015 American Community Survey files. Each column contains the decomposition of the overall wage gap, the difference in the log average wages between white and black women, and white and Latino women. Each row corresponds to a characteristic’s contribution to the wage gap. A positive entry indicates that that feature contributes to the wage gap. A negative entry indicates the feature helps to narrow the gap between white and black men, and white and Latino men. The table presents decompositions that utilize each racial/ethnic group’s coefficients as the weights (e.g., WW: White weights, BW: Black weights). The columns labeled “State of Residence” refer to decompositions where a respondent’s state of residence classifies whether the individual is in a Non-Right to Work or Right to Work state. The columns labeled “State of Work” correspond to decompositions where a respondent’s state of work classifies whether the individual is in a Non-Right to Work or Right to Work state. The union component is the sum of the union membership an and state-level density effects. See Table 6 for a description of how the union membership component is constructed.

ENDNOTES

¹ See, <http://www.epi.org/preemption-map/>.

² In Missouri, anti-right to work groups were able to collect enough signatures and block the laws August 2017 implementation. Voters will decide the laws fate in the November 2018 election.

³ Unionization has historically provided a wage advantage to all workers and a variety of studies have shown that racial differences in union membership can explain the black-white wage gap. For example, Bound and Freeman (1992) document the effect of declining unionization on wage losses among black men during the 1980s. More recently, Wilson and Rodgers (2016) conclude that declining unionization contributes to the black-white wage gap’s expansion, particularly for men newly joining the workforce. Between 1983 and 2015, the years for which the CPS data on union membership by race are available, the black-white wage gap grew 1.6 percent among new-entrant men and 3.0 percent among experienced men. The erosion in union membership and state union density accounts for about one-fourth to one-fifth of this growth, regardless of experience. Among new-entrant men, a drop in the higher wage earned by those covered by a collective bargaining contract accounts for 43 percent of the total growth in the men’s racial wage gap; among experienced men it accounts for one-third.

⁴ They obtain a union wage premium of 11.7 to 12.9 percent. This is the wage advantage associated with being a member of a union.

⁵ See, www.unionstats.com.

⁶ Metro status is used to distinguish people who live in a metropolitan statistical area (MSA), as identified by the Census Bureau, from those who don’t. This allows us to account for the fact that wages are typically higher in urban or metro areas than in rural areas.

⁷ To compute the percent change or percent difference in earnings between RTW and non-RTW workers, I use the formula: $100 * (\exp(\beta) - 1)$.

⁸ The summary statistics in Table 1 are similar to Gould and Shierholz (2015). The union membership in RTW states for their study is 2.4 times that in non-RTW states. Table 1 shows the ratio to be around 2.0.

⁹ I exclude respondents that live in one of the six states but work outside the six states. These respondents could either work in a right to work state or a non-right to work state.

¹⁰ It is important to note that respondents that live in the six states, but work outside of them have been excluded. These are respondents that could work in either a RTW or non-RTW state. I also exclude respondents that live outside the six Midwestern states, but work in one of them.

¹¹ Appendix Table 1 reports the summary statistics for each of the four state of residence and state categories. The estimates are quite similar to previous studies. For example, the ratio of the union membership measures in RTW and non-RTW states is 2.4 for men and women, identical to what Gould and Shierholz (2015) find.