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Host Country Tax Policy and Foreign Funded R&D

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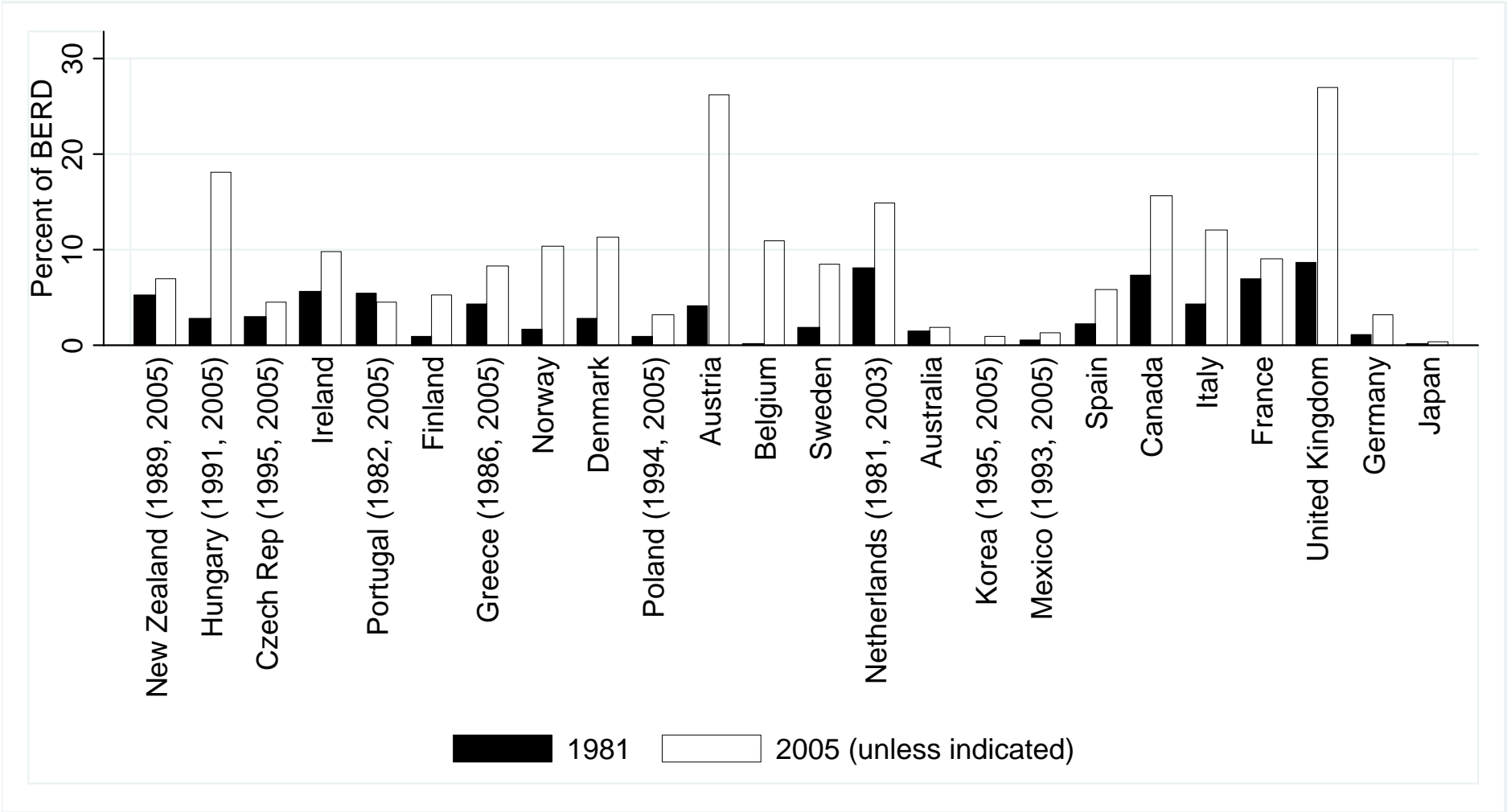
TAX INCENTIVES AND R&D

- Broad consensus that tax policy is effective in inducing domestic / total BERD
- Are firms that operate across international borders different?
 - Tax treatment of repatriated profits can ‘wash out’ the incentive effect of tax credits.
 - Other tax considerations (e.g., royalties)
- Limited evidence, no consensus:
 - Athukorala & Kohpaiboon (2006); Bloom and Griffith (2001) Hines and Jaffe (2001)

DEFINITION OF FOREIGN FUNDED R&D

- Transfer that is both “intended and used for the performance of R&D” (Frascati)
- I.e., cross-border R&D contracting between:
 - MNE affiliate and parent; and
 - unaffiliated firms (international outsourcing)
- **Distinct from R&D activity of foreign owned firms (most of which is funded through “own funds”)**
- **Does not include foreign sourced loans, equity, venture capital etc**

TRENDS IN FOREIGN FUNDED R&D



OECD Main Science and Technology Indicators

TAX POLICY VARIABLE

Tax component of user cost of R&D (tax price) (Jorgenson 1963)

$$b_{it} = \frac{1 - A_{it}}{1 - \tau_{it}}$$

The required pre-tax rate of return:

- A = NPV of reductions to tax arising from one dollar invested in R&D (credits, deductions, accelerated depreciation etc).
- τ = Corporate Income Tax rate (CIT)

Calculated for >20 OECD countries from 1980 to 2005.

Policies specific to foreign funded R&D.

ESTIMATING EQUATION

$$FFRD_{it} = \rho FFRD_{it-1} + \beta_0 GDP_{it-1} + \beta_1 b_{it} + \beta_2 LC_{it} + \beta_3 IPR_{it} + \beta_4 HERD_{it-1} + \beta_5 FDIS_{it} + \lambda_t + \alpha_i + \varepsilon_{it}$$

FFRD R&D financed from abroad at host country level (OECD MSTI).

GDP (WDI)

LC Labour costs: total labour compensation rate (OECD Outlook)

b tax price of R&D

IPR Strength of intellectual property rights (Park 2008)

HERD R&D performed by the higher education sector (OECD MSTI)

(Also considered: scientific journal article publications (NSF))

FDIS foreign direct investment stock (OECD Outlook)

* all \$ values in real (2005) USD (market rates)

RESULTS

	FE	FE	Kievit
$FFRD_{t-1}$	0.663*** (0.0433)	0.672*** (0.0417)	0.73*** (0.058)
b_t	-1.177*** (0.440)	-1.168** (0.460)	-1.091** (0.506)
LC_t	0.0709 (0.212)	0.0405 (0.206)	0.0544 (0.243)
GDP_{t-1}	0.421 (0.365)	0.342 (0.355)	0.330 (0.433)
$HERD_{t-1}$	-0.105 (0.163)		-0.105 (0.201)
SJA_{t-1}		-0.0570 (0.146)	
IPR_{t-1}	0.0578 (0.381)	-0.0134 (0.346)	0.0443 (0.464)
$FDIS_{t-1}$	0.147*** (0.0538)	0.153*** (0.0526)	0.131* (0.0700)
Obs	324	326	324
No. cn	20	20	20
Rho	0.48	0.45	-

CONCLUDING REMARKS

- R&D financed from abroad small but growing share of BERD
- First attempt to explain this using cross country data
- Presence of foreign firms a key determinant of foreign funded R&D
- Host country tax policy also appears affective
- A better measure of R&D wages might improve model

Thank-you