The Causal Effect of Labor Unions
In The U.S. Context

John DiNardo
Outline

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A Research Design Perspective

My focus is very narrow – the U.S. (mostly), industrial unions (mostly). I have used a number of research designs and my personal evaluations:

<table>
<thead>
<tr>
<th>Research Design</th>
<th>How “Good is it”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross Section</td>
<td>Minimally OK at best</td>
</tr>
<tr>
<td>Panel Data</td>
<td>Minimally OK but maybe better than cross-section</td>
</tr>
<tr>
<td>Before–After Design with</td>
<td>A little better?</td>
</tr>
<tr>
<td>a “control group”</td>
<td></td>
</tr>
<tr>
<td>Regression Discontinuity</td>
<td>Best</td>
</tr>
</tbody>
</table>
### The Puzzle

<table>
<thead>
<tr>
<th>Research Design</th>
<th>Estimated Wage Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross Section</td>
<td>10% – 40%</td>
</tr>
<tr>
<td>Panel Data</td>
<td>10% – 40%</td>
</tr>
<tr>
<td>Before–After Design with a “control group”</td>
<td>10% – 40%</td>
</tr>
<tr>
<td>Regression Discontinuity</td>
<td>-2 to 0 percent(^1)</td>
</tr>
<tr>
<td>DiNardo and Lee (2004)</td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) With enough precision to easily rule out a 5 percent wage gain after 4-7 years following the election

One of these is not like the others!
There are lots of ways to resolve the puzzle.


2. Every published estimate except DiNardo and Lee (2004) is unbiased.

3. There are easy ways to reconcile such estimates. I would like to treat both DiNardo and Lee (2004) and the others – “ceteris paribus” comparisons – seriously.

4. One immediate problem is that the interpretation of the “ceteris paribus” estimates are unclear because they are not specific about the “manipulation” (as in “No Causation Without Manipulation.”)

5. The ceteris paribus estimates are not merely a chimera but estimate a different (but also interesting) parameter.

6. The conclusions aren’t particularly unique.
A Research Design Perspective

My Resolution

**Research Design**
- Experiment or Intervention
- Who Knows?
- A person lucky enough to get a union job. A firm effect. But where do the unionized jobs come from?

**Cross Section**
- Regression Discontinuity
- Obvious. The effect of unionizing a single establishment.

**Panel Data**
- Before–After Design with a “control group”
In The “Beginning”

The “modern”/“textbook” labor economics approach is as old as “supply and demand” and predates Alfred Marshall’s development of the demand curve. Jenkin (1868) and Jenkin (1870):
In The “Beginning”

1. In Mankiw’s Macroeconomics (1997), for example, this picture is used to explain the existence of unemployment (The complete list also includes minimum wage legislation and efficiency wages under the rubric real–wage rigidity)

2. Jenkin (1868), ironically, reviews and rejects Mankiw-like arguments except for unimportant and very “local” situations.

3. Jenkin concludes (like Adam Smith) that (subject to some constraints, like protection for “knobsticks”) unions are a good thing – they raise wages but don’t create unemployment.

4. He concludes the problem is a misunderstanding about “demand” and “supply.” What affects the number of workers who are “willing” to “supply their labor” at a given price?
1. Although the unit of observation that would seem to be the most appropriate would be the establishment (Pencavel 1994, Freeman and Kleiner 1999) the focus has been on individual level data.

2. Pre-H. Gregg Lewis’ landmark review, Friedman (1950) argued that industrial unions in the main had no effects on either wages or employment. If they couldn’t affect the supply of labor they couldn’t do anything. They mainly existed to take credit for things that would have taken place anyway.

3. Lewis (1963) moved the U.S. consensus to the view that union wage gap was on average 15 percent.
Motive but not Method

1. Although with little empirical evidence, Freeman and Medoff (1984) argued on the basis of the overwhelming evidence of union wage differentials that the employment effects must be small, essentially on the basis of Jenkin’s original diagram.

2. Some dissent on the basis that something like the “efficient contracts” model argued that unions didn’t merely raise wages but acted as a way to transfer “rents” from capitalists to workers.
Types of Individual Estimates


*Excluding ‘macro’ estimates, which are known to be contaminated by “extent–of–unionism” effects and have now thankfully been superseded by estimates on individual data, Lewis reviews three kinds of union wage effects . . .

- OLS earnings regressions on individual, cross–section data . . .
- panel studies . . .
- simultaneous equation studies . . .

. . . [with these latter two studies representing essentially] attempts to solve [the problem] of ‘omitted–variables’ bias.
What “Ceteris” is Paribus?

1. U.S. developments on the econometrics have been impressive, but focused for (understandable) reasons on trying to estimate increasingly complicated variants of:

2. \( E[w_i(1) - w_i(0)] \)

3. ATE, LATE, MTE, PRTE, etc.

Although generally not “quasi – experimental” a prodigious effort spent on compelling attempts to satisfy “ceteris paribus” conditions.
Many, Many, Compelling Ceteris Paribus Comparisons

- Ashenfelter (1978) who constructs control groups based on industry, race, and worker type (i.e. craftsmen, operatives, laborers)
- Freeman (1984) who compares wage rates for the same individual at different points in time. At one point in time the worker is in a unionized job at a different point in time the worker is in a non-unionized job.
- Lemieux (1998) compares wage rates for the same individual who holds two jobs, one of which is unionized, the other which is not.
- Krashinsky (2004) compares wage rates of identical twins one who is unionized and one who is not.
- Card (1992) who constructs control groups based on observable characteristics which tend to receive the same wage in the non-union sector as well as controlling for differences in permanent characteristics (i.e. person-specific fixed effects)
Union Wage Gaps – Always 15% – 40%
Interpretation Problem

Ceteris paribus seems to be satisfied, but the problem is,

What is the experiment?
In the U.S. the right of workers (not previously “unionized”) in an private sector establishment (not a firm or industry) to bargain collectively usually happens as the result of a process which results in workers voting in a secret ballot election.

If fifty–percent plus 1 workers vote in favor the union, the workers have won the right to bargain collectively. In two papers DiNardo and Lee (2002), DiNardo and Lee (2004), we analyze the experiment that comes from this process for the period 1984-2001.

This is how most establishment became unionized since the end of World War II became to unionized.
<table>
<thead>
<tr>
<th>Establishment and Election Outcomes and Characteristics</th>
<th>N</th>
<th>Full Sample</th>
<th>Union Loss</th>
<th>Union Win</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survival (Indicator Variable), 2001</td>
<td>27622</td>
<td>0.417</td>
<td>0.430</td>
<td>0.400</td>
<td>-0.030</td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td>(0.004)</td>
<td>(0.005)</td>
<td>(0.006)</td>
<td></td>
</tr>
<tr>
<td>Employment, 2001</td>
<td>26355</td>
<td>83.4</td>
<td>88.3</td>
<td>76.8</td>
<td>-11.5</td>
</tr>
<tr>
<td></td>
<td>(1.7)</td>
<td>(2.2)</td>
<td>(2.7)</td>
<td>(3.5)</td>
<td></td>
</tr>
<tr>
<td>Log of Employment, 2001</td>
<td>10265</td>
<td>4.42</td>
<td>4.51</td>
<td>4.30</td>
<td>-0.22</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.03)</td>
<td></td>
</tr>
<tr>
<td>Sales Volume, 2001</td>
<td>25719</td>
<td>14225</td>
<td>16250</td>
<td>11501</td>
<td>-4750</td>
</tr>
<tr>
<td></td>
<td>(321)</td>
<td>(454)</td>
<td>(441)</td>
<td>(633)</td>
<td></td>
</tr>
<tr>
<td>Log of Sales Volume, 2001</td>
<td>9629</td>
<td>9.34</td>
<td>9.48</td>
<td>9.14</td>
<td>-0.35</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.03)</td>
<td>(0.04)</td>
<td></td>
</tr>
</tbody>
</table>

Note: Standard errors in parentheses. Details of the merged data from the NLRB, FMCS, and InfoUSA are in the Data Appendix.

Rows 2 and 4 impute 0 for non-surviving establishments (some data are missing for surviving establishments). Rows 6 and 7 contain only the establishments that survive to the year 2001. Presence of Union post-election (pre-election) indicates whether or not a union at the location of the establishment filed a contract expiration between the election date and 2001 (between the beginning of the FMCS data and the date of the election).
1. The NLRB is often described as an important “beginning”, but in some ways was it “the end” (Freeman 1998). More on this later.

2. For example, striker replacement de facto legal since 1938 (Mackay decision)

3. Employer under no requirement except to “bargain in good faith.” No legal mechanism to “force” employer to change his/her behavior in any way.

4. With later legislation, essentially limited legal union organizing effectively to “one (or a few) establishments at a time.”

5. No election is actually required. (Eaton and Kriesky 2001, Budd and Heinz 1996)
A “bizarre provision” (McCulloch and Bornstein 1974) in the law creating the National Labor Relations Board (NLRB) (the body that conducts union recognition elections) is that it must refrain from employing “individuals for the purpose of . . . economic analysis”!¹

The law also creates “laboratory conditions” for our experiment.

¹The history of the provision is obscure, but may have to do with allegations of “communist” influence. (Gross 1974, McCulloch and Bornstein 1974)
This reality comes close to an “ideal” randomized controlled trial for those firms who have a probability of facing a ”close” vote.

Two sets of otherwise similar firms – one by chance becomes unionized, the other one, by chance, is not.

Plenty of over–identification tests – all pass.
The Picture

Plot $E[\text{Outcome} | \text{Vote Share} = \text{specific value}]$

If plot is smooth through 50%, there is no effect. If plot “jumps” at 50 percent, the vertical height at the 50% vote share is the causal effect.
Idealized Regression Discontinuity
No Effect or “Balanced Covariates”
Idealized Regression Discontinuity

Causal Effect
What is identified by the experiment?

- $B_0$: Law Prohibits Unions
- $B_M$: Law Allows Unions, No Election
- $B_N$: Law Allows Unions, Election Held, Union Loses
- $B_U$: Law Allows Unions, Election Held, Union Wins

Vote Share (How Workers Would Vote)

Bargaining Power of Workers

Direct Impact

Indirect Impact (Threat)

Impact of Permitting Unions

50%
The Experiment is Relevant

Theoretical Relation Between Employer Outcome and Vote Share

Union Vote Share

Percent

InfoUSA sample

LRD sample
There is a Clear Discontinuity

Union Recognition, 0.994 (0.001)

Fraction Voting For Union vs. Probability Union is Recognized
In general, the answer is No if the world looks like a variant of Jenkin's picture where “above market” rates lead to establishment failure.

1. To make this clear, suppose the experiment was randomly allow a subset of workplaces where the union would win a vote if it conducted.

2. In principle, you would like to compare the wages at those plants where unions were allowed to those where they were not.

3. Further suppose unions “kill the goose that lays the golden egg.”
4. If that is true, you are only able to estimate the effect of unionization on survival. You couldn’t estimate a wage effect because the remaining unionized firms would be a selected example (you might be able to bound the wage premium.)

5. **You can only look at the treatment effect on wages if firms have no impact on survival.**
“Fortunately”, No Effect on Survival
No Effect on Output

The graph depicts the relationship between Union Vote Share and Log(Output/Hour) over a range of values for Union Vote Share. The graph shows two lines:

1. The open circles represent Pre-Election data.
2. The filled circles represent Post-Election data.

Additionally, there is a line with triangles representing Post-Election minus Pre-Election Mean. The x-axis represents Union Vote Share, while the y-axis represents Log(Output/Hour) and De-meaned Log(Output/hour) for the Pre-Election and Post-Election data.
No Effect On Wages

Figure IXb: Log(Production Hourly Wage), Pre- and Post-Election, by Union Vote Share, LRD

De-meaned Log(Wage), election and post-election periods, see note to Figure VIII.
What we should have expected to see with a 15% differential

Figure IXb: Log(Production Hourly Wage), Pre- and Post-Election, by Union Vote Share, LRD

Post-Election and post-election periods, see note to Figure VIII.
No effects on:

1. Establishment survival
2. Sales
3. Productivity
4. Total man-hours
5. etc.
6. Wages
Did We Have the Most Salient Experiment

- Arguably yes – at least since the end of World War II.
- Over significant business opposition, unions were “allowed” to organize under NLRB regime.
Sidenote: Are Unions Less Popular Now
How Did Unions Organize Before World War II

Most unionization before World War II was far less voluntary.
Recognition Without Elections or even “Card Checks”

1. To take one example, for two of the “Big Three” automakers, there was no election. Henry Ford “allowed” an election whose outcome was certain in advance (except maybe to him!)

2. How did the unions do it?

UAW – General Motors
UAW – Ford
A Little Help from World War II
and less help from the NLRB

World War II may have “helped” prevent a quick “slide back” to pre–existing expectations. (Freeman 1998)
NLRB Elections Were Never a Large Fraction of Workers

![Graph showing the vote for union in NLRB elections and the new union members as a fraction of employed workers over the years from 1950 to 2005. The graph indicates a significant decline in the vote for union in NLRB elections starting in the 1960s, with a notable increase in the 1990s and 2000s. The number of newly represented employees as a share of the workforce also shows a decline and slight increase over the same period.]
Threat Effects

1. NLRB elections aren’t/weren’t a serious threat.
2. When we tried assessing whether wages rise in response to an election, even when the union eventually loses the point estimates are small and statistically insignificant, ruling out, for example, a 3 percent union wage “threat” effect, 3 years after the election.
3. Perhaps of the action is with “threat” effects but not of the type usual envisioned.
4. What affects “the willingness to supply labor” at a given wage?
5. Why has “voluntary recognition” or card–check become more common? (Schmitt and Zipperer 2007) To minimize “cost” of organizing.
Has Management Opposition Technology Gotten Better?

Pro-Union Workers Fired During Campaign

Year


Unadjusted

Adjusted for Card Check

In Percent

0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0
Lots of Theories

- The traditional models are fragile – (Jenkin 1870, Manning 1994) “Putty–Clay” versus “Putty – Putty.” Other models:
- Acemoglu and Robinson (2000) — Why Did the West Extend the Franchise?
- How to put these propositions to a “severe” test?
Some Conclusions

1. The effect of unions organizing a single establishment is zero in terms of wages, productivity, etc. that the firm must pay. (May have other effects – working on these.)
2. One way to think about conventional “ceteris paribus” union wage effects is that they are “contaminated” by a “firm” or “industry” fixed effect.
3. But where do these fixed effects come from?
4. Labor Unions?


References III


References IV


