



The Impact of “Right-to-Work” Laws on Labor Market Outcomes in Three Midwest States: Evidence from Indiana, Michigan, and Wisconsin (2010–2016)

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EXECUTIVE SUMMARY

The movement to implement “right-to-work” (RTW) legislation has accelerated over recent years. Since 2012, RTW laws have been passed in Indiana, Michigan, Wisconsin, West Virginia, Kentucky, and Missouri. This report investigates the impact of RTW laws passed in three Midwest states for which there is available data – Indiana, Michigan, and Wisconsin – compared to a control group of three Midwest counterparts that remained collective-bargaining (CB) states – Illinois, Minnesota, and Ohio – from January 2010 through December 2016.

As of 2016, there were significant differences between the two groups of states:

- Workers in Indiana, Michigan, and Wisconsin earned 8.0 percent less per hour on average than their counterparts in Illinois, Minnesota, and Ohio. The median worker earned 5.9 percent less.
- The union membership rate was 11.5 percent in Indiana, Michigan, and Wisconsin compared to 13.7 percent in Illinois, Minnesota, and Ohio.
- The unemployment rate was 4.9 percent in Indiana, Michigan, and Wisconsin, marginally lower than the 5.1 percent rate in Illinois, Minnesota, and Ohio.

These economic indicators could be due to many factors other than whether a state enacted a RTW law. Educational attainment, demographics, the higher cost of living in urban areas, occupation and industry of employment, and other regional trends could all influence outcomes. Thus, statistical analyses are performed to determine the independent effect that RTW laws have had on labor markets in the Midwest.

In Indiana, Michigan, and Wisconsin, the introduction of RTW laws has statistically reduced the unionization rate by 2.1 percentage points on average and lowered real hourly wages by a total of 2.6 percent on average.

RTW laws have varying impacts on worker wages depending on occupation. On average, RTW legislation has statistically reduced the hourly wages of:

- Construction and extraction workers by 5.9 percent.
- Workers in service occupations, including police officers and firefighters, by 3.1 percent.
- Workers in office and administrative support roles by 2.7 percent.
- Employees in retail and business sales by 2.4 percent.
- Professional, educational, and health workers by 1.9 percent.
- Modest gains for production workers of 0.3 percent were found but likely the result of increased unionization due to auto bailout.

Similarly, the adverse impact of RTW on hourly wages has been largest for workers with levels of educational attainment that typically provide pathways into the middle class in the Midwest:

- RTW has lowered the wages of low-skilled workers with high school degrees or less by 0.4 percent;
- RTW has decreased the wages of workers with bachelor's degrees, with associate's degrees, and with some college experience by between 3.1 percent and 3.3 percent;
- RTW has had no effect on the wages of workers with Master's degrees or with professional or doctorate degrees.

Based on data over recent years, RTW has had particularly negative consequences for many middle-class workers in Indiana, Michigan, and Wisconsin. These include working-class Americans in construction, protective services, office support jobs, and those with two- and four-year college degrees.

Lawmakers in other states that are debating the merits of passing "right-to-work" laws should consider these research findings. Between 2010 and 2016, the enactment of "right-to-work" legislation reduced unionization and resulted in lower hourly earnings on average in states across the Midwest. Ultimately, "right-to-work" laws have had negative consequences for many workers in Indiana, Michigan, and Wisconsin.

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INTRODUCTION

A “right-to-work” (RTW) law is a government regulation which prohibits workers and employers from including union security clauses into privately-negotiated contracts. Union security clauses ensure that all workers who benefit from collective bargaining pay a fair share of dues or fees for the services provided. RTW makes the payment of dues or fees optional, allowing workers in any bargaining unit to “free ride” on the efforts and contributions of others. Consequently, workers can benefit from higher wages, better health and retirement benefits, legal and grievance representation, and other perks earned by the union without paying anything for the services provided.

When a significant number of individuals make the decision to “free ride,” the financial resources of a labor union become depleted. This causes the union to underperform, because unions spend the vast majority of their resources on bargaining, representing workers, and organizing new members. For example, unions in Illinois spend 77 percent of all dues and fees on bargaining and representation and just 2 percent on political activities and lobbying, according to federal reports ([Manzo & Bruno, 2016](#)). Often, RTW’s drain on financial resources can be so significant that unions lose the ability to retain or recruit members; sometimes, unions close their doors altogether. As a result, research shows that RTW reduces the union membership rate by between 5 and 10 percentage points ([Manzo & Bruno, 2014](#); [Hogler et al., 2004](#); [Moore, 1980](#)) while also increasing free-riding by 8 percentage points ([Davis & Huston, 1993](#)).

By reducing unionization, RTW has helped to redistribute income from workers to owners. Economic studies consistently show that RTW reduces worker earnings by between 2 percent and 4 percent on average ([Gould & Kimball, 2015](#); [Manzo & Bruno, 2014](#); [Gould & Shierholz, 2011](#)). The laws have also been found to reduce the wages of nonunion workers by 3 percent ([Lafer, 2011](#)).

Furthermore, Stevans used an advanced statistical analysis to find that worker wages and per capita income are both lower, on average, in states with RTW laws. He concludes that RTW lowers wages by 2 percent but increases owner income by 2 percent, indicating that the law results in a transfer of income from workers to owners with “little ‘trickle-down’ to the largely non-unionized workforce in these states” ([Stevans, 2009](#)). The share of the economy captured by workers through employee compensation is higher in states without RTW laws, while the share of the economy captured by capital through owner income, corporate profits, machinery, and transfer payments is higher in states with RTW laws ([Manzo & Bruno, 2014](#)). Meanwhile, the evidence regarding RTW’s impact on employment is mixed ([Collins, 2014](#); [Eren & Ozbeklik, 2011](#); [Stevans, 2009](#)).

Despite these research findings, the movement to implement “right-to-work” laws has accelerated. Right-to-work laws became effective in February 2012 in Indiana, March 2013 in Michigan, March 2015 in Wisconsin, May 2016 in West Virginia, and January 2017 in Kentucky. In 2017, Missouri also passed legislation to become a RTW state starting on August 28, 2017 ([NRTWC, 2017](#)). RTW bills have also been introduced in states as diverse as Ohio ([Borchardt, 2017](#)), Colorado ([Sealover, 2017](#)), and New Hampshire ([Morris, 2017](#)). Finally, President Trump reportedly supports RTW and Congressman Steve King, a Republican from Iowa, has introduced legislation to make RTW a nationwide law ([Adams Otis, 2017](#)).

This Research Report, conducted by researchers at the Illinois Economic Policy Institute and the University of Illinois at Urbana-Champaign, investigates the impact of “right-to-work” laws passed in Midwest states. High-quality economic research on RTW requires many years of data to assess impacts. Thus, the analysis is limited to effects in Indiana, Michigan, and Wisconsin compared to a control group of three Midwest states which remained non-

RTW, or collective-bargaining (CB) states: Illinois, Minnesota, and Ohio. The period of analysis is from January 2010 through December 2016.

DATA, METHODOLOGY, AND LIMITATIONS

This study focuses on the specific question of how much the enactment of “right-to-work” laws changed three labor market outcomes— union membership, worker wages per hour, and the unemployment rate— in the Midwest. In this analysis, RTW is assumed to have no effect on each of the three outcomes unless statistical analyses provide enough evidence otherwise.

This analysis focuses on labor markets in six Midwest states over the period from 2010 through 2016. Note that the national economy experienced a continuous upswing in the business cycle while rebounding from the Great Recession during this timeframe. Indiana, Michigan, and Wisconsin all enacted a RTW policy during the period of analysis, providing a regional experiment on the effects of RTW laws. Three states – Illinois, Minnesota, and Ohio – were selected to serve as a comparison group because they did not have RTW laws at the beginning of the period of analysis and still do not have RTW laws today. The point is to assess the economic outcomes of three states that were not RTW but became RTW (“the treatment group”) against those in three similar states that were not RTW and remained so (“the control group”). Thus, states that previously had RTW, such as

Iowa, were not included in the analysis. This report exclusively uses data from the *Current Population Survey Outgoing Rotation Groups (CPS ORG)*, which is collected, analyzed, and released by the U.S. Department of Labor Bureau of Labor Statistics. The *Current Population Survey* is the survey of households that provides the data for the Department of Labor to release monthly data on the unemployment rate. The seven-year dataset from 2010 through 2016 comprises information on 299,144 individuals aged 16 to 85 in Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin, including 179,160 persons employed in one or more jobs. Analytic weights are provided by the Department of Labor to adjust the sample to the actual population 16 years of age or older in each state.

This study analyzes data using advanced statistical analyses called “regressions.” Regressions are used to parse out the actual and unique impact that certain variables – such as a RTW law or being a union member – have on wages and labor market outcomes. The technique describes how much the variable is responsible for raising or lowering worker wages, after accounting for all other observable factors. Probabilistic regressions are also utilized to determine the average effect of RTW on union membership and the unemployment rate. A “Heckman correction,” a two-step statistical approach, is applied to the regressions when appropriate. Basically, there are a number of factors that influence whether an individual is employed or not working, including educational and demographic

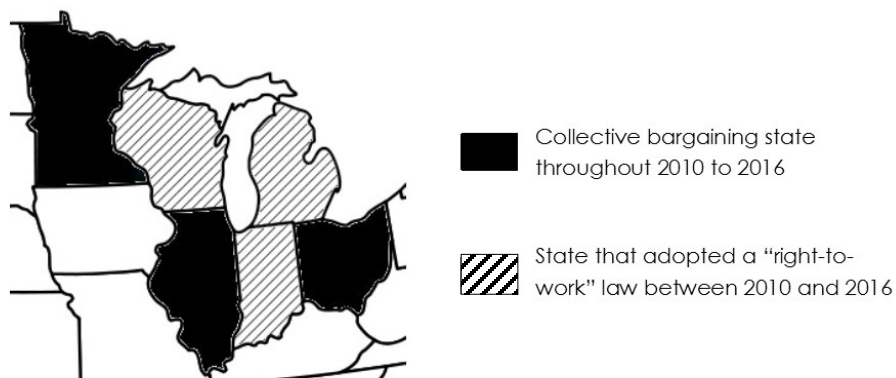


Figure 1: Map of State Included in this Analysis - States that Became RTW vs. Control Group of CB States

factors. The Heckman correction controls for the type of people who become workers for various reasons before estimating the impact of RTW laws and union membership on those workers.

There are limitations to this analysis. First, data from the *Current Population Survey* report a worker's state of residence rather than state of employment, so the results may be biased by workers who live in RTW states but work in CB states (e.g., living in Indiana but working in Illinois) and vice-versa. The data is also based on household survey responses rather than on administrative payroll reports, so there may be more potential for human error. The final concerns are those associated with all regression models, such as lurking and unobservable variables.

REPORT FINDINGS

Before evaluating the independent effect of “right-to-work” (RTW) laws on economic outcomes in these Midwest states, it may be useful to compare recent data on the three RTW states to their three collective-bargaining (CB) counterparts (Figure 2). As of 2016, workers in Indiana, Michigan, and Wisconsin earned lower wages than workers in Illinois, Minnesota, and Ohio. The average worker in a RTW state earned 8.0 percent less per hour than the average worker in a CB state. Similarly, the median worker earned 5.9 percent less. The union membership rate was 11.5 percent in the three RTW states, 2.2 percentage points below the 13.7 percent rate in the three CB states. The only economic indicator for which the three RTW states had a better record than the three comparison CB states is the unemployment rate, which was 0.3

percentage-point lower in the three RTW states (Figure 2).

While important, these economic indicators could be the result of many factors other than whether a state enacted a RTW law. Factors that could influence these labor market outcomes for a particular individual include, but are not limited to, educational attainment, age, gender, racial or ethnic identification, citizenship status, nationality, urban status, veteran status, marital status, occupation of employment, industry of employment, and regional trends. The remainder of this report accounts for these factors to determine the unique and independent impact that “right-to-work” laws and union membership have on workers.

UNION MEMBERSHIP

The overall union membership rate has generally fallen faster in the three states that became RTW than in the three CB states. Figure 3 presents data comparing the change in union membership for each RTW state since enacting the law to the simultaneous change in union membership for Illinois, Minnesota, and Ohio. Michigan, for example, enacted its law in March 2013. From the beginning of 2013 to the end of 2016, the unionization rate in Michigan fell by 2.2 percentage points. By contrast, the unionization rate in the three CB states fell by only 0.1 percentage point. Wisconsin experienced a substantial 3.5 percentage-point drop in unionization after becoming a RTW state, a 3.3 percentage-point decrease versus the 0.2 percentage-point drop among the three CB counterparts. However, the one exception has been Indiana, which has experienced a 0.8 percentage-point

Economic Indicator	Three Collective-Bargaining States: IL, MN, OH	Three “Right-to-Work” States: IN, MI, WI	RTW State vs. CB State
Average wage	\$24.29	\$22.34	-8.03%
Median wage	\$19.00	\$17.88	-5.92%
Unionization rate	13.66%	11.50%	-2.17 points
Unemployment rate	5.11%	4.85%	-0.26 point

Figure 2: Economic Indicators, Three CB States vs. Three RTW States in the Midwest, 2016

Source: Authors’ analysis of the *Current Population Survey Outgoing Rotation Groups* (CEPR, 2017) for employed persons in 2016. The full dataset includes 299,144 observations, with 37,993 respondents in 2016. Observations are weighted to match the overall population

Unionization Rate Change	Indiana (RTW)	Michigan (RTW)	Wisconsin (RTW)	Three Collective-Bargaining States	RTW State vs. Three CB States
2012-2016	-0.84%			-1.26%	+0.42%
2013-2016		-2.15%		-0.10%	-2.05%
2015-2016			-3.54%	-0.22%	-3.32%

Figure 3: Change in State Unionization Rates, Each RTW State vs. Three CB States, Since RTW Enactment

Source: Authors' analysis of the Current Population Survey Outgoing Rotation Groups (CEPR, 2017) for employed persons from 2010 through 2016. The full dataset includes 299,144 observations, including 179,160 employed persons. Observations are weighted to match the overall population.

decline in union density since it became a RTW state. While significant, this drop in the union membership rate was smaller than the comparable decline among the three CB states (1.3 percentage points) (Figure 3).

Many factors influence the unionization rate and an individual worker's likelihood of being a union member. These range from occupational factors (i.e., construction workers are more likely to be in a union than physicists) to racial factors (i.e., African-American workers are more likely to join a union than white workers). After accounting for these and other observable variables, the introduction of RTW laws in the Midwest has decreased the probability that a worker is a member of a labor union by 2.1 percentage points on average (Figure 4). Thus, between 2010 and 2016, "right-to-work" laws have reduced the unionization rate of Midwest states adopting the policy by 2.1 percentage points on average.

Unionization Rate	Marginal Effect
Right-to-Work Law	-2.09%***
R ²	0.243

Figure 5: The Impact of RTW on the Probability of Being a Union Member, Heckman Probit Results, 2010-2016

***Statistically significant at the 1% level; **statistically significant at the 5% level, *statistically significant at the 10% level.

Source: Authors' analysis of the Current Population Survey Outgoing Rotation Groups (CEPR, 2017) for employed persons from 2010 through 2016. The full dataset includes 299,144 observations, including 179,160 employed persons. Observations are weighted to match the overall population. For example regression analyses, please see the Appendix. For full regression results, please email author Frank Manzo IV at fmanzo@illinoisepi.org

Average Real Wage Change	Indiana (RTW)	Michigan (RTW)	Wisconsin (RTW)	Three Collective-Bargaining States	RTW State vs. Three CB States
2012-2016	+2.31%			+7.79%	-5.48%
2013-2016		+2.65%		+6.45%	-3.80%
2015-2016			+2.29%	+7.84%	-5.56%

Figure 4: Change in Average Real Wages, Each RTW State vs. Three CB States, Since RTW Enactment

Source: Authors' analysis of the Current Population Survey Outgoing Rotation Groups (CEPR, 2017) for employed persons from 2010 through 2016. The full dataset includes 299,144 observations, including 179,160 employed persons. Observations are weighted to match the overall population.

WORKER WAGES

Worker wages have grown faster in Illinois, Minnesota, and Ohio than in the three Midwest states that adopted a RTW law between 2012 and 2016. Figure 5 shows the growth in real wages for each RTW state since it enacted the law versus to the comparable growth among the three CB states. Real wages are the hourly incomes of workers adjusted for inflation by the Consumer Price Index (CPI-U). Across the board, the data reveal that average worker wages have increased more in the three CB states than in the three RTW states. Compared to Illinois, Minnesota, and Ohio, inflation-adjusted wages have grown 5.5 percentage-points slower in Indiana since the state enacted RTW. Growth in average worker wages in Michigan has been 3.8 percentage points below the CB state average since Michigan adopted its RTW law. Most significantly, in the year following RTW implementation, real hourly wages in Wisconsin improved by 2.3 percent. Inflation-adjusted wages in nearby CB states, however, increased by 7.8 percent on average, a 5.6 percentage-point difference after rounding (Figure 5).

The story is similar when comparing inflation-adjusted median hourly wages (Figure 6). Important for estimating impacts on middle-class workers, the median wage is the midpoint hourly income where half of the workers earned less the specified dollar value and the other half earned more than

Median Real Wage Change	Indiana (RTW)	Michigan (RTW)	Wisconsin (RTW)	Three Collective-Bargaining States	RTW State vs. Three CB States
2012-2016	+1.18%			+5.78%	-4.60%
2013-2016		+2.77%		+5.39%	-2.62%
2015-2016			+0.57%	+6.32%	-5.75%

Figure 6: Change in Median Worker Wage, Each RTW State vs. Three CB States, Since RTW Enactment

Source: Authors' analysis of the Current Population Survey Outgoing Rotation Groups (CEPR, 2017) for employed persons from 2010 through 2016. The full dataset includes 299,144 observations, including 179,160 employed persons. Observations are weighted to match the overall population.

this level. From the year their state enacted a RTW law, the median workers in Indiana, Michigan, and Wisconsin respectively saw their wages decline by 4.6 percentage points, 2.6 percentage points, and 5.8 percentage points per hour *relative* to their middle-class counterpart in the three CB states. Thus, while real median incomes have recently experienced their fastest annual wage growth in decades, middle-class workers in these three new RTW states in the Midwest may be being left behind ([Proctor et al., 2016](#)).

After accounting for observable factors in a regression analysis with Heckman selection for the types of workers who are employed, RTW is found to have lowered real hourly wages by 2.3 percent on average for all workers in the Midwest states adopting the law (Figure 7). This 2.3 percent estimated reduction in worker earnings due to RTW corroborates previous research that tends to find an effect between -2 percent and -4 percent. However, because statistical results reported in Figure 4 revealed that RTW also reduced union membership by 2.1 percentage points in these states, it is important to also consider the independent impact that union membership has on worker wages (the "union wage effect"). Across the region, union membership raises a worker's hourly wage by 11.4 percent on average after controlling for other factors. This parallels estimates from numerous other studies ([Manzo et al., 2016](#); [Mishel, 2012](#); [Schmitt, 2008](#); [Hirsch & Macpherson, 2006](#)).

Accounting for this interaction means that RTW laws have actually lowered worker wages by 2.6 percent on average in the three Midwest states that adopted them since 2012. The independent RTW effect is a 2.3 percent drop in wages, which affects all workers. But the 2.1 percentage-point drop

in unionization impacts union members and those who are most likely to join labor unions. This drop in the unionization rate is multiplied by the average union wage premium – what these workers would have earned on average with a collective bargaining agreement – and added to the effect on all workers. Mathematically, these impacts result in a 2.6 percent total loss in average worker earnings due to the RTW law.

Furthermore, a quantile regression technique was used to assess the impact of RTW and union membership on the median worker in these six Midwest states. Note that the quantile regression does not allow researchers to conduct a two-step analysis controlling for characteristics that determine whether a person is employed. Nevertheless, the analysis finds that RTW laws have lowered inflation-adjusted median wages by 1.6 percent in the three states that implemented the policy. By contrast, union membership is clearly more effective at lifting middle-class worker incomes, statistically increasing the median wage by 11.0 percent across all six states (Figure 7).

Real Wages	Effect on Average	Effect on Median
Right-to-Work Law	-2.33%***	-1.61%***
Union Member	+11.39%***	+11.01%***
R ²	0.459	0.318

Figure 7: The Impact of RTW on Real Wages, Average from Heckman Regression, Median from Quantile Regression, 2010-2016

***Statistically significant at the 1% level; **statistically significant at the 5% level, *statistically significant at the 10% level.

Source: Authors' analysis of the Current Population Survey Outgoing Rotation Groups (CEPR, 2017) for employed persons from 2010 through 2016. The full dataset includes 299,144 observations, including 179,160 employed persons. Observations are weighted to match the overall population. For example regression analyses, please see the Appendix. For full regression results, please email author Frank Manzo IV at fmanzo@illinoisepi.org.

Similar evaluations targeting workers in specific occupations and at differing levels of educational attainment yield interesting results (Figure 8). After accounting for other observable factors, the total effect of RTW on construction and extraction workers is a 5.9 percent reduction in hourly wages on average. This is the most pronounced impact on a group of workers by occupational classification. RTW has also reduced the hourly wages of service workers – including police officers and firefighters – by 3.1 percent on average in Indiana, Michigan, and Wisconsin. RTW resulted in wages that were 2.7 percent lower for those in office and administrative support roles, 2.4 percent lower for employees in retail and business sales occupations, and 1.9 percent lower for professional, educational, and health workers. With one exception, RTW has had either no statistical impact or smaller effects

on all other occupations in Indiana, Michigan, and Wisconsin.

The data indicate that RTW has had a slight positive impact on wages for production workers in these three states. In previous research analyzing ten years of national data in the early 2000s, researchers from the University of Illinois at Urbana-Champaign and the University of Michigan estimated that RTW lowers manufacturing worker earnings by up to 9 percent (Manzo et al., 2013). These mixed findings could mean that the current RTW effect on production workers is only temporary in the region. Additionally, the revitalization of the auto industry with fiscal stimulus from the Obama administration may have played a role in this outcome, particularly in Michigan and Indiana. This revival was not included as a factor in the statistical analysis but may have been a “lurking variable,” especially

Group of Workers Analyzed: Real Wages	Total RTW Impact: Wage and Union Effects
All workers	-2.56%
<u>Occupations</u>	
Construction and extraction	-5.87%
Services (including police and fire)	-3.07%
Office and administrative support	-2.71%
Retail and business sales	-2.40%
Professional, educational, and health	-1.86%
Transportation and material moving	-0.78%
Installation, maintenance, and repair	-0.58%
Management, business, and financial	No effect
Farming, fishing, and forestry	No effect
Production	+0.25%
<u>Educational Attainment</u>	
Less than a high school degree	-0.39%
High school degree or equivalent	-0.35%
Some college, no degree	-3.25%
Associate’s degree	-3.24%
Bachelor’s degree	-3.13%
Master’s degree	No effect
Professional or doctorate degree	No effect

Figure 8: The Impact of RTW on Real Wages, By Occupation and Educational Attainment, Robust Regression Results, 2010-2016
Unless denoted by “No effect,” all impacts are significant at the 1% level or the 5% level. The coefficients of determination (R²) range from .048 to .326.

Source: Authors’ analysis of the Current Population Survey Outgoing Rotation Groups (CEPR, 2017) for employed persons from 2010 through 2016. The full dataset includes 299,144 observations, including 179,160 employed persons. Observations are weighted to match the overall population. For example regression analyses, please see the Appendix. For full regression results, please email author Frank Manzo IV at fmanzo@illinoisepi.org.

since the reported effect is due entirely to the gain in union membership among production workers in the three RTW states relative to the three CB states (see Appendix Table B). In sum, this effect is an outlier to an otherwise consistent finding that RTW lowers wages for the average worker, the median worker, and all occupational classifications.

The adverse effect of RTW on hourly wages has been largest for workers with levels of educational attainment that typically provide pathways into the middle class in the Midwest (Figure 8). RTW laws had no statistical impact on the wages of workers with Master's degrees or with professional or doctorate degrees. For low-skilled workers with high school degrees or less, the introduction of RTW laws reduced hourly wages by approximately 0.4 percent in Indiana, Michigan, and Wisconsin. However, RTW has caused a 3.1 percent to 3.3 percent decline in average hourly wages among workers with bachelor's degrees, with associate's degrees, and with some college experience relative to their counterparts in the three CB states. Based on data over recent years, RTW has had particularly negative consequences for many middle-class workers in Indiana, Michigan, and Wisconsin, including construction and extraction workers, police officers, firefighters, and those with two- and four-year degrees.

UNEMPLOYMENT RATE

While RTW laws have statistically reduced both the unionization rate and average worker wages, they have also been correlated with lower unemployment rates in the Midwest (Figure 9). Comparing

Midwest states that became RTW to their three CB counterparts reveals that the unemployment rate has fallen by between 0.5 percentage points and 2.2 percentage points more post-RTW in the states that enacted the law.

Michigan stands out in particular, because the unemployment rate has fallen by 4.8 percentage points since Michigan's RTW law went into effect. This compares favorably to a drop of just 2.5 percentage points among the three CB states from 2013 through 2016 (Figure 9). However, it is worth noting that Michigan had a noticeably high unemployment rate at the time of enactment. Michigan's unemployment rate in the previous year, 2012, was 9.6 percent, while the aggregate rate for the three CB states was 7.6 percent. As of 2016, the unemployment rates were essentially equivalent: Michigan's unemployment rate was 4.9 percent while the three CB states experienced a 5.1 percent unemployment rate.

After controlling for demographic, educational, and geographic factors, statistical analysis implies that RTW laws have been associated with a larger annual decline in a state's unemployment rate (Figure 10). The unemployment rate of RTW states statistically declined by 1.2 percentage point per year on average compared to a 0.9 percentage-point average annual drop in CB states. Thus, the independent effect of RTW has been a 0.3 percentage-point decrease in Midwest unemployment annually over recent years. Note, however, that the coefficient of determination (or R^2) is 0.08 on this regression. Statistically, this means that 92 percent of the change is explained by factors or policy changes *other than* the

Unemployment Rate Change	Indiana (RTW)	Michigan (RTW)	Wisconsin (RTW)	Three Collective-Bargaining States	RTW State vs. Three CB States
2012-2016	-4.10%			-3.58%	-0.52%
2013-2016		-4.75%		-2.52%	-2.23%
2015-2016			-1.72%	-0.83%	-0.89%

Figure 9: Change in State Unemployment Rates, Each RTW State vs. Three CB States, Since RTW Enactment

Source: Authors' analysis of the Current Population Survey Outgoing Rotation Groups (CEPR, 2017) for employed persons from 2010 through 2016. The full dataset includes 299,144 observations, including 179,160 employed persons. Observations are weighted to match the overall population.

variables included in the regression, including RTW. These impacts on unemployment should therefore be taken with a grain of salt. The evidence suggests that RTW contributed to lower unemployment rates in Indiana, Michigan, and Wisconsin– but the data are weaker than the hourly wage and union membership results.

Annual Unemployment Change	Independent Effect
Right-to-work law	-1.20%***
No right-to-work law	-0.88%***
R ²	0.077

Figure 10: The Impact of RTW on the Probability of a Labor Force Participant Being Unemployed, Probit Results, 2010-2016

***Statistically significant at the 1% level; **statistically significant at the 5% level, *statistically significant at the 10% level.

Source: Authors' analysis of the Current Population Survey Outgoing Rotation Groups (CEPR, 2017) for employed persons from 2010 through 2016. The full dataset includes 299,144 observations, including 179,160 employed persons. Observations are weighted to match the overall population. For example regression analyses, please see the Appendix. For full regression results, please email author Frank Manzo IV at fmanzo@illinoisepi.org.

RTW on hourly wages has also been largest for workers with levels of educational attainment that typically provide pathways into the middle class in the Midwest, decreasing the wages of individuals with two- and four-year college degrees by between 3.1 percent and 3.3 percent;

Lawmakers in other states that are debating the merits of passing “right-to-work” laws should consider these research findings. Between 2010 and 2016, the enactment of “right-to-work” legislation reduced unionization and resulted in lower hourly earnings on average in states across the Midwest. Ultimately, “right-to-work” laws have had negative consequences for many workers in Indiana, Michigan, and Wisconsin.

CONCLUSION

This report has evaluated the impact of “right-to-work” (RTW) laws passed in three Midwest states compared to a control group of three Midwest counterparts that remained collective-bargaining (CB) states from January 2010 through December 2016. In Indiana, Michigan, and Wisconsin, the introduction of RTW laws has statistically reduced the unionization rate by 2.1 percentage points and lowered real hourly wages by a total of 2.6 percent, while having only a weak effect on the unemployment rate.

“Right-to-work” laws have also had varying impacts on worker wages depending on occupation and educational attainment. On average, RTW has statistically reduced the hourly wages of construction and extraction workers by 5.9 percent, workers in service occupations by 3.1 percent, and workers in office and administrative support roles by 2.7 percent. The adverse impact of

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Appendix

Table A: Example Regressions of Impact of RTW on Labor Market Outcomes, 2010-2016 – See Figures 7 and 4

Variable	<u>ln(Real Wage): Two-Step Heckman Regression</u>		<u>ln(Real Wage): Quantile Regression – Median</u>		<u>Probability of Being a Union Member: Heckprobit</u>	
	Coefficient	(St. Err.)	Coefficient	(St. Err.)	dy/dx AME ¹	(St. Err.)
RTW law	-0.0237***	(0.0001)	-0.0161***	(0.0001)	-0.0209***	(0.0001)
Union member	0.1139***	(0.0001)	0.1101***	(0.0002)		
Age	0.0574***	(0.0000)	0.0319***	(0.0000)	0.0070***	(0.0000)
Age ²	-0.0006***	(0.0000)	-0.0003***	(0.0000)	-0.0001***	(0.0000)
White, non-Latino	0.1121***	(0.0005)	0.0660***	(0.0006)	0.0222***	(0.0003)
African American	-0.0352***	(0.0005)	-0.0187***	(0.0006)	0.0547***	(0.0003)
Latino or Latina	0.0784***	(0.0005)	0.0137***	(0.0006)	0.0318***	(0.0003)
Asian	0.1020***	(0.0006)	0.1039***	(0.0006)	-0.0050***	(0.0004)
Female	-0.1825***	(0.0001)	-0.1303***	(0.0001)	-0.0086***	(0.0001)
Veteran	-0.0241***	(0.0002)	0.0103***	(0.0002)	0.0061***	(0.0001)
Married	0.0788***	(0.0001)	0.0710***	(0.0001)	0.0061***	(0.0001)
U.S. citizen	0.0647***	(0.0003)	0.0607***	(0.0003)	0.0363***	(0.0002)
Foreign-born	-0.0590***	(0.0002)	-0.0641***	(0.0003)	-0.0102***	(0.0001)
Less than high school degree	-0.2111***	(0.0002)	-0.0763***	(0.0002)	-0.0201***	(0.0001)
Some college, no degree	0.0532***	(0.0001)	0.0355***	(0.0001)	0.0076***	(0.0001)
Associate's degree	0.1465***	(0.0002)	0.1016***	(0.0002)	0.0144***	(0.0001)
Bachelor's degree	0.3435***	(0.0001)	0.2938***	(0.0001)	0.0025***	(0.0001)
Master's degree	0.4765***	(0.0002)	0.4168***	(0.0002)	0.0417***	(0.0001)
Professional/doctorate degree	0.5394***	(0.0003)	0.5640***	(0.0003)	-0.0508***	(0.0002)
Lives in city center	0.0173***	(0.0001)	0.0229***	(0.0002)	-0.0098***	(0.0001)
Lives in suburb	0.0563***	(0.0001)	0.0550***	(0.0001)	-0.0127***	(0.0001)
Live in rural area	-0.0421***	(0.0001)	-0.0421***	(0.0002)	-0.0343***	(0.0001)
Works for federal government	0.0360***	(0.0003)	0.0688***	(0.0004)	0.1397***	(0.0002)
Works for state government	-0.0951***	(0.0002)	-0.0878***	(0.0003)	0.1693***	(0.0002)
Works for local government	-0.0958***	(0.0002)	-0.1026***	(0.0002)	0.1982***	(0.0002)
Usual hours worked per week	0.0055***	(0.0000)	0.0071***	(0.0000)	0.0016***	(0.0000)
Occupation dummies (9)	Y		Y		Y	
Industry dummies (12)	Y		Y		Y	
Year dummies (6)	Y		Y		Y	
Constant	0.8007***	(0.0009)	1.3949***	(0.0010)	0.1211***	(0.0001)
R ² or [Prob > chi ²]	[0.0000]		0.3183		[0.0000]	
Observations	250,721		135,541		251,167	
Weighted	Y		Y		Y	
Two-step selection:	P(Employed)		None		P(Employed)	

***Statistically significant at the 1% level; **statistically significant at the 5% level, *statistically significant at the 10% level.

¹dy/dx AME is the “average marginal effect” or “average partial effect.” Probit regressions report the (positive or negative) direction of the effect that a factor has on the binary variable of interest and it is statistically significant. AMEs are used to determine the magnitude of statistically significant factors.

Source: Authors' analysis of the Current Population Survey Outgoing Rotation Groups (CEPR, 2017) for employed persons from 2010 through 2016. The full dataset includes 299,144 observations, including 179,160 employed persons. Observations are weighted to match the overall population. For full and complete regression results, please email author Frank Manzo IV at fmanzo@illinoisepi.org.

Table B: The Impact of RTW on Real Wages, By Occupation and Educational Attainment, Robust Regression Results, 2010-2016 – See Figure 8

Group of Workers Analyzed: Real Wages	RTW Effect on Wages	+ Union Effect on Wages	x RTW Effect on Unionization	= Total Wage Impact
All workers	-2.33%	+11.39%	-2.09%	-2.56%
<u>Occupations</u>				
Construction and extraction	-3.91%	+29.80%	-6.58%	-5.87%
Services (including police and fire)	-2.28%	+18.58%	-4.23%	-3.07%
Office and administrative support	-2.60%	+7.61%	-1.43%	-2.71%
Retail and business sales	-2.40%	No effect	No effect	-2.40%
Professional, educational, and health	-1.65%	+6.64%	-3.22%	-1.86%
Transportation and material moving	No effect	+21.34%	-3.64%	-0.78%
Installation, maintenance, and repair	No effect	+20.63%	-2.81%	-0.58%
Management, business, and financial	No effect	No effect	No effect	No effect
Farming, fishing, and forestry	No effect	No effect	No effect	No effect
Production	No effect	+14.91%	+1.69%	+0.25%
<u>Educational Attainment</u>				
Less than a high school degree	No effect	+16.34%	-2.40%	-0.39%
High school degree or equivalent	No effect	+15.29%	-2.31%	-0.35%
Some college, no degree	-3.02%	+12.71%	-1.79%	-3.25%
Associate's degree	-3.02%	+12.24%	-1.80%	-3.24%
Bachelor's degree	-2.98%	+8.25%	-1.89%	-3.13%
Master's degree	No effect	+7.98%	No effect	No effect
Professional or doctorate degree	No effect	No effect	No effect	No effect

***Statistically significant at the 1% level; **statistically significant at the 5% level, *statistically significant at the 10% level.

Source: Authors' analysis of the Current Population Survey Outgoing Rotation Groups (CEPR, 2017) for employed persons from 2010 through 2016. The full dataset includes 299,144 observations, including 179,160 employed persons. Observations are weighted to match the overall population. For full and complete regression results, please email author Frank Manzo IV at fmanzo@illinoisepi.org.