

# The Taxing Deed of Globalization

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December 2015

# Motivation



Figure: TAXATION IN THE GLOBAL ECONOMY

# Globalization and taxation

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- ▶ Workers demand insurance from external shocks (Rodrik, 1998)
- ▶ Trade makes public spending cheaper (Epifani and Gancia, 2009)
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- ▶ Stiffer international tax competition (Devereux, M. Lockwood, B. and M. Redoano, 2008)
- ▶ More opportunities to avoid taxation (est. 20 trillion \$, Economist in 2013)

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How do governments around the globe accomplish (1) given (2) ?

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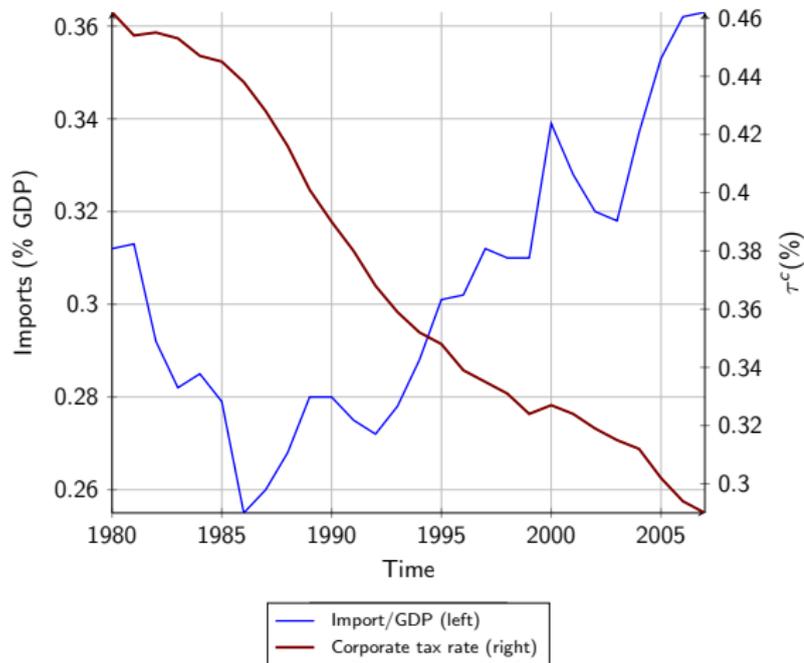


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- ▶ Develop an instrument for globalization based on insights from structural gravity models.
- ▶ Estimate the effect of globalization (across different countries and time periods) on:
  - ▶ Relative size of government revenues
  - ▶ Composition of tax revenues
  - ▶ Contribution to tax revenues (and tax rates) by different groups of population

# Instrument for openness

Define two measures of *globalization*:

- ▶ *trade* the share of exports and imports in domestic consumption of manufacturing
- ▶ *mig*, the share of migrants in total population

We can't use these measures to identify causal effect:

- ▶ Globalization measures are endogenous to taxes via demand (expenditure) and supply (cost) channels.
- ▶ To identify causality need to get rid of both channels.
- ▶ Employ new trade models featuring structural gravity models.

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$$X_{ij,t} = \frac{c_{j,t}\beta_{ij,t}}{\sum_{\ell} c_{i\ell t}\beta_{i\ell t}} Y_{i,t}$$

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1. Eliminating demand-side link:

$$\frac{X_{ij,t}}{Y_{i,t}} \equiv \pi_{ij,t} = \frac{c_{j,t}\beta_{ij,t}}{\sum_k c_{k,t}\beta_{ik,t}}$$

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3. Specifying theory-consistent instrument for  $\pi_{i,t} = \sum_{j \neq i} \pi_{ij,t}$ :

$$\beta_{i,t} = \sum_{j \neq i} \beta_{ij,t}\beta_{ji,t}$$

# Globalization and total tax revenues

To identify the effect of globalization on total tax revenues, we run:

$$100 \times \frac{TR_{i,t}}{GDP_{i,t}} = \text{const}^{tot} + \gamma^{tot} \ln(\pi_{i,t}) + \Gamma^{tot} Z_{i,t} + \lambda_t^{tot} + \mu_i^{tot} + u_{i,t}^{tot},$$

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Vector of controls,  $Z_{i,t}$ , includes:

- ▶ Skill composition in country/year
- ▶ Political regime and political orientation of parliamentary majority
- ▶ Population, real GDP per capita, interaction term

# Globalization and tax revenue composition

We consider several types of tax revenues revenues:

- ▶ Corporate taxes (*corp*)
- ▶ Employer-based social security contributions (*sscer*)
- ▶ Employee-based taxes (*employee*): labor income taxes and employee-based social security contributions
- ▶ Goods and services taxes (*goods*): value added taxes, sales taxes and other forms of taxes on goods and services
- ▶ All remaining taxes (*other*)

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Then, we run the following regressions:

$$100 \times \frac{R_{i,t}^q}{GDP_{i,t}} = \text{const}^q + \gamma^q \ln(\pi_{i,t}) + \Gamma^q Z_{i,t} + \lambda_t^q + \mu_i^q + u_{i,t}^q. \quad (1)$$

for  $q = \{corp, sscer, employee, goods, other\}$ .

# Different country groups and time periods

We split the sample into four different groups:

- ▶ **OECD vs. non-OECD**
  - ▶ Countries differ significantly in terms of social protection, involvement in global competition for tax base etc.
  - ▶ Sending/receiving migrants
- ▶ **1980-1993 vs. 1994-2007**
  - ▶ Major liberalization in mid-nineties, e.g., Maastricht Treaty (1992), NAFTA (1994), Schengen Area (1995)
  - ▶ Formal structural break tests point to 1994

Table: Trade & composition of tax revenues: OECD-Time-Split

	OECD '80-'93	OECD '94-'07	NonOECD '80-'93	NonOECD '94-'07
$\hat{\gamma}_{trade}^{total}$	1.221 (1.013)	6.214*** (1.924)	0.892 (0.850)	1.406** (0.641)
$R^2$	0.973	0.972	0.906	0.934
Obs	353	364	385	473
$\hat{\gamma}_{trade}^{corp}$	1.672*** (0.555)	-0.363 (0.609)	0.453 (0.512)	0.724* (0.425)
$R^2$	0.802	0.800	0.874	0.782
Obs	330	350	316	397
$\hat{\gamma}_{trade}^{sscer}$	4.100*** (1.138)	-0.974 (1.026)	0.094 (0.218)	-0.325** (0.162)
$R^2$	0.946	0.939	0.879	0.940
Obs	362	364	403	484
$\hat{\gamma}_{trade}^{employee}$	1.984* (1.148)	5.404*** (1.317)	0.227 (0.276)	0.743*** (0.249)
$R^2$	0.962	0.918	0.953	0.954
Obs	338	350	316	389
$\hat{\gamma}_{trade}^{goods}$	1.201* (0.666)	5.756*** (0.657)	0.523 (0.402)	0.865 (0.594)
$R^2$	0.947	0.965	0.907	0.830
Obs	353	364	366	451
$\hat{\gamma}_{trade}^{other}$	-0.973** (0.448)	-3.328*** (0.814)	-0.895 (0.809)	-1.315** (0.518)
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# Who gets taxed by globalization?

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We analyze the effect of globalization on labor income taxes of different workers:

- ▶ Calibrate wage income of 100 percentiles in each country/year
  - ▶ Pareto and Log-normal assumptions & data on earnings Gini coefficients & average wage
  - ▶ Predictions fit well available (limited) micro data
- ▶ Feed wages into country/year specific tax codes to obtain effective tax rate

For each percentile  $p = \{1, \dots, 100\}$ , we run the following:

$$100 \times \frac{\tau_{i,t}^p w_{i,t}^p}{\sum_k \tau_{i,t}^k w_{i,t}^k} = \text{const}^p + \gamma^p \ln(\pi_{i,t}) + \Gamma^p Z_{i,t} + \lambda_t^p + \mu_i^p + u_{i,t}^p.$$

# Percentile Shares in OECD, '80-'93

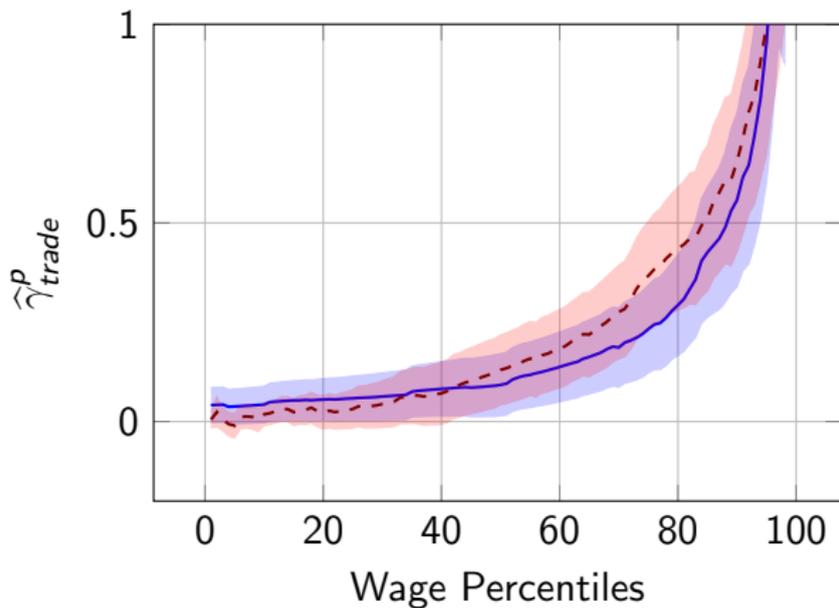


Figure: ESTIMATED COEFFICIENT & 10% CONFIDENCE BANDS

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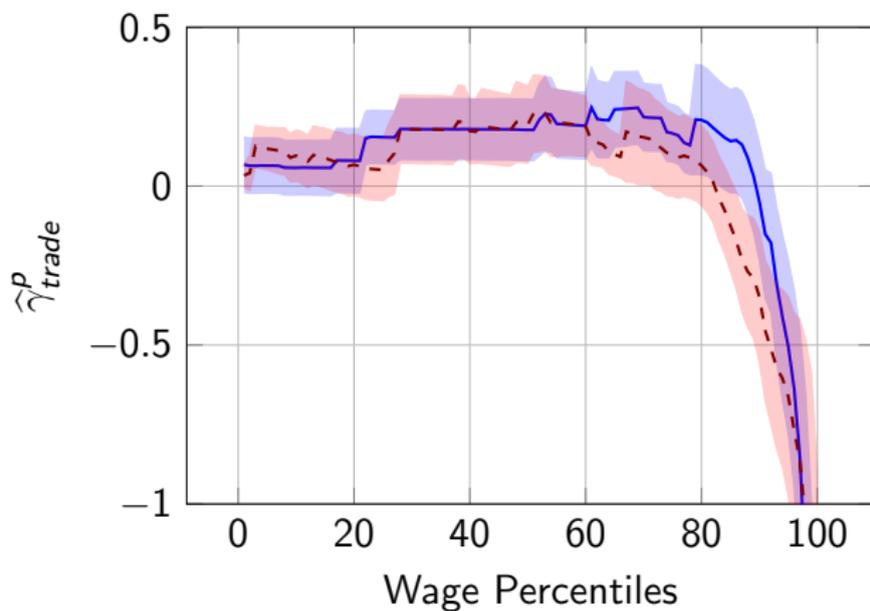


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## Percentile Shares in non-OECD, '80-'93

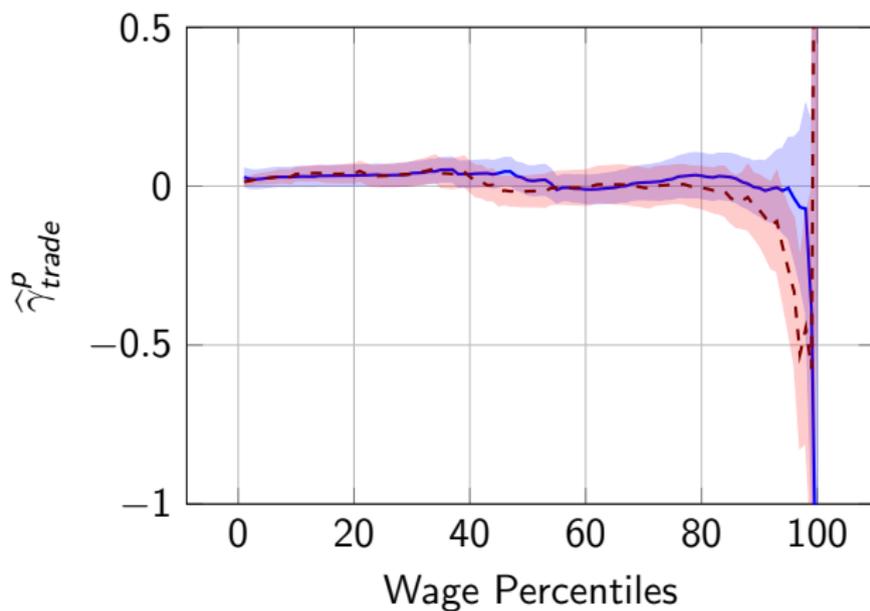


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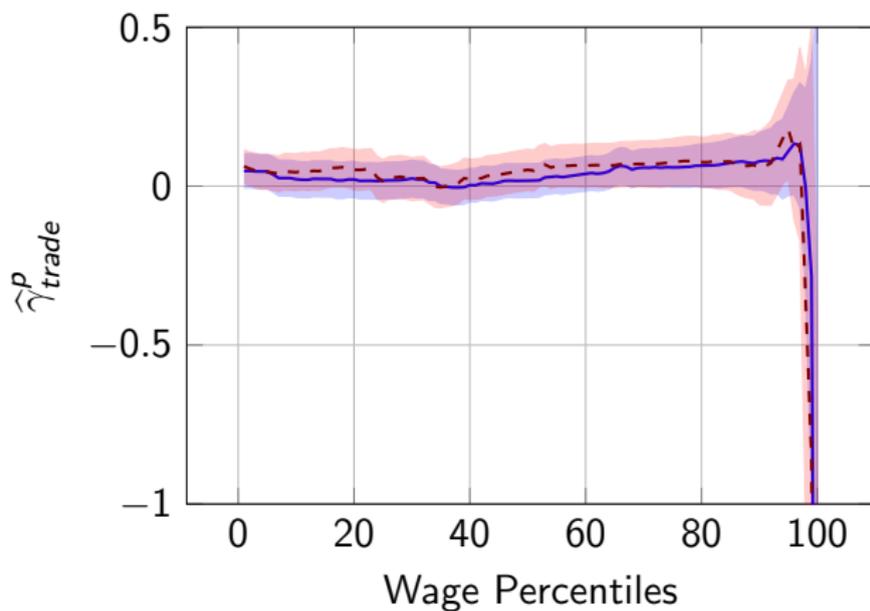


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To check the effect of globalization, we also look at the effect on the effective tax rate by percentile.

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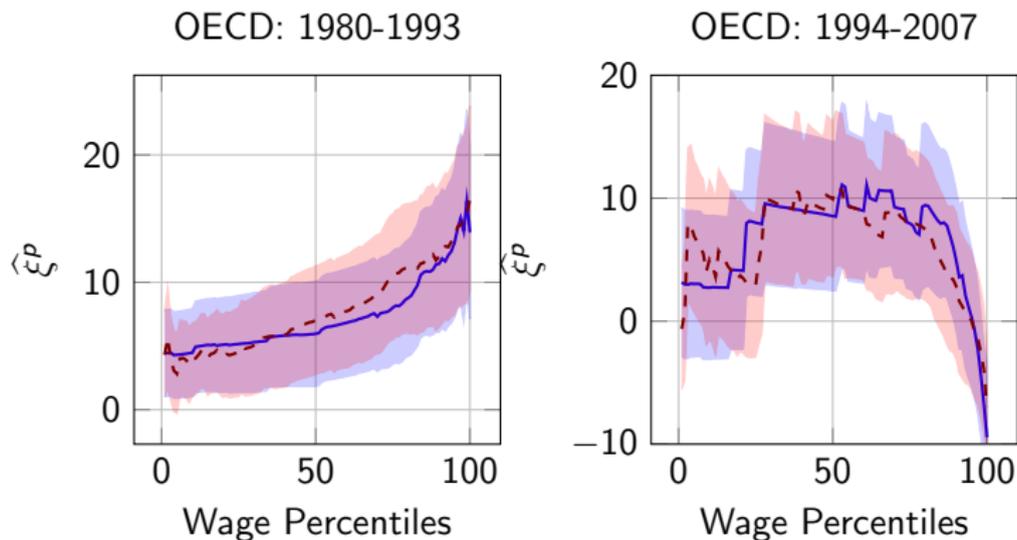


Figure: PERCENTILE-SPECIFIC TAX RATES: TRADE

## Estimated effect on individual tax rates

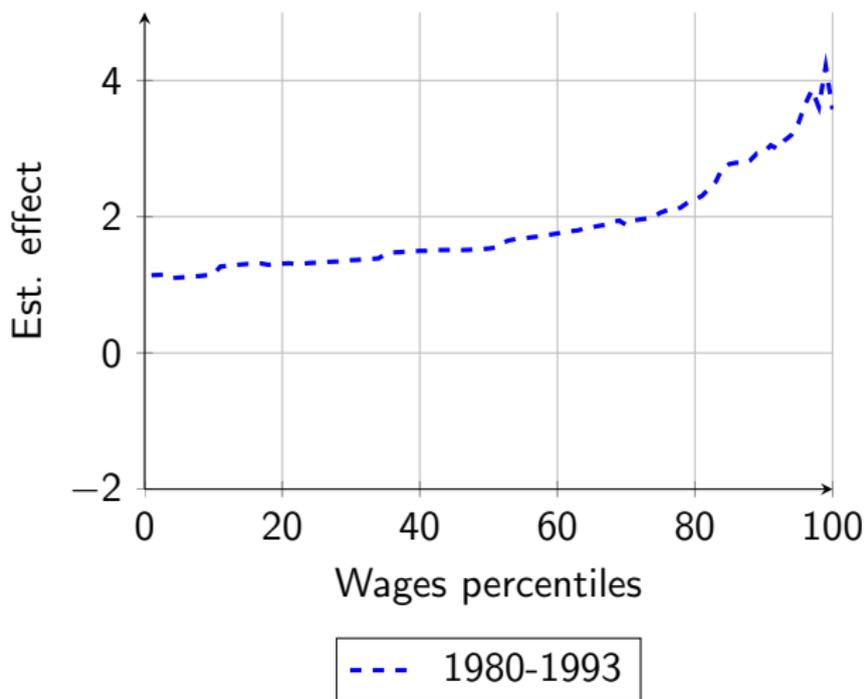


Figure: THE EFFECT OF OPENNESS ON TAX RATES FOR AN AVERAGE OECD COUNTRY

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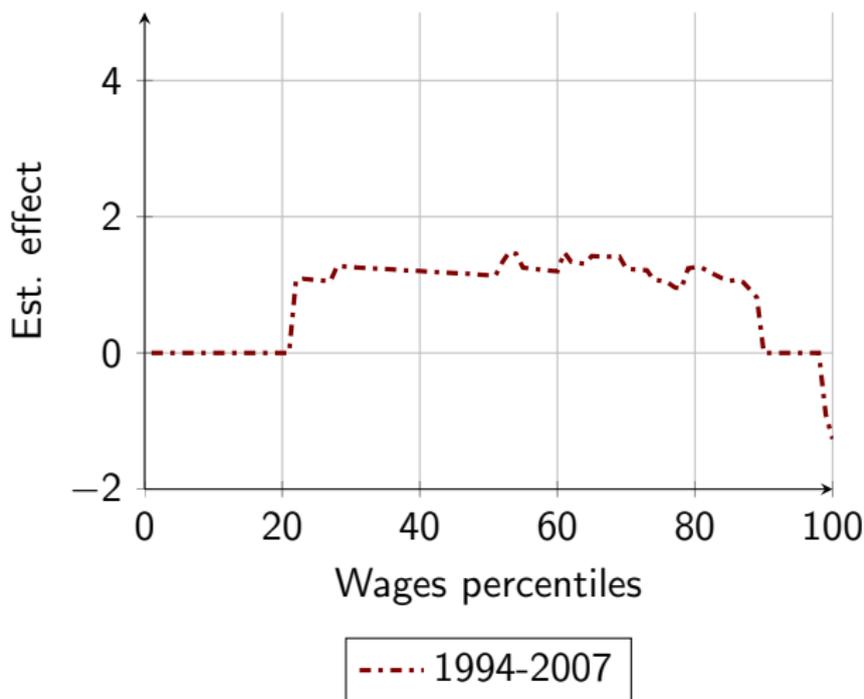


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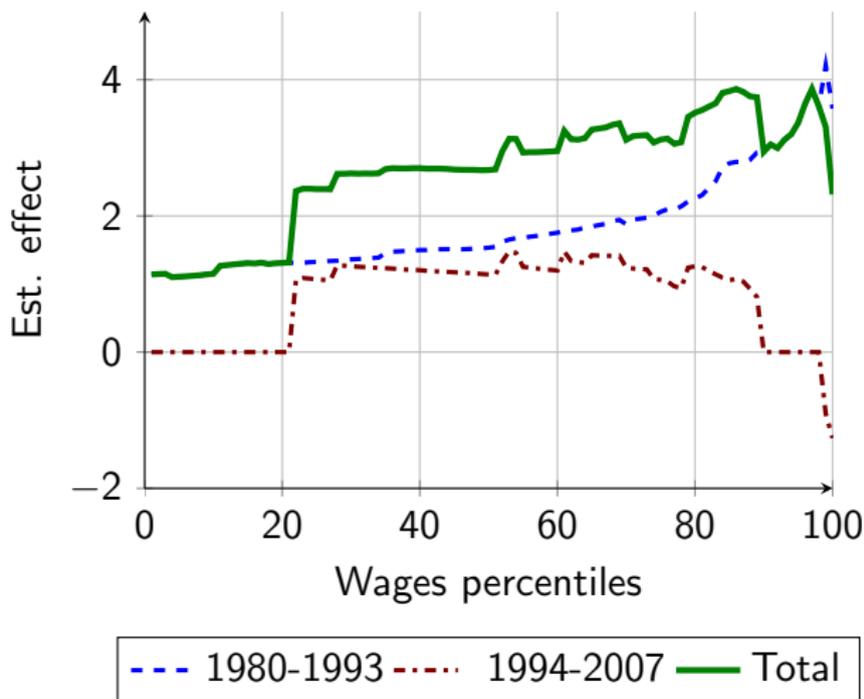


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Thank you!