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Critical Analysis of Policy Research

FINAL PAPER

INTRODUCTION

Minimum wage policy is among the most contentious topics in economics. When Card and Kreuger published *Myth and Measurement* in 1995, in which they used econometric methods to argue that there are cases in which minimum wage hikes did not lead to decreased employment, the field erupted. Neoclassical economic theory asserts that when the price of a good, in this case labor, is artificially increased in a competitive market, the equilibrium supply of that good, in this case employment, must necessarily decrease. Economics Nobel laureate James Buchanan wrote in the Wall Street Journal that Card and Kreuger had fundamentally "undermine[d] the credibility of economics as a discipline."

In more recent years, minimum wage conversations and policy have been much more flexible than classical economic orthodoxy instructs. In 2009, US federal minimum wage was raised to $7.25 after decades of it decreasing in real terms (Bossler, Gerner 5). In the UK, conservative chancellor George Osborne announced in July 15 that the federal minimum wage would increase from £ 6.50 to £ 9 by 2020. Perhaps most impactfully, Germany decided to introduce its first ever federal minimum wage of € 8.50 on January 1, 2015. Prior to this policy, employer associations and strong unions bargained over sectoral minimum wages. As union density and and collective bargaining power have decreased over the past decades, the need for Germany to adopt a federal statutory minimum wage became clear (Bossler, Gerner 5).

Germany offers a unique context in which to study minimum wage policy because it's one of the only industrialized Western nations to offer such a policy so late and because the law is very comprehensive. There are very few strategies for employers to exempt the policy, which led to an employer-reported applicability rate of 98 percent (Bossler, Gerner 6). In this paper, I will be reviewing and critiquing *Employment effects of the new German minimum wage: Evidence from establishment-level micro data*, an IAB discussion paper by Bossler, Mario and Gerner, Hans-Dieter.

DATA

The dataset used in this analysis is the IAB (Institute for Employment Research) Establishment Panel – a large annual survey of firms in Germany. The data includes around 15,000 firms and is representative of German establishments across geography, industry, and size. A firm is eligible to be included in the survey if it has at least one regular employee liable to social security (Bossler, Gerner 11).

Data are collected through interviews that professional IAB interviewers conduct. The interviews are face-to-face in order to ensure high data quality. Yearly continuation rate from firms is 83 percent. (Bossler, Gerner 11). The researchers remove firms who reported that they adjusted

wages in 2014 in anticipation of the minimum wage implementation prior to answering to the survey. By doing this they remove an anticipatory effect that may have biased the results.

METHODOLOGY

The paper I am critiquing is hefty with several outcomes, specifications, relationships being modeled, and heterogeneity controls. I will only be focusing on a few for the sake of brevity. I will be looking at extensive margin affectedness for treatment assignment. Under this definition, any firm that has at least one employee under the € 8.50 minimum wage in 2014 is assigned to be part of the treatment group. All others are in the control group. About 12 percent of firms in the survey are affected by the minimum wage and therefore in the treated group.

The first specification I will be examining is a difference-in-differences specification attempting to find the causal effect of being affected by the minimum wage on average wages. The unit of analysis is an establishment *i* in a year *t*.

$$Ln(wages/worker)_{it} = treated_i * treatment\ time_t * \beta_{ToT} + X_{it}\beta + \gamma_t + \theta_i + \varepsilon_{it}$$

Equation 1: Treatment effect on log wages per worker

The second specification I will consider is the treatment effect on firm level employment.

$$Ln(employment)_{it} = treated_i * treatment\ time_t * \delta_{ToT} + X_{it}\beta + \gamma_t + \theta_i + \varepsilon_{it}$$

Equation 2: Treatment effect on log employment

Finally, I will examine the 2SLS regression of estimated wages per worker on employment. This IV specification uses equation 1 as a first stage with minimum-wage treatment as an instrumental variable.

$$Ln(employment)_{it} = Ln(\widehat{wages/worker})_{it} * \eta_{2SLS} + \gamma_t + \theta_i + \varepsilon_{it}$$

Equation 3: IV specification, local employment elasticity of wages/worker

Table 2
Wage effects, employment effects, and employment elasticities

	Wage effect	Employment effect	Employment elasticity	
	(1)	(2)	(3)	(4)
	Log wages per worker	Log employ-ment	Moment estimator	2SLS
Panel A: Extensive margin effects (0/1)				
ToT_{DiD}	0.048 (0.010)	-0.019 (0.008)	-0.396 (0.182)	-0.266 (0.170)
$Placebo_{DiD}$	-0.016 (0.009)	0.0002 (0.0072)		

Figure 1: Specification outcomes

We see the outcomes of our regression specifications in Figure 1. A firm being in the treatment group results in 4.8 log point increase in wages per worker and a 1.9 log point decrease in employment compared to being in the control group. The 2SLS estimation of employment / wages per worker elasticity is -0.266.

Critique 1 – Data Missing Not-At-Random.

More affected treatment firms are more likely to want to be represented in the survey.

As mentioned before, the continuation rate of firms appearing in the IAB survey is 83 percent, meaning that 17 percent of firms dropped out of the survey from 2014 to 2015. Of treated firms, I think that firms who were most effected (had to decrease employment the most) would like to be represented in the survey and therefore would be over-sampled.

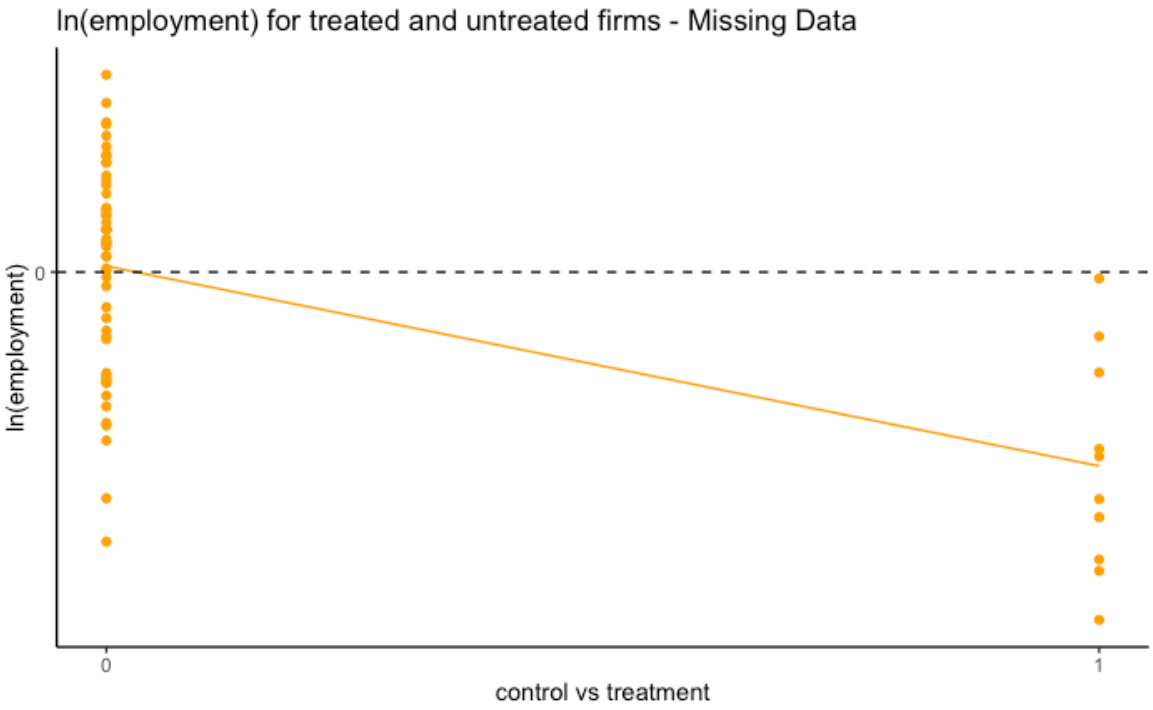

Figure 2: Regression with less impacted treatment firms missing

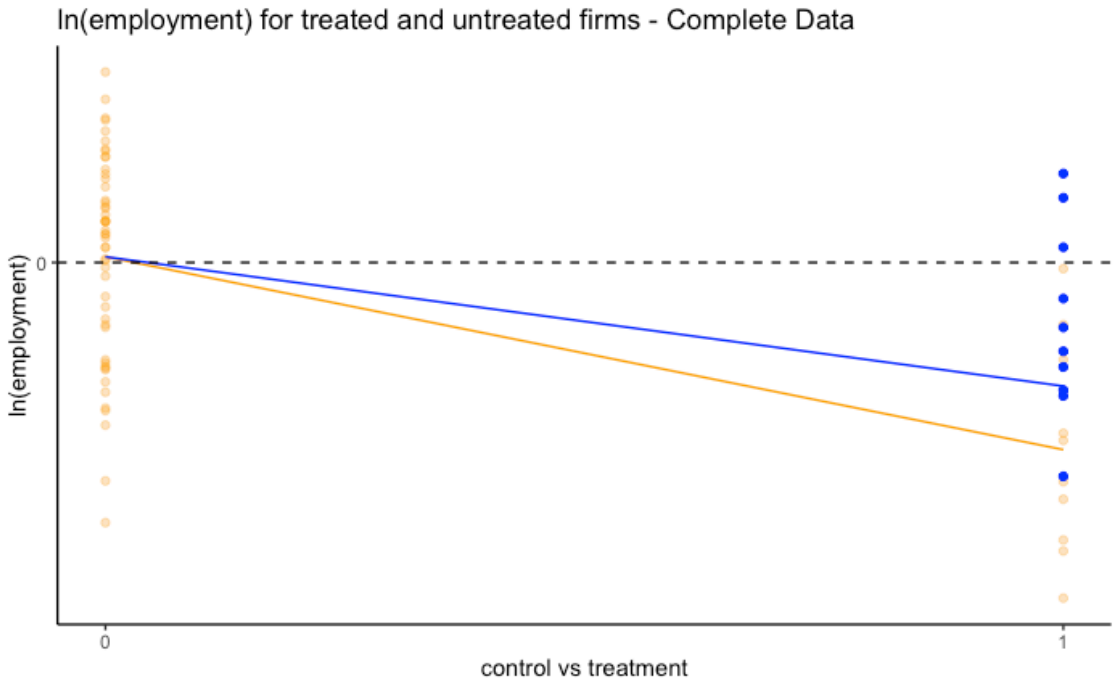

Figure 3: Regression with proposed representative data

By comparing Figures 2 and 3, we see that if there is truth to this critique, it would bias the treatment coefficient estimate downwards.

Critique 2 – Data Missing Not-At-Random.

Establishments that closed between 2014 and 2015 are not recorded.

If a firm was present in the 2014 data but not the 2015 data because it went out of business, it would not be present in the data. Most importantly if a firm was forced to close because of the implementation of the minimum wage imposition, we would see am upward bias on the employment coefficient.

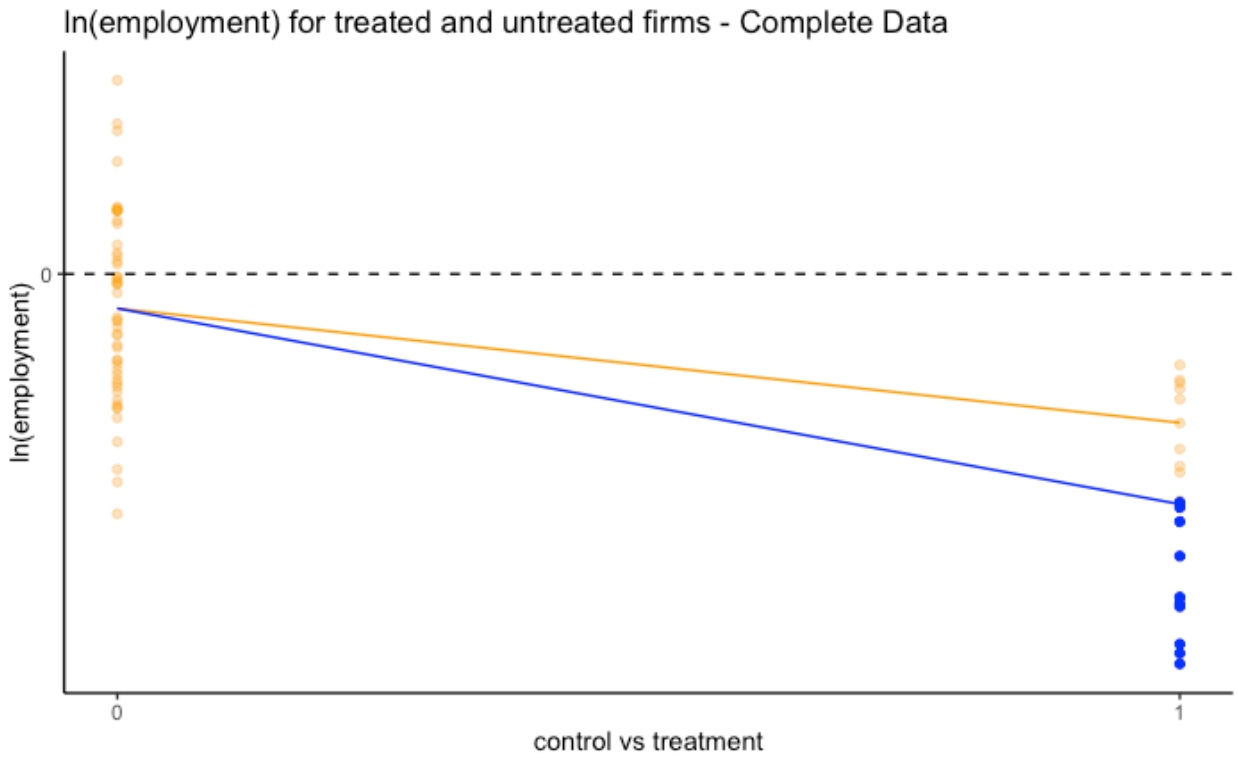

Figure 4: Regression with true and observed data given firm closures

Figure 4 shows the observed and true regressions given this missing data pattern. The observed regression is in orange while the true regression is in blue. We see that this missingness pattern would result in an upward bias in our estimation of the log employment coefficient.

CRITIQUE 3 – INSTRUMENTAL VARIABLE VALIDITY.

A FIRM'S PROPENSITY TO USE INDEPENDENT CONTRACTORS FOR LOW VALUE VALUED LABOR POSES RISK TO INSTRUMENT EXOGENEITY

Our instrumental variable specification estimating employment / wage per worker elasticity has the following variables.

Y: Employment at firm *i*
X: Wages/Worker at firm *i*
Z: Treatment (Whether firm had at least one worker affected by minimum wage)

I propose an omitted variable, a firm's willingness to use independent contractors for low valued labor, presents endogeneity issues for this instrument. This omitted variable is potentially related to all three previous variables in the following ways.

Y – Firms that use more contracted labor are likely to have less official employment numbers.
X – Firms that use contracted labor for low valued work are likely to have high wages per worker on average because official employees occupy higher valued positions.
Z – Firms that use contractors for low valued labor are less likely to have at least one employee under the minimum wage threshold.

CONCLUSION

Given that the two missing data critiques bias our estimate of treatment coefficient on log employment in opposite directions, we cannot say whether the current estimate is likely to be an upper or lower bound on the true coefficient estimate.

The validity of the estimation of local employment / wages per worker elasticity is threatened by the endogeneity produced by the omitted variable of whether a firm contracts out its low valued labor to independent contractors.

This was a quality paper and my critiques are relatively minor. I believe the authors will consider to refine their methodologies to produce robust results as we get better long-term data on the effects of minimum wage laws in Germany.