

# Effective Labour Taxation and the International Location of Headquarters

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## Agenda

- Motivation
- Literature
- Database
- Summary Statistics
- Econometric Model
- Results
- Conclusions

## Motivation (1)

- Location of firms' headquarters is key for economies (capturing value added ; knowledge creation ; ideas).
- Governments use host of instruments to attract enterprises.
- Previous work on firm location emphasized role of profit taxation, but not income taxation issues.
- However, focus on corporate taxes may be insufficient because
  - ① capital and skilled workers are largely complementary in production ;
  - ② skilled workers and employees are relatively mobile across international borders ;
  - ③ profit tax base can be easily manipulated but not/less so the labour income tax base.

## Motivation (2)

- E.g., Procter & Gamble, McDonalds, Kraft have relocated their European headquarters from England to Switzerland.
- Survey by Braunerhjelm & Lindquist (1999) based on interviews with the 50 largest corporations in Sweden suggests income taxes matter.
- Labour income tax issues are multi-faceted : progressivity of income tax ; employee- and employer-borne social security contributions. What's their effect on firm location ?
- Will proposed income tax reforms in France (75% rate on top earners) and the US affect headquarters locations ?

## Literature :

### Location of headquarters :

- Bel & Fageda (2008)
- Davis & Henderson (2008)
- Strauss-Kahn & Vives (2009)

### Labour taxation and headquarters :

- Egger & Radulescu (2011)

## Taxation :

- 120 countries of which 79 are used for estimation.
- PWC, Ernst & Young, KPMG, OECD, IRS, U.S. Social Security Administration, and many more.

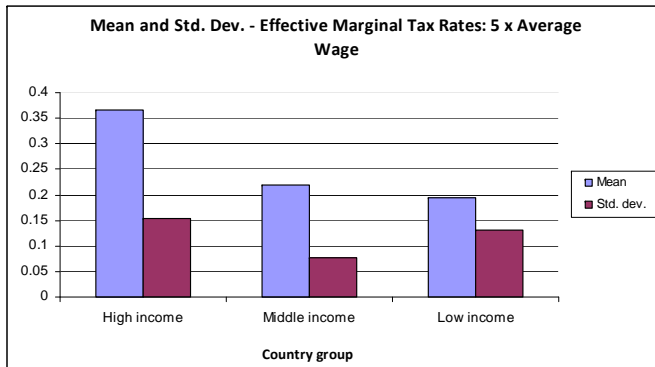
*AvgTaxRate* : Average tax rate.

*Prog500* : Progressivity of tax schedule.

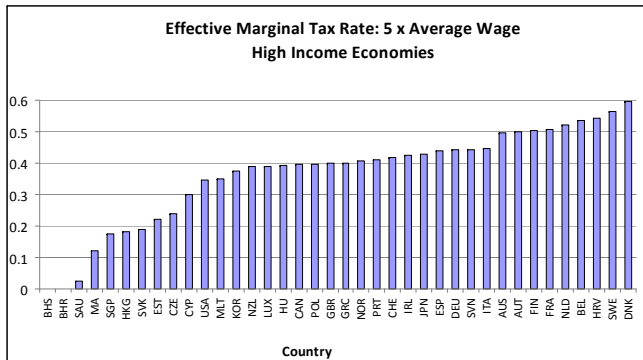
$SSC_{ee}$  : Employee-borne social security contributions.

$SSC_{er}$  : Employer-borne social security contributions.

## Comparison of Eff. Marg. Tax Rates - 5x Avg. Wage

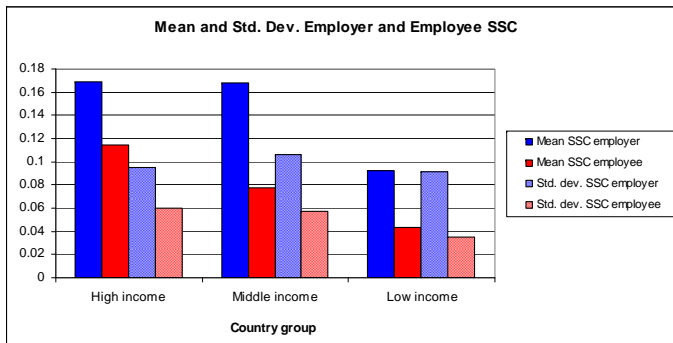


## Comparison of Eff. Marg. Tax Rates - 5x Avg. Wage

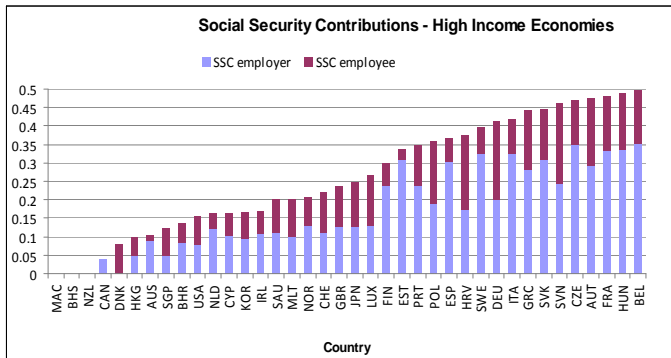




## Comparison of Social Security Contributions



## Comparison of Social Security Contributions



## Other Data Sources :

### Headquarters Location Data :

- Compustat
- 35,206 firms & their headquarters locations.
- 27,328 located in high-income, 5,252 in middle-income economies, 2,551 in low-income countries.

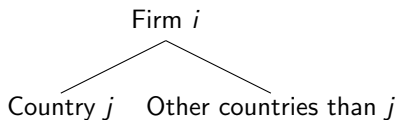
### Control Variables :

- GDP, capital stock, share of the population with tertiary education, gross salary, number of international flights.
- Data come from the World Bank, United Nations, Laborsta.

## Summary Statistics - All Countries

	Mean	Std.dev.	Median	Max	Min
	(1)	(2)	(3)	(4)	(5)
<i>AvgLabTax</i>	0.103	0.071	0.108	0.363	0.000
<i>Prog500</i>	0.155	0.071	0.143	0.432	0.000
<i>SSC<sub>er</sub></i>	0.110	0.065	0.095	0.372	0.000
<i>SSC<sub>ee</sub></i>	0.075	0.048	0.071	0.300	0.000
<i>CorpTax.</i>	0.324	0.067	0.331	0.411	0.000
<i>GDP(mn.US\$)</i>	3,884,000	4,688,000	2,470,000	13,720,000	3,418
<i>CapStock(mn.US\$)</i>	5,283,000	5,862,000	2,640,000	16,410,000	8,060
<i>TertEdu</i>	0.589	0.131	0.588	0.858	0.167
<i>Wage</i>	34,386	18,103	40,135	66,851	20

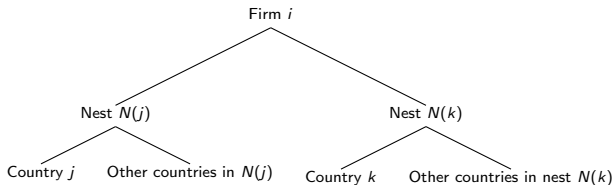
## Conditional Logit Model - McFadden (1974)



$$\text{Utility : } V_{ij} = V(\text{Loc}_{ij} = 1 | x_j) = \beta x_j'$$

$$\text{Probability : } Pr(\text{Loc}_{ij} = 1 | x_j) = \frac{e^{\beta x_j'}}{\sum_{l=1}^J e^{\beta x_l'}}, \forall l = 1, \dots, J : j \neq l$$

## Nested Logit Model



$$\text{Utility : } V_{ij} = V(\text{Loc}_{ij} = 1 | x_j, w_n) = \beta x'_j + \delta_n w'_n$$

$$\text{Prob. : } Pr(\text{Loc}_{ij} = 1 | x_j) = \underbrace{Pr(\text{Loc}_{ij} = 1 | x_j \in N(j))}_{Pr(\text{choose } j \text{ among } N(j))} \times \underbrace{Pr(j \in N(j))}_{Pr(\text{choose nest } N(j))}$$

## Semi-elasticities (1)

	Conditional logit				
	<i>AvgLabTax</i>	<i>Prog500</i>	<i>SSC<sub>er</sub></i>	<i>SSC<sub>ee</sub></i>	<i>CorpTax</i>
All firms	-0.017 ***	-0.009 ***	-0.055 ***	-0.022 ***	-0.010 ***
Relocated firms	-0.082 ***	-0.068 ***	-0.122 ***	0.038 *	-0.029 **
New firms & relocations	-0.061 ***	-0.064 ***	-0.068 ***	0.023 **	-0.030 ***

Notes : We control for GDP, CapStock, TertEdu, Wage, Legal Rights, and three interaction terms Wage  $\times$  TertEdu, CapStock  $\times$  GDP, Wage  $\times$  GDP.

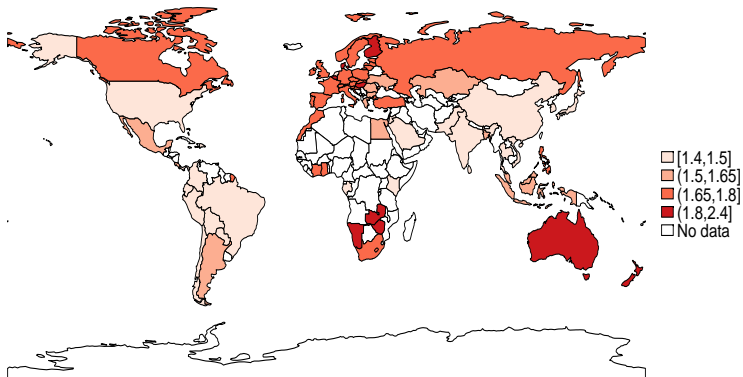
## Semi-elasticities (2)

		Nested logit				
		<i>AvgLabTax</i>	<i>Prog500</i>	<i>SSC<sub>er</sub></i>	<i>SSC<sub>ee</sub></i>	<i>CorpTax</i>
Income nesting	<i>Mean</i>	-0.036 ***	-0.023 ***	-0.064 ***	-0.016 ***	-0.009 ***
	<i>High income</i>	-0.028	-0.018	-0.049	-0.012	-0.007
	<i>Middle income</i>	-0.044	-0.029	-0.080	-0.020	-0.012
	<i>Low income</i>	-0.044	-0.027	-0.072	-0.018	-0.012
Region nesting	<i>Mean</i>	-0.022 ***	-0.012 ***	-0.046 ***	-0.016 ***	-0.001
	<i>The Americas</i>	-0.020	-0.012	-0.046	-0.016	-0.001
	<i>Europe</i>	-0.026	-0.015	-0.057	-0.020	-0.001
	<i>RoW</i>	-0.018	-0.010	-0.036	-0.013	-0.001
Distance nesting	<i>Mean</i>	-0.011 ***	-0.007 ***	-0.045 ***	-0.022 ***	-0.012 ***
	<i>Near</i>	-0.013	-0.008	-0.053	-0.025	-0.013
	<i>Middle</i>	-0.011	-0.007	-0.041	-0.021	-0.012
	<i>Far</i>	-0.009	-0.006	-0.038	-0.019	-0.010

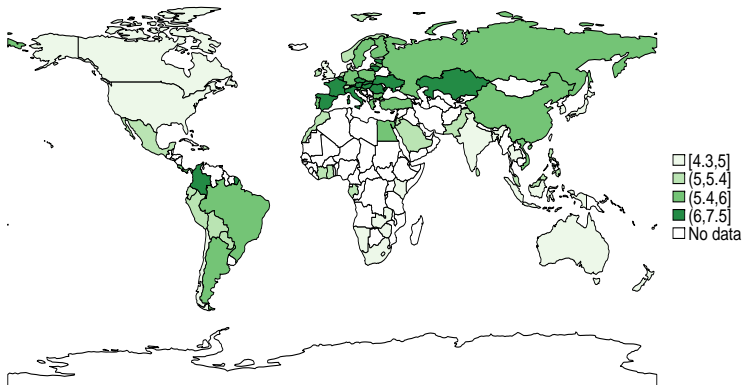
Notes : We control for GDP, CapStock, TertEdu, Wage, Legal Rights, and three interaction terms Wage  $\times$  TertEdu, CapStock  $\times$  GDP, Wage  $\times$  GDP.



## Semi-elasticities - Average Effective Labor Income Tax



# Semi-elasticities - Employer Social Security Contributions



## Conclusion

- Conditional probability of a country being chosen as headquarters location is negatively affected by :
  - average labor income tax ;
  - progressivity of tax system ;
  - employer-borne social security contributions ;
  - employee-borne social security contributions.
- Economic tax incidence is not independent of who bears tax burden. Effects of employer-borne social security contributions are biggest.
- Lesser role of corporate tax for headquarters location.

## Summary Statistics - High Income Economies

	Mean	Std.dev	Median	Max	Min
	(1)	(2)	(3)	(4)	(5)
<i>AvgLabTax</i>	0.123	0.065	0.150	0.293	0.000
<i>Prog500</i>	0.163	0.075	0.164	0.432	0.000
<i>SSC<sub>er</sub></i>	0.111	0.057	0.095	0.276	0.006
<i>SSC<sub>ee</sub></i>	0.085	0.045	0.081	0.300	0.014
<i>CorpTax.</i>	0.329	0.072	0.334	0.411	0.125
<i>GDP, mil.</i>	4,648,000	5,020,000	2,470,000	13,720,000	6,587
<i>CapStock, mil.</i>	6,305,000	6,200,000	2,640,000	16,410,000	8,060
<i>TertEdu</i>	0.626	0.102	0.639	0.858	0.259
<i>Wage</i>	42,688	10,331	44,723	66,851	7,008

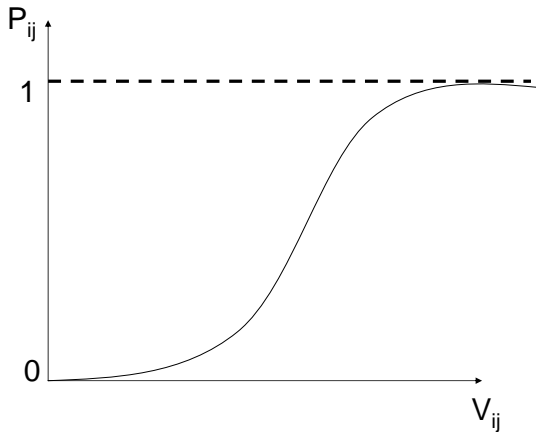
## Summary Statistics - Low Income Economies

	Mean	Std.dev.	Median	Max	Min
	(1)	(2)	(3)	(4)	(5)
<i>AvgLabTax</i>	0.031	0.153	0.045	0.363	0.012
<i>Prog500</i>	0.147	0.049	0.100	0.148	0.026
<i>SSC<sub>er</sub></i>	0.026	0.009	0.013	0.022	0.000
<i>SSC<sub>ee</sub></i>	0.012	0.009	0.013	0.022	0.000
<i>CorpTax.</i>	0.336	0.004	0.300	0.309	0.300
<i>GDP, mil.</i>	756,600	447,300	1,107,000	1,107,000	3,418
<i>CapStock, mil.</i>	1,013,000	632,000	1,512,000	1,512,000	9,733
<i>TertEdu</i>	0.349	0.069	0.313	0.814	0.199
<i>Wage</i>	1,392	1,286	913	8,547	20

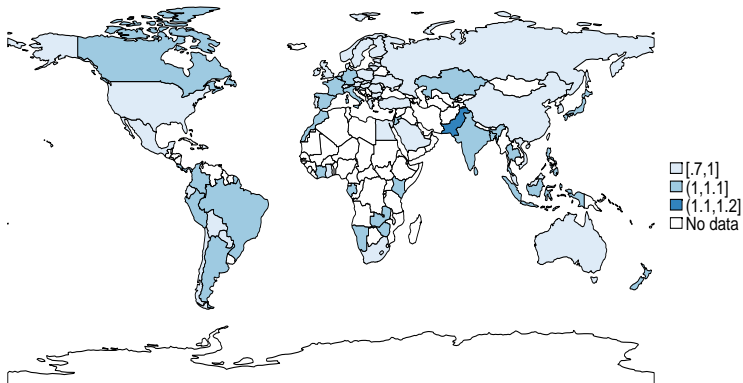
## Semi-elasticities - Conditional Logit - Sensitivity Analysis

	Relocated firms					New & relocated firms				
	Avg LabTax	Prog 500	$SSC_{er}$	$SSC_{ee}$	Corp Tax	AvgLabTax	Prog 500	$SSC_{er}$	$SSC_{ee}$	Corp Tax
High inc. tax	-0.037 ***	-0.032 ***	-0.104 ***	-0.057 **	-0.047 ***	-0.025 ***	-0.043 ***	-0.085 ***	0.001	-0.049 ***
High inc. tax High skilled	-0.025 **	-0.038 ***	-0.110 ***	-0.052 *	-0.044 ***	-0.013 *	-0.046 ***	-0.092 ***	-0.013	-0.049 ***
High inc. tax Low skilled	-0.077 ***	-0.016	-0.098 ***	-0.064	-0.047 **	-0.050 ***	-0.034 ***	-0.073 ***	0.026	-0.050 ***

## Graphic - Logit Model



## Semi-elasticities - Corporate Tax





$$AvgTaxRate = \frac{PIT + SSC_{ee} + SSC_{er}}{Gross\ Wage + SSC_{er}} \quad (1)$$

## Nested logit - Number of Countries and Number of Firms According to Classification

### Distance classification

- 0-7000km : 36 countries, 10,330 firms.
- 7000-9000km : 19 countries, 9,490 firms.
- > 9000km : 24 countries, 15,386 firms.

### Region classification

- Europe : 31 countries, 9,946 firms.
- The Americas : 16 countries, 7,954 firms.
- Rest of the World : 32 countries, 17,306 firms.