

Milestone1

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Introduction

In US labor policies, an union security agreement is an agreement between an employer and a labor union. They agree to what extent employees have to join the labor union and/or if the employers will collect fees for this participation [1].

The rationale behind union security agreement is that forming the union and negotiating with the employer may cost a lot of money, and the benefit from this can also come to the non-union member [2].

In that case, the employees may not want to be part of the union, and it won't have enough money to negotiate efficiently and will eventually collapse. In that case, situation for all employees will be worse. Union security agreement are a way to ensure that all employee pay their fair share. [2]

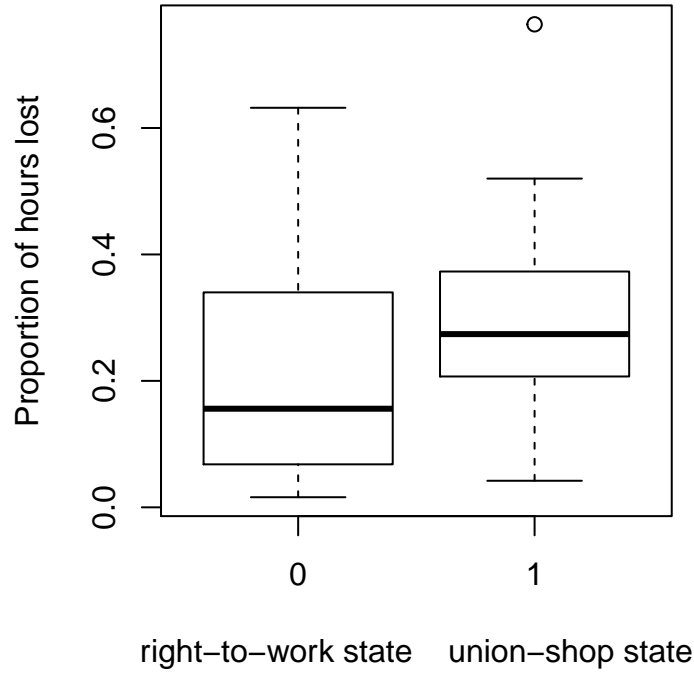
In some cases, employees may be forced to join labor unions as a condition for hiring, and to pay for representation [3] Right-to-work laws prohibit such union security agreements [4]. It is adopted in some states, called « Right-to-work states », and not in others, called « union-shop states ».

A major claim to justify the usefulness of right-to-work law is that work hours lost in stoppages in some states were lessened thanks to the law. [5]

The purpose of this study is to assess whether this statement is true, and if there is any correlation between right-to-work laws and industrial conflict.

First analysis

A first step in our study is to compare work hours lost in stoppages in right-to-work states and union shop-states. We can observe the difference of distribution on the following plot.

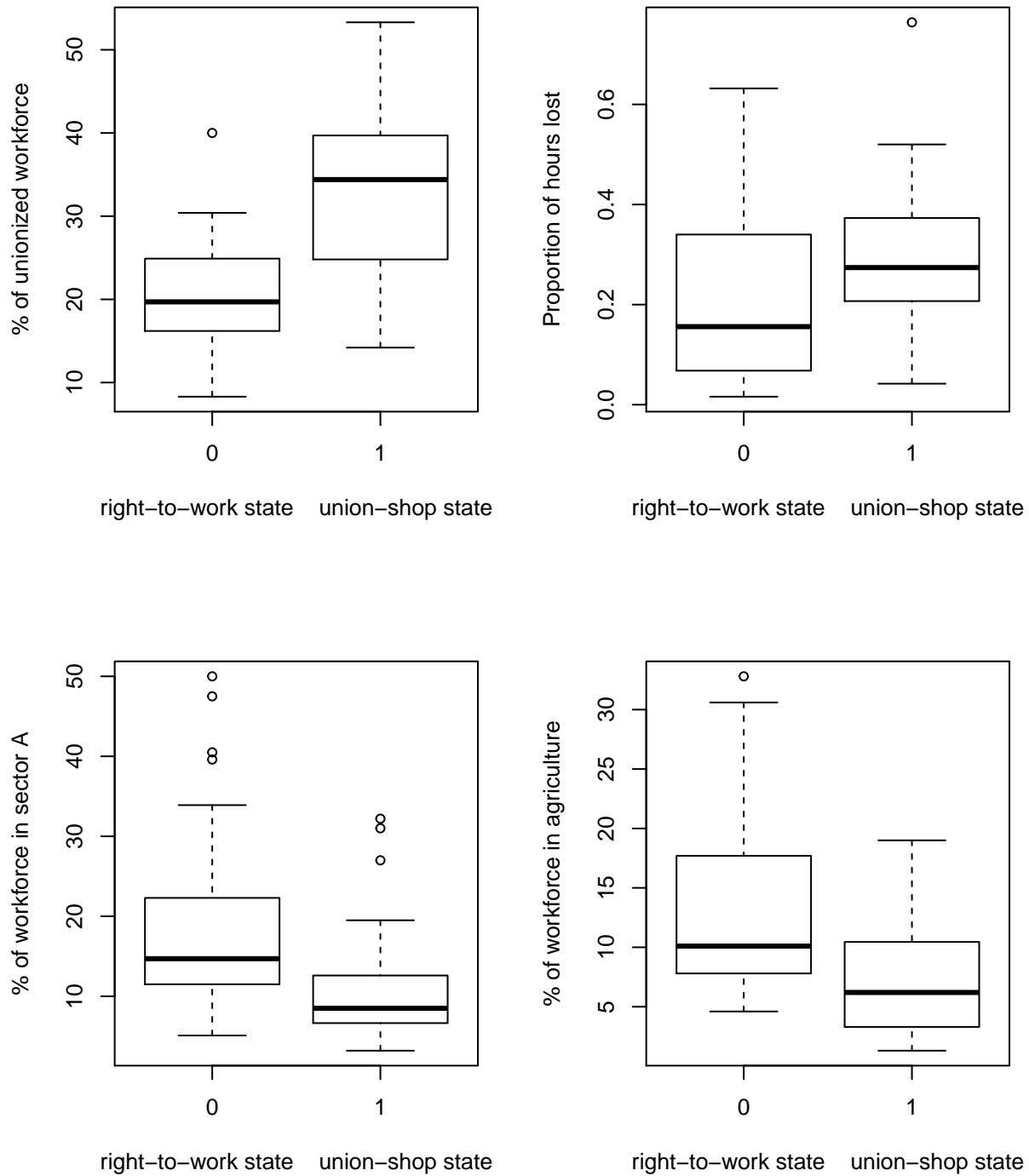


After a t-test we find that there is no statistical significant that the two means are different.

We will perform a multiple linear regression to try to find any correlation between right-to-work law and industrial conflict. Therefore we will use factors that vary between the two categories of states.

The parameters

We consider other variables that differ between right-to-work state and union-shop states, to see if there is a causative effect on the level of industrial conflict.



Unionization degree means is different between the two type of state at the 0.1% level of significance. Indeed, it is logical to think that unionization is higher in forced-union state. And unionization might have a correlation for more industrial conflict. Sector A regroup relatively non-unionized industry, such as food, textile and apparel. Right-to-work states

seem to have more « Sector A » workers (means are different at the 5% significance level). Dispersion of union strength could cause less stoppages. Agriculture seems more present in the right-to-work state (means different at the 1% level of significance) and might be a factor for less stoppages, because it is a relatively non-unionized industry.

The regression

We want to find if the right to work laws are directly correlated with hours lost. For this we compare two linear models with ANOVA. One uses all data and the other is missing the dummy variable.

We do an F-Test to compare variances :

```
##
## F test to compare two variances
##
## data: conflict.lmfull and conflict.lmmiss
## F = 0.99728, num df = 43, denom df = 44, p-value = 0.9938
## alternative hypothesis: true ratio of variances is not equal to 1
## 95 percent confidence interval:
##  0.546671 1.823154
## sample estimates:
## ratio of variances
##          0.9972811
```

Adding the dummy variable does not reduce variance in the model in a statistically significant way. We use this to conclude that controlling for the other factors right to work laws have no influence on hours lost due to conflict.

We do F-tests on every coefficient in the full model :

```
## Single term deletions
##
## Model:
## Data$yearly_conflict ~ Data$Union_degree + Data$Sector_A_workers +
##   Data$Ag_forces + Data$dummy
##           Df Sum of Sq      RSS      AIC F value    Pr(>F)
## <none>                0.97540 -177.01
## Data$Union_degree      1    0.32915 1.30456 -165.06 14.5104 0.0004382 ***
## Data$Sector_A_workers  1    0.01364 0.98905 -178.35  0.6015 0.4422500
## Data$Ag_forces         1    0.00160 0.97700 -178.93  0.0704 0.7920033
## Data$dummy             1    0.02540 1.00081 -177.78  1.1200 0.2958370
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

We observe that only unionization has sufficiently small p values to reject the null hypothesis that unionization and industrial conflict have no correlation to 0.001 significance level. More importantly, this statistical study does not let us conclude that there is any correlation between right-to-work law and industrial conflict.

References

- [1] Pynes, Joan. Human Resources Management for Public and Nonprofit Organizations. 2d ed. Hoboken, N.J.: John Wiley and Sons, 2004. ISBN 0-7879-7078-6
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- [3] Baird, Charles W. "Right to work before and after 14 (b)." Journal of Labor Research 19.3 (1998): 471-493.
- [4] "Employer/Union Rights and Obligations". National Labor Relations Board. Retrieved July 7, 2017.
- [5] Right to Work National Newsletter, Vol. 10, No. 1 (Jan. 27, 1964), p. 4 and Chamber of Commerce of the United States, Exposed: Union Myths A bout Right-to-Work Laws, 1964, p. 14. 5U.S. Bureau of Labor