Do Place-Based Tax Incentives Create Jobs?

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Motivation

• Employment a main indicator for socio-economic wellbeing and income equality.

• Large (within-country) regional differences in employment rates.

  → Example

• Regional differences in employment rates and labor market opportunities can be persistent over time and have long lasting consequences.

  (Chetty, Hendren, Kline and Saez (2014))
Motivation

Place-based policies to stimulate regional employment:

- Enterprise Zones program - UK (1980s), US.
  Tax breaks, reduced regulations for firms.

- The European Regional Development Fund.
  Transferring means from more developed to underdeveloped regions.
  2014-2020: Euros 351.8 bn.

- Geographically differentiated payroll taxes
  Payroll taxes: flat taxes levied on firms, proportional to workers’ earnings.
  Nordic countries, Argentina.
This Paper

- The system of geographically differentiated payroll taxes in Norway was abolished in 2004 due to an EU ruling.

- The Norwegian government introduced a subsidy scheme to relieve small firms.
This Paper

- The system of geographically differentiated payroll taxes in Norway was abolished in 2004 due to an EU ruling.
- The Norwegian government introduced a subsidy scheme to relieve small firms.
- We look at firm responses to the increase in regional payroll tax rates among large firms.
The increase in payroll taxes had a relatively small impact on wages.

The affected firms instead respond by significant reductions in employment.

- Some firms have multiple establishments.
- Impacts are particularly pronounced in multi-establishment firms.
- Reduced establishment entry and increased exit.
Related Literature

- **Regional** payroll tax changes:


- **National** payroll tax changes, targeting particular groups of workers:

  Saez, Matsaganis and Tsakloglou (2012); Saez, Seim and Schoefer (2017); Lehmann, Marical and Rioux (2013).

→ Mixed effects on employment and wages.

- Our contributions:

  1. Firm adjustments.
  2. EU induced tax change.
Institutional Setting
Payroll Taxes in Norway

- Generous social security system.
- Employees contribute 8.2%.
- Employers' contributions (payroll taxes) are geographically differentiated.
- All employees draw the same benefits from the scheme.
Institutional Setting

Geographically Differentiated Tax Rates, 2003
Institutional Setting
The Payroll Tax Harmonization Reform

1999: Sweden complains

2002: ESA demands change
   Arguing! Ok, keep the system ("direct transport aid")

2003: March

2004

2006: Restoration of differentiated tax rates

Tax harmonization
Institutional Setting

Tax Harmonization - and Differentiation

<table>
<thead>
<tr>
<th>Year</th>
<th>Zone 1</th>
<th>Zone 1a</th>
<th>Zone 2</th>
<th>Zone 3</th>
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</table>
Institutional Setting
Wage Setting in Norway

• Central bargaining.

• High degree of unionization.
  • 2014: 50% unionized, 70% of private sector workers covered by collective bargaining agreements (through firm employer federation membership).

• Guiding idea: The outcome of wage negotiations in tradable sectors should set the norm for all sectors.

• Minimum wage increase determined by centralized bargaining.

• Serves as a norm in other private sectors and the public sector.
Empirical Strategy

Outline

- Relevant tax rate is based on where the workers live.
- Firms might employ workers from different tax zones:
  - Establishments in different tax zones.
  - Located near a border.
  - Workers commute.
- We compare more and less exposed firms before and after the tax harmonization.
Empirical Strategy
Changes in the Statutory Tax Rate

• Firm $j$’s statutory tax rate in year $t$ (based on 2003 worker composition):

$$\bar{\tau}_{j,t} = \frac{\sum_{i=1}^{N_{j,t=2003}} \omega_{i(j)} \times \tau_{i(z,j)_{t}}}{N_{j,t=2003}} \quad (1)$$

• In parts of the analysis, we split firms into two groups by degree of exposure.
  • Construct a measure of a firm’s exposure to the tax harmonization:

$$\Delta \bar{\tau}_{j} = \bar{\tau}_{j,t=2006} - \bar{\tau}_{j,t=2003} \quad (2)$$

$$Stat.\ treatment_{j} = \begin{cases} 
1 & \text{if } \Delta \bar{\tau}_{j} \geq 4\ pp. \\
0 & \text{otherwise}
\end{cases} \quad (3)$$
Empirical Strategy

Firms Exposed to the Statutory Tax Increase

Firms with tax incr. > 0
- (75,950)
- (50,75)
- (20,50)
- (15,20)
- (10,15)
- (5,10)
- (3,5)
- (1,3)
- [0,1]

Treated firms (tax incr. > 4pp.)
- (100,150)
- (50,100)
- (20,50)
- (10,20)
- (5,10)
- (3,5)
- (1,3)
- [0,1]
Institutional Setting
Subsidy - To Relieve Small Firms

- Small firms were unaffected by the harmonization (assuming no spillover effects).
  - To ease the burden on firms, a subsidy scheme was implemented in 2004.

\[
S_{j,t} = \min \left( \sum_{i=1}^{N_{j,t}} w_{i,t} \times (\tau_{i,t}^{o} - \tau_{i,t}^{l}), \bar{S} \right),
\]

where \( w_{i,t} \) is the total earnings of worker \( i \) in year \( t \), \( N_{j,t} \) is the number of workers in firm \( j \) in year \( t \), and \( \bar{S} \) is the maximum subsidy of around 270,000NOK (40,000 USD) per year.
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- Predict the subsidy a firm will receive based on 2003 wage bill.

→ Predict a firm's effective tax rate.
Empirical Strategy

Statutory treated firms

Statutory control firms
Empirical Strategy
Main Regression Equation

\[ \ln(y_{j,t}) = \beta \ln(1 + \bar{\tau}_{j,t}) + \rho_t + \delta_j + \epsilon_{j,t} \] (5)

\( y_{j,t} \) is the outcome variable of interest (employment and wages) in firm \( j \) in year \( t \);
\( \bar{\tau}_{j,t} \) is the statutory tax rate based on the firm’s worker composition in 2003;
\( \rho_t \) and \( \delta_j \) denote year- and firm fixed effects;
\( \epsilon_{j,t} \) is an error term.
Data

- Data:
  - Tax records: information on workers' wages.
  - Worker demographics, in particular: municipality of residence.

- Creating the firm level data:
  - Aggregate spells of all workers aged 15-74.
  - Firm level because of subsidy.
  - Private sector firms with at least two employees
## Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>Treated (large tax incr.)</th>
<th>Control (zero/small tax incr.)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Large</td>
<td>Small</td>
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<tr>
<td>Daily wages</td>
<td>865</td>
<td>676</td>
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<tr>
<td>Workers</td>
<td>35</td>
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<td>Days</td>
<td>11,785</td>
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<td>Statutory tax rate 2003</td>
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<tr>
<td>Change in stat. tax rate 03-06</td>
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<tr>
<td>Change in eff. tax rate 03-06</td>
<td>0.023</td>
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<tr>
<td>Number of firms</td>
<td>954</td>
<td>3,936</td>
</tr>
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</table>
Results

Event Study: Large Firms

Log Workers

Log Daily Wage Rate
Results

Event Study: Small Firms (Placebo)

Log workers

Log daily wage rate

Year

Controls (no/small stat. tax incr.) Treated (large stat. tax incr.)
## Results

### Regression Results

<table>
<thead>
<tr>
<th></th>
<th>Large firms</th>
<th>Small firms</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Workers</td>
<td>Daily wage rate</td>
<td>Workers</td>
</tr>
<tr>
<td>Log(1+ stat. tax rate)</td>
<td>-1.865***</td>
<td>-0.260**</td>
<td>-0.315*</td>
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<tr>
<td></td>
<td>[0.567]</td>
<td>[0.118]</td>
<td>[0.174]</td>
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<tr>
<td>R2</td>
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<td>0.90</td>
<td>0.83</td>
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<tr>
<td>N</td>
<td>75,432</td>
<td>75,432</td>
<td>229,495</td>
</tr>
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</table>

*Notes: Outcome variables in logs.*
Results
Multi- versus Single-Establishment Firms

- 17% of firms in 2003 are multi-establishment firms.
- Average of 3.8 establishments per firm.
- Employ 27% of all workers in 2003.
Multi- versus Single-Establishment Firms

Results

**Multi: Log Workers**

<table>
<thead>
<tr>
<th>Year</th>
<th>Controls (no/small stat. tax incr.)</th>
<th>Treated (large stat. tax incr.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
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<tr>
<td>2001</td>
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<td>-2.2</td>
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<td>2002</td>
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<td>-2.1</td>
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<td>2003</td>
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<td>-2</td>
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<tr>
<td>2004</td>
<td>0.1</td>
<td>-1.9</td>
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<tr>
<td>2005</td>
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<td>-1.8</td>
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<tr>
<td>2006</td>
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<td>-1.7</td>
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**Multi: Log Daily Wage Rate**

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<thead>
<tr>
<th>Year</th>
<th>Controls (no/small stat. tax incr.)</th>
<th>Treated (large stat. tax incr.)</th>
</tr>
</thead>
<tbody>
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<td>2000</td>
<td>-2.2</td>
<td>-2.1</td>
</tr>
<tr>
<td>2001</td>
<td>-2.1</td>
<td>-2</td>
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<td>2002</td>
<td>-2.0</td>
<td>-1.9</td>
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<td>2003</td>
<td>-1.9</td>
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<td>-1.6</td>
</tr>
<tr>
<td>2006</td>
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<td>-1.5</td>
</tr>
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</table>

**Single: Log Workers**

<table>
<thead>
<tr>
<th>Year</th>
<th>Controls (no/small stat. tax incr.)</th>
<th>Treated (large stat. tax incr.)</th>
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</thead>
<tbody>
<tr>
<td>2000</td>
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<td>-2.3</td>
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<td>2001</td>
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<td>2002</td>
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<td>2003</td>
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<td>-2</td>
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<tr>
<td>2004</td>
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<td>-1.9</td>
</tr>
<tr>
<td>2005</td>
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<td>-1.8</td>
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<tr>
<td>2006</td>
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<td>-1.7</td>
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</tbody>
</table>

**Single: Log Daily Wage Rate**

<table>
<thead>
<tr>
<th>Year</th>
<th>Controls (no/small stat. tax incr.)</th>
<th>Treated (large stat. tax incr.)</th>
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<tbody>
<tr>
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Adjustment Mechanisms
Number of Establishments per firm
(Multi-Establishment Firms)
Decomposing Employment Reductions

Extensive Margin

<table>
<thead>
<tr>
<th></th>
<th>Multi-estab. firms</th>
<th>Single-estab. firms</th>
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<tbody>
<tr>
<td>Total empl. reduction</td>
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<tr>
<td>Exit</td>
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<td>Strategic exit</td>
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<tr>
<td>Entry</td>
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Decomposing Employment Reductions

Intensive

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<td>Hiring</td>
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<td>Separations</td>
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<tr>
<td>Total empl. reduction</td>
<td>-.15</td>
<td>-.05</td>
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</table>

Hiring and separations contributing to the total employment reduction in multi-estab. firms and single-estab. firms.
Worker Level Analysis

• Follow all workers employed in a large treated or control firm in 2003.

• Sample of 576,080 workers.

• Are they employed in the years following the tax harmonization reform?
### Worker Level Analysis

#### Results

<table>
<thead>
<tr>
<th>Year</th>
<th>Controls (no/small stat. tax incr.)</th>
<th>Treated (large stat. tax incr.)</th>
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</thead>
<tbody>
<tr>
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<td>0.95</td>
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<td>2004</td>
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<td>0.85</td>
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<tr>
<td>2006</td>
<td>0.8</td>
<td>0.75</td>
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</table>

- **Share employed**
- **Year**
- **Controls (no/small stat. tax incr.)**
- **Treated (large stat. tax incr.)**

**Legend:**
- Blue dashed line: Controls (no/small stat. tax incr.)
- Black line: Treated (large stat. tax incr.)
Worker Level Analysis

Results
Worker Level Analysis

- The full employment drop at the firm level does not seem to be traced among the workers employed in these firms in 2003.

- This could be due to:
  - Spillovers to small firms.
  - Reduced hiring (not picked up in worker level analysis).
Subsequent Tax Decrease

![Graph showing the log number of workers relative to 2003 over the years from 2000 to 2009. The graph compares Controls (no/small stat. tax incr.) and Treated (large stat. tax incr.) with error bars indicating variability.]
Firms facing a sudden increase in the payroll tax reduce employment.

- Partly through increased establishment exit, and reduced entry.

Outcome of centralized bargaining in 2004:

- Industry workers wage growth of 3.6% (inflation 1.6%)

Difficult for firms to cut wages in response to payroll tax increases.

Employment effects are not reversed after tax rates decrease in 2007.
Discussion

- Seems to be much smaller impacts on workers employed in affected firms in 2003.
- Some, but not large spillover effects to small firms.
- A significant part of the employment reduction explained by reduced hiring.
- Unknown what happened to these “non-hired” workers.
- Regional tax incentives may stimulate employment in underdeveloped regions (in Norway).
Motivation

Unemployment rates: Germany 2017

Berlin: 7%
Bayern: 2.3%
A1: Robustness: EU expansion

Share of EU-2004 workers

Log number of native workers

EU-04 immigrants rlt. to workers in 2003

Log number of native workers rlt. to 2003

Year

Year

Controls (no/small stat. tax incr.)

Treated (large stat.tax incr.)

Controls (no/small tax incr.)

Treated (large tax incr.)
A2: Firm Survival

- Non-balanced sample for the years 1998-2006.
- 11,599 large firms: 962 treated and 10,637 controls.
- 70% of the control firms are at least six years old in 2003, compared to 74% of treated firms.

Unweighted
A2: Firm Survival

- Non-balanced sample for the years 1998-2006.
- 11,618 large firms: 965 treated and 10,653 controls.
- 70% of the control firms are at least six years old in 2003, compared to 74% of treated firms.
A4: Adjustment Mechanisms

Internal Margin

1 Establishment exit.

2 Establishment exit by restructuring.

3 Reduced establishment entry.

4 Hiring and separations in continuing establishments.