The Impact of the Minimum Wage on Employment and Poverty

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Summary: The impact of the minimum wage on employment and the poverty rate is examined in a panel data set of US states, over the 1977-2011 period. One finds that the impact of the minimum wage on employment is mixed, ranging from a negative and statistically significant impact to a nonsignificant positive effect. The poverty rate typically decreases in response to an increase in the minimum wage, but the effect is not always statistically significant.

Data

The data are drawn from Business Dynamics Statistics (BDS) from the Bureau of the Census, the Quarterly Census of Employment and Wages (QCEW) from the Bureau of Labor Statistics (BLS), and the Quarterly Workforce Indicators (QWI), also from the Bureau of the Census, as compiled by Jonathan Meer and Jeremy West at University of Texas at Austin[1], augmented with poverty data from the Census Bureau.[2] The data are organized in a pooled cross-section time series panel, 1977-2011.

Employment

A log-log specification, which takes the general form, is used:

$$emp_{it} = \beta_1 minw_{it} + \beta_2 pop_{it} + \beta_2 SHARE_{it} + \beta_3 ypc_{it} + time\ effects + \delta_{1i} t + \delta_{2i} t^2 + \alpha_i + e_{it}$$

Where *emp* is log employment, *minw* is log real state minimum wage, and *pop* is log population, *SHARE* is the share of population that is age15-59, *ypc* is real per capita gross state product, and *t* is a *state-specific* time trend. Priors are $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 > 0$, and β_1 ? 0. Population and share serve to normalize the employment numbers accounting for potential labor force, while per capita income proxies for the business cycle. The coefficients on the state-specific time trends will depend on the deterministic time trends in both the left hand side and right hand side variables.

The results are reported in Table 1. Simple OLS without time or fixed effects yields a statistically significant estimate of the elasticity of -0.264. Given the heterogeneity of the states, it is important to include

[1] Data available http://econweb.tamu.edu/jwest/files/Meer_West_MinimumWage_2013_Code.zip .
[2] Data retrieved from http://www.census.gov/hhes/www/poverty/data/historical/hstpov19.xls .

state specific (or individual) fixed effects; doing so does not change the results appreciably. Since many state minimum wages are bound by the Federal minimum wage, there would seem to be a common fixed time effect in the data; Including time fixed effects does result in a drop in the elasticity (in absolute value). As there appear to be state-specific time trends in employment and the other right hand side variables, augmenting the specification with state-specific linear time trend or quadratic in time trend is appropriate. The results in a positive, but insignificant coefficient. Because employment and output are likely to be jointly determined, it makes sense to instrument per capita output. I use US real GDP per capita, assuming that any given state's employment is unlikely to affect national GDP, and lagged real state GSP (the first stage regression has an R^2 of 0.98). The resulting estimate is 0.02, and is statistically insignificant, using conventional (i.e., non-robust) standard errors. The preferred estimate is those obtained including individual and time fixed effects, and either a linear or quadratic time trend, in which case the point estimate is positive and statistically insignificant.[3]

TABLE 1: Dependent variable Log Employment

	OLS	OLS	OLS	OLS	OLS	IV
minw	-0.264	-0.280	-0.152	0.015	0.016	0.018
	(0.076)***	(0.027)***	(0.044)***	(0.019)	(0.019)	(0.015)
pop	1.019	1.053	0.945	0.841	0.844	0.834
	(0.018)***	(0.073)***	(0.041)***	(0.088)***	(0.088)***	(0.033)***
SHARE	0.753	3.472	3.169	2.238	2.237	1.996
	(0.832)	(0.422)***	(0.436)***	(0.367)***	(0.368)***	(0.131)***
ypc	0.427	0.336	0.155	0.362	0.361	0.393
	(0.074)***	(0.066)***	(0.081)*	(0.057)***	(0.057)***	(0.013)***
Fixed effects	no	yes	yes	yes	yes	yes
Time effects	no	no	yes	yes	yes	yes
Time trend	no	no	no	yes	no	no
Time-squared	no	no	no	no	yes	yes
_cons	-5.788	-6.975	-3.613	-12.778	-8.381	0.299
	(0.208)***	(0.546)***	(0.939)***	(0.957)***	(0.446)***	(0.919)
R^2	0.99	0.94	0.96	0.98	0.98	
N	1,785	1,785	1,785	1,785	1,785	1,785

Notes: Clustered robust standard errors in parentheses, except for IV specification. * $p<0.1$; ** $p<0.05$; *** $p<0.01$. IV denotes two-stage least squares, where income per capita is instrumented using US per capita income; non-robust standard errors reported.

[3] When the sample is split in half, the later sub-sample (1995-2011) exhibits a much less negative, and statistically insignificant, impact of the minimum wage on employment.

Poverty

A linear-log specification, which takes the general form, is used:

$$pov_{it} = \beta_1 minw_{it} + \beta_2 SHARE_{it} + \beta_3 urate_{it} + time\ effects + \delta_{1i} t + \delta_{2i} t^2 + \alpha_i + e_{it}$$

Where *pov* is the poverty rate, *minw* is log real minimum wage, *SHARE* is the share of population that is age15-59, *urate* is the unemployment rate, and *t* is a time trend. Rates are expressed in decimal form. Since the poverty rate is bounded between 0 and 1, it makes sense to include other bounded variables as determinants (SHARE, unemployment rate). Priors are β_2 ? 0, $\beta_3 > 0$, and β_1 ? 0. Results are reported in Table 2.

TABLE 2: Dependent variable poverty rate

	OLS	OLS	OLS	OLS	OLS	IV
minw	-0.059	-0.002	0.021	-0.008	-0.008	-0.025
	(0.008)***	(0.007)	(0.010)**	(0.010)	(0.010)	(0.005)***
SHARE	-0.371	-0.557	-0.452	-0.382	-0.383	-0.385
	(0.051)***	(0.093)***	(0.096)***	(0.114)***	(0.114)***	(0.063)***
urate	1.049	0.561	0.596	0.569	0.569	0.647
	(0.044)***	(0.032)***	(0.051)***	(0.051)***	(0.051)***	(0.032)***
Fixed effects	no	yes	yes	yes	yes	yes
Time effects	no	no	yes	yes	yes	yes
Time trend	no	no	no	yes	no	no
Time-squared	no	no	no	no	yes	yes
_cons	0.411	0.444	0.325	0.395	0.372	0.669
	(0.034)***	(0.059)***	(0.063)***	(0.211)*	(0.124)***	(0.052)***
R^2	0.34	0.40	0.44	0.53	0.53	
N	1,632	1,632	1,632	1,632	1,632	1,632

Notes: Robust standard errors in parentheses, except for IV specification. * p<0.1; ** p<0.05; *** p<0.01. IV denotes two-stage least squares, where income per capita is instrumented using US unemployment rate; non-robust standard errors reported.

A 1% increase in the minimum wage decreases the poverty rate .06 percentage points, controlling for working age share, and the unemployment rate. Once individual fixed effects are included, the coefficient becomes insignificant. Inclusion of time effects yields a positive and significant effect. Adding a linear or quadratic time trend results in insignificant effects. Instrumenting unemployment using national unemployment and lagged state unemployment restores a significant negative coefficient of -0.025 (the first stage regression yields an R^2

of 0.83).[4] The preferred estimate is the IV estimate of -0.025. This implies a 35% increase in the real minimum wage would result in an approximately 0.9 percentage point reduction in state-level poverty.

[4] When the sample is split in half, the impact of the minimum wage on poverty is much more negative; that is an increase in the state minimum wage tends to decrease the minimum wage.