Institute for Employment Research
The Research Institute of the Federal Employment Agency

High-impact minimum wages and heterogeneous regions

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Background: The minimum wage debate

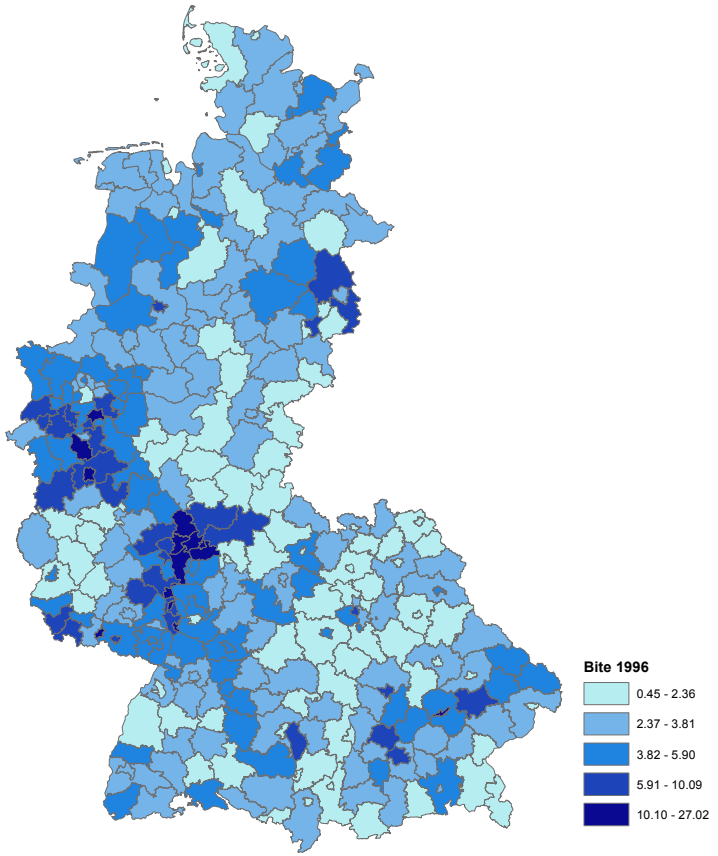
- No consensus on the effects of minimum wages, especially on employment
- Card (1992), Katz/Krueger (1992), Card/Krueger (1994/2000) find no negative employment effects
- Newmark/Wascher (1992/2000) find negative effects
- By now a large literature has evolved (Doucouliagos/Stanley 2009) including many countries (Newmark/Wascher 2008)

Background: The German case (Construction)

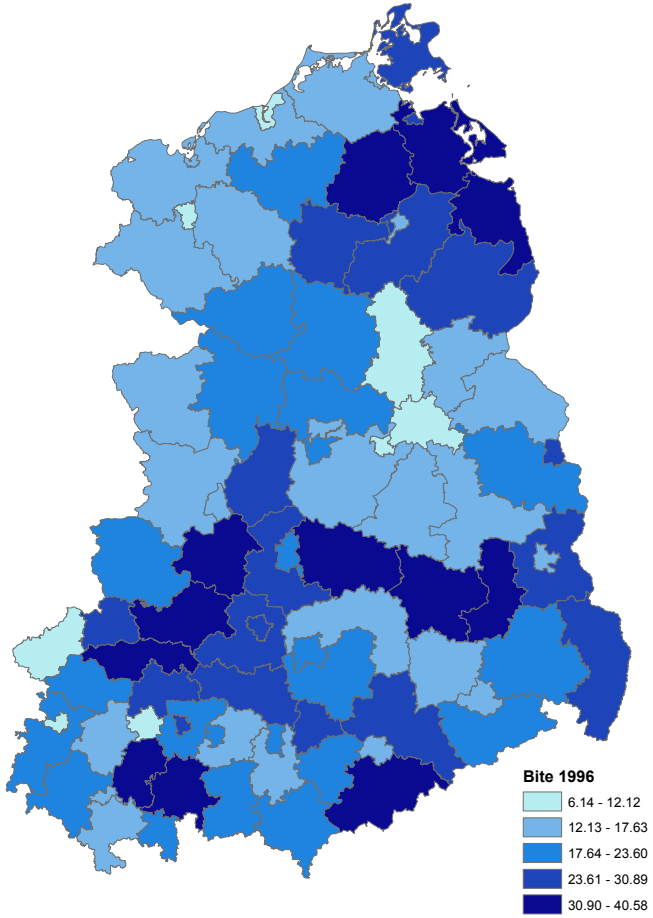
- No national minimum wage in Germany, but there are sectoral minimum wages via universal applicability of collective agreements
- Minimum wage in main construction sector introduced in 1997
- Agreement after a considerable inflow of posted workers during reunification boom
- The effects? Not much agreement in the previous literature:

  König/Möller (2009), Rattenhuber (2011), Apel et al. (2012), Müller (2012), Frings (Forthcoming)

Distribution of the minimum-wage bite in 1996



(a) West Germany



(b) East Germany

Idea: A spatial identification strategy

- **Main research question**: Did the minimum wage introduction (and subsequent increases) in the construction sector have an effect on (i) wage growth and (ii) employment growth?
- **Strategy**: Compare regions where MW cuts deeper into the wage distribution with those where it does not.
- **Also:**
  - Use panel structure to control regional FE, time FE and trends
  - Model neighborhood effects (Spatial model)
  - Model local heterogeneity (Border discontinuities)
- **Findings:**
  - No effects in West Germany
  - Positive wage, negative employment effects in East Germany

Data

- Observation period: 1993–2002
- Population of construction workers subject to social security constributions
- Self-employed and posted workers are not covered
- Focus on male, full-time employed workers
- Wages = Average daily wages
- No information on working hours
- Reference date: June 30th

The basic model

$$\Delta \ln y_{it} = \mathbf{b}_{it}\alpha + (d \times \mathbf{b}_{it})\beta + \Delta \ln \mathbf{x}_{it}\gamma + \mu_i + \tau_{jt} + \epsilon_{it}$$

with

$\Delta \ln y_{it}$	:	wage/emp. growth
$\mathbf{b}_{it}$	:	bite
d	:	dummy after MW intro
β	:	treatment effect
$\Delta \ln \mathbf{x}_{it}$	:	controls
μ_i	:	regional FE
τ_{jt}	:	time dummy east/west

Effect on mean wage growth

	(1)	(2)	(3)	(4)
Artificial bite (West)	0.333***	0.331***	0.386***	0.328***
	(0.043)	(0.044)	(0.053)	(0.044)
Artificial bite (East)	0.125***	0.131***	0.149***	0.128***
	(0.024)	(0.024)	(0.030)	(0.024)
Treatment effect (West)	−0.054**	−0.041	−0.072*	−0.021
	(0.024)	(0.027)	(0.037)	(0.029)
Treatment effect (East)	0.148***	0.147***	0.144***	0.156***
	(0.022)	(0.021)	(0.025)	(0.022)
District fixed effects	Yes	Yes	Yes	Yes
Year indicators	Yes	Yes	Yes	Yes
District-type-specific trends	No	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
Neighborhood effects	No	No	Yes	Yes
Wooldridge test (p-value)	0.434	0.409	0.412	0.475
Within R^2	0.395	0.399	0.401	0.400
Observations	3708	3708	3708	3708

Notes: Model (3) defines neighbors as being in the same labor-market region and Model (4) defines neighbors as sharing a common border. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are enclosed in parentheses and clustered at the district level.
Source: Authors' calculations based on the IEB.

Effect on mean employment growth

	(1)	(2)	(3)	(4)
Artificial bite (West)	−0.152	−0.105	−0.261	−0.177
	(0.150)	(0.151)	(0.187)	(0.154)
Artificial bite (East)	0.012	−0.026	−0.048	−0.041
	(0.111)	(0.110)	(0.138)	(0.111)
Treatment effect (West)	0.130	0.005	0.044	0.078
	(0.131)	(0.130)	(0.192)	(0.150)
Treatment effect (East)	−0.385***	−0.368***	−0.319***	−0.340***
	(0.093)	(0.093)	(0.112)	(0.102)
District fixed effects	Yes	Yes	Yes	Yes
Year indicators	Yes	Yes	Yes	Yes
District-type-specific trends	No	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
Neighborhood effects	No	No	Yes	Yes
Wooldridge test (p-value)	0.463	0.452	0.435	0.409
Within R^2	0.379	0.382	0.385	0.384
Observations	3708	3708	3708	3708

Notes: Model (3) defines neighbors as being in the same labor-market region and Model (4) defines neighbors as sharing a common border. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are enclosed in parentheses and clustered at the district level.
Source: Authors' calculations based on the IEB.

Extensions

- **Spatial spillovers:**
  - We test whether a more elaborate spatial structure is necessary
  - If the model is correctly specified, both OLS and a SEM (Spatial Error Model) should yield consistent estimates
  - Spatial Hausman test (Pace/LeSage 2008): Differences point towards misspecification
  - Result: No significant difference
- **Local heterogeneity:**
  - Border discontinuity approach (Dube/Lester/Reich 2010)
  - Build data set consisting of all potential natural experiments across district borders
  - Compute average minimum-wage effect
  - Result: Estimates close to basic model

Conclusion

- We find no hints for a significant effect of the minimum wage on wages and employment in West Germany
- We find evidence for significant effects in East Germany:
  An increase in the bite by one percentage point is associated with
  - an increase in the growth rate for wages between .10/.16 and
  - a decrease for employment growth of .32/.39 percentage points
- This effect is quite large. About half of the decline in employment after the introduction is due to the minimum wage
- This result is stable for the preferred models dealing with different aspects of spatial heterogeneity and dependencies

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Thank you for your attention

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