

The Taxing Deed of Globalization

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Globalization and taxation

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Obs. 1 Government spending is positively correlated with globalization

- ▶ Workers demand insurance from external shocks (Rodrik, 1998)
- ▶ Trade makes public spending cheaper (Epifani and Gancia, 2009)
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Obs. 2 Factors become internationally mobile

- ▶ 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) ?

Globalization

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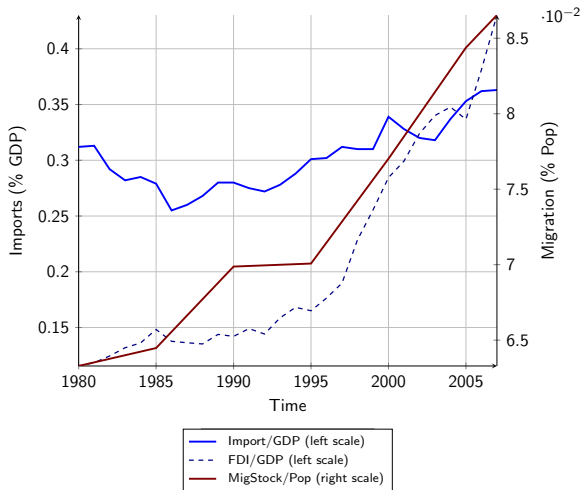


Figure: AVERAGE COUNTRY (65 BIGGEST ECONOMIES)

Firm and Employee-borne Taxes

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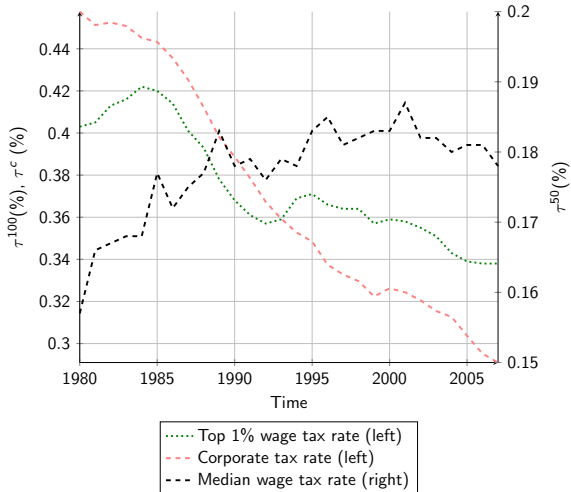


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- ▶ Develop an instrument for globalization based on insights from structural gravity models.
- ▶ Estimate the effect of globalization (across different countries and time periods) on:
 - ▶ Relative size of government revenues
 - ▶ Composition of tax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

Related literature

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- ▶ Optimal taxation theory (w and w/t) migration:
 - ▶ Mirlees (1971), Diamond (1998), Saez (2001)
 - ▶ Simula and Trannoy (2010), Saez and Piketty (2012), Lehmann, Simula and Trannoy (2014).

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Structural models of factor and goods flows:

- ▶ Eaton and Kortum (2002), Anderson and van Wincoop (2003)
- ▶ Hanson and Chiquiar (2005), Anderson (2011)

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 directly 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.

Instrument for openness cont.

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Consider a structural gravity equation as in Eaton and Kortum (2002), Anderson and van Wincoop (2003), Melitz (2003):

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

Instrument for openness cont.

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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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$$\frac{\pi_{ij,t}}{\pi_{ii,t}} \frac{\pi_{ji,t}}{\pi_{jj,t}} = \beta_{ij,t}\beta_{ji,t}$$

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3. Specifying theory-consistent instrument for $\pi_{i,t} = \sum_{j \neq i} \pi_{ij,t}$, the average cost of inward and outward trade and migration:

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

Globalization and total tax revenues

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

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

where $\ln(\pi_{i,t})$ is instrumented.

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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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- ▶ All remaining taxes (*other*)

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

Composition of revenues

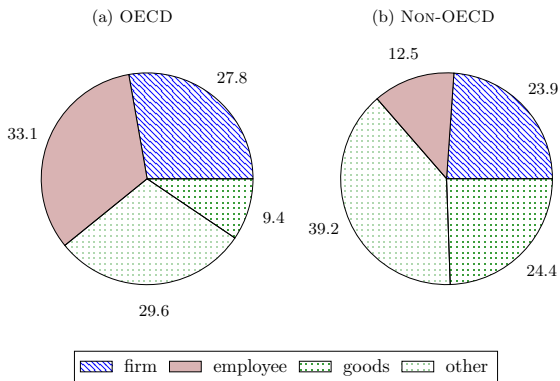


Figure: COMPOSITION OF TAX REVENUES

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
$\hat{\gamma}_{trade}^{firm}$	2.757** (1.239)	-1.107 (1.336)	0.372 (0.533)	0.412 (0.504)
R^2	0.970	0.917	0.849	0.868
Obs	330	350	312	397
$\hat{\gamma}_{trade}^{employee}$	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)
R^2	0.929	0.765	0.704	0.854
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Table: Migration & composition of tax revenues: OECD-Time-Split

	OECD '80-'93	OECD '94-'07	NonOECD '80-'93	NonOECD '94-'07
$\hat{\gamma}_{mig}^{total}$	-0.602 (1.318)	1.036 (0.959)	-3.761** (1.644)	-0.691 (0.554)
R^2	0.974	0.971	0.902	0.932
Obs	353	364	385	473
$\hat{\gamma}_{mig}^{corp}$	-1.050 (0.654)	0.062 (0.883)	1.155 (1.048)	0.294 (0.345)
R^2	0.971	0.918	0.855	0.867
Obs	330	350	312	397
$\hat{\gamma}_{mig}^{employee}$	-0.375 (0.616)	-0.206 (0.948)	-0.488 (0.472)	-0.049 (0.218)
R^2	0.961	0.922	0.954	0.953
Obs	338	350	316	389
$\hat{\gamma}_{mig}^{goods}$	1.208** (0.628)	0.136 (0.407)	1.869*** (0.612)	-0.861** (0.351)
R^2	0.944	0.950	0.905	0.826
Obs	353	364	366	451
$\hat{\gamma}_{mig}^{other}$	0.194 (0.287)	0.799 (0.401)	-6.860*** (1.905)	-0.387 (0.415)
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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
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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: Trade

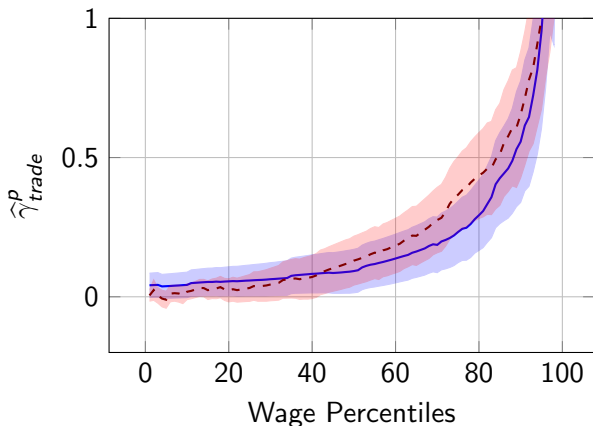


Figure: ESTIMATED COEFFICIENT & 10% CONFIDENCE BANDS

Percentile Shares in OECD, '94-'07: Trade

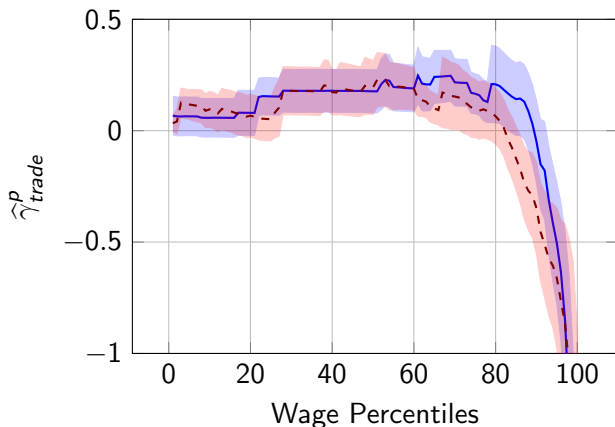


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Percentile Shares in non-OECD: Trade

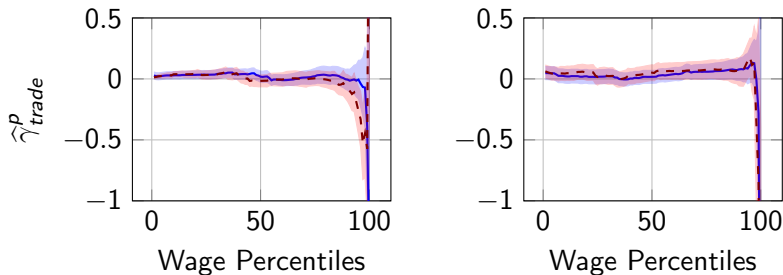


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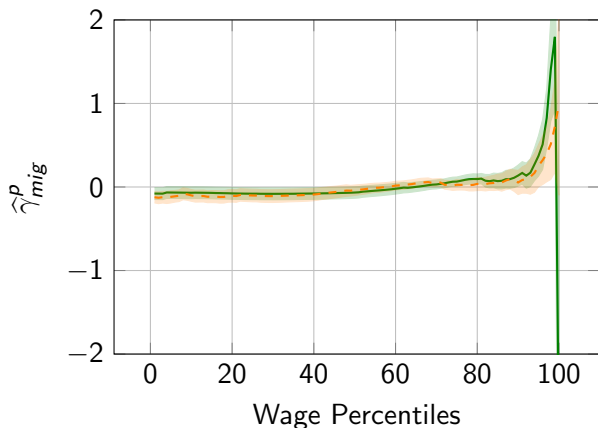


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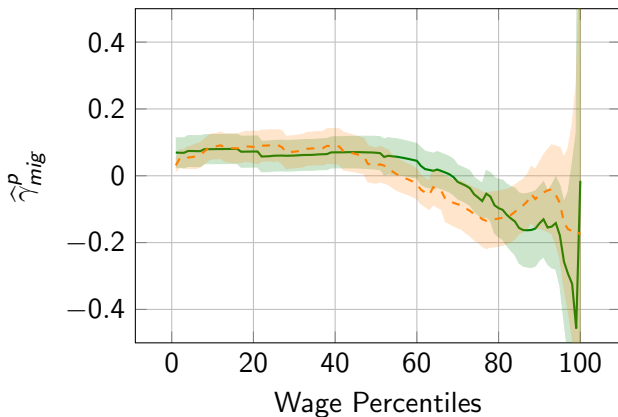


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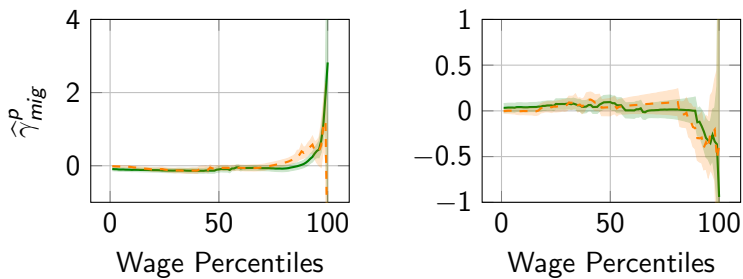


Figure: ESTIMATED COEFFICIENT & 10% CONFIDENCE BANDS

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

$$100 \times \tau_{i,t}^P = \text{const}^P + \xi^P \ln(\pi_{i,t}) + \Gamma^P Z_{i,t} + \lambda_t^P + \mu_i^P + u_{i,t}^P$$

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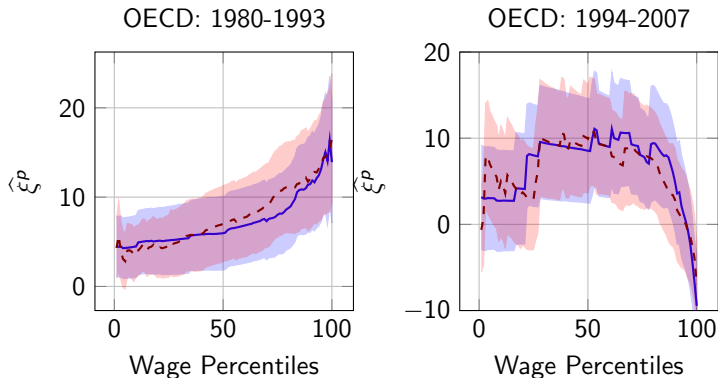


Figure: PERCENTILE-SPECIFIC TAX RATES: TRADE

Estimated effect on individual tax rates

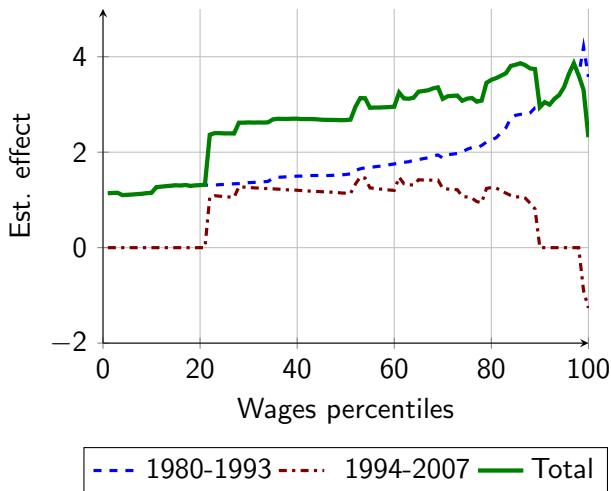


Figure: THE EFFECT OF OPENNESS ON TAX RATES FOR AN AVERAGE OECD COUNTRY

Case Study: United States

We expect similar reactions to openness in federal states with subnational taxation:

- ▶ We use the Annual Social and Economic (ASEC) supplement to the Current Population Survey (CPS) provided by the Integrated Public Use Microdata Series (IPUMS) data on taxes paid and wages across states
- ▶ Use migration data from the Internal Revenue Service (returns, number of people, gross income)
- ▶ Controls identical to cross-country setting
- ▶ All 50 states between 2000 and 2007

State taxes

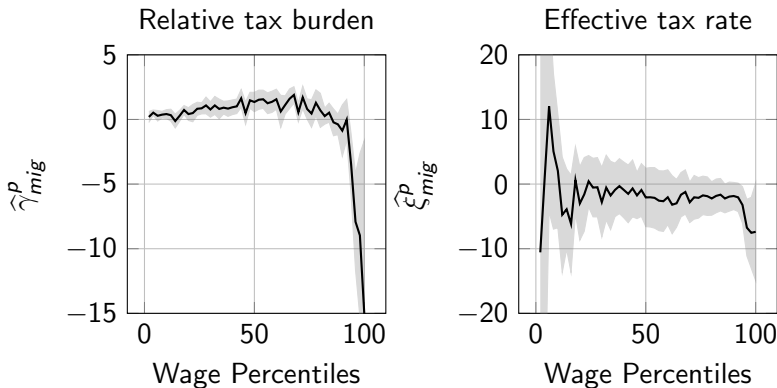


Figure: REGRESSION COEFFICIENTS IV-GMM: STATE-TO-STATE MIGRATION AND PERCENTILE-SPECIFIC STATE TAX OUTCOMES

Federal & State taxes

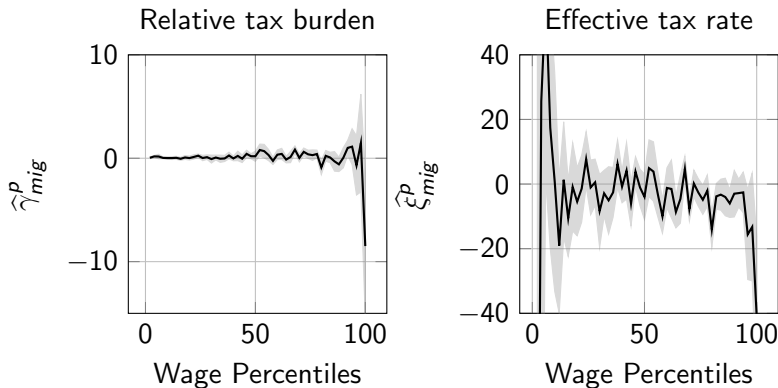


Figure: REGRESSION COEFFICIENTS IV-GMM: STATE-TO-STATE MIGRATION AND PERCENTILE-SPECIFIC TOTAL TAX OUTCOMES

Employee-borne Tax Revenue: Actual vs. Prediction

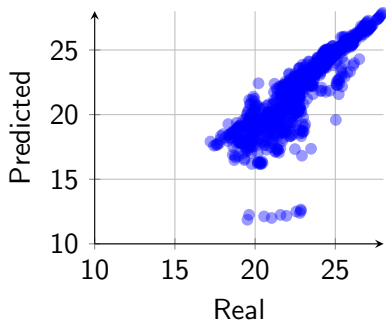


Figure: EMPLOYEE-BORNE TAX REVENUES IN LOGS

Luxembourg Income Study

In our main regressions we use parametric assumptions on the earnings distribution.

Correlations:

	Overall	Range
Distribution	Correlation	across years
Pareto	0.895	0.789 to 0.998
Log-normal	0.915	0.782 to 0.997

Luxembourg Income Study

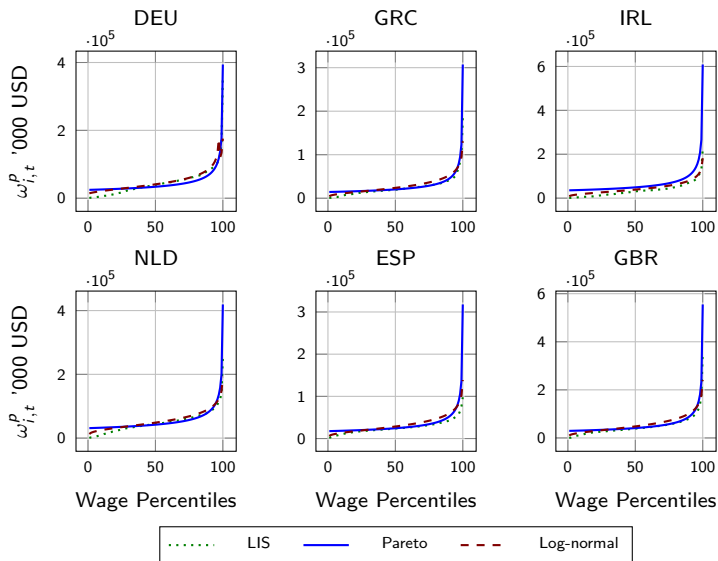


Figure: LIS AND IMPUTED INCOME PERCENTILES: 2007

Luxembourg Income Study

Are results robust to using actual income distribution?

Luxembourg Income Study

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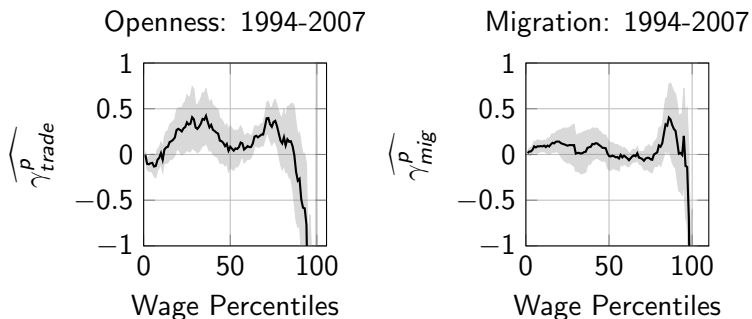


Figure: REGRESSION COEFFICIENTS: LIS AND PARETO FOR OECD COUNTRIES

Thank you!