

Innodrive Workshop

Czech Republic Micro-Approach Update

DIW

Berlin

September, 2010

Two papers with similar identification

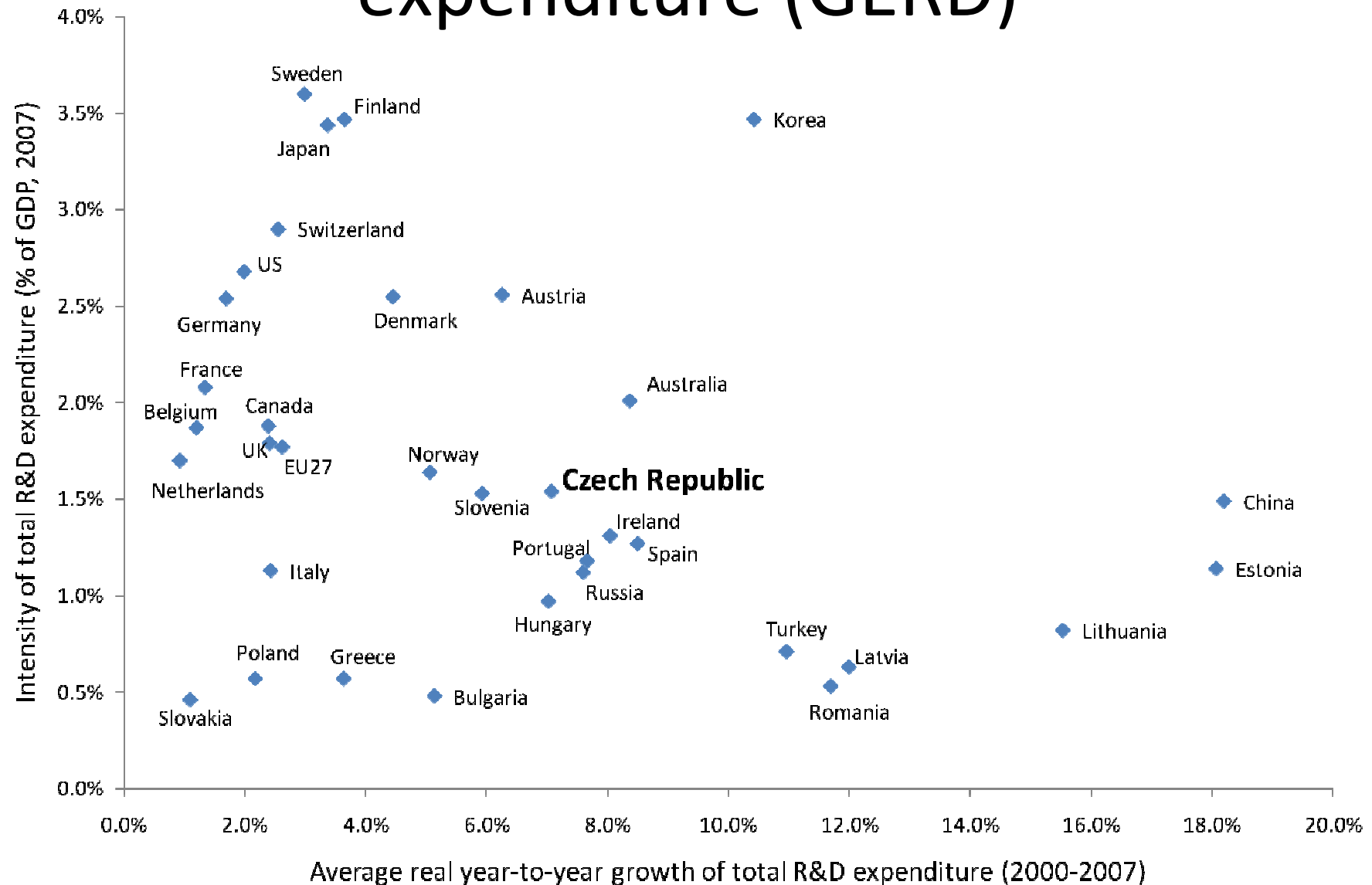
1. Wage spillovers from high concentration of college educated. Using 2000 census shares. Now collecting current % of college-educated so a fixed-effect regression could be run.
2. Relative productivity (and wages) of organizational workers.

Both strategies need an IV.

Org. Capital in Czech lands

- Based on aggregate data Jona-Lasinio and Iommi (2010) suggest that the Czech Republic, Slovakia and Hungary have the highest growth in the EU in the share of intangibles in GDP and the highest impact of intangibles on labor productivity growth during 1995 to 2005. 'Organizational capital' is responsible for almost a third of the 'new' intangibles.
- No micro-data evidence up to now. Little work on organization structure or executive comp.

International comparison of total R&D expenditure (GERD)



Czech available data and variables

- ISAE: LEED data: 2000-07: wages, ISCO4, NUTS4
- Aspekt: Balance sheets 1999-2006: VA (Sales), SC, Assets
- => Merged LEED-Balance sheet for OC regressions

• Share o

	Aspekt	ISAE	merged	sets
1999	9 337		842	
2000	11 097	2 095	921	
2001	14 361	2 640	890	
2002	35 879	3 086	833	
2003	59 366	3 006	823	
2004	73 867	3 596	966	
2005	66 360	4 073	1 174	
2006	42 150	2 997	935	
2007		3 579		

Summary statistics

	Mean	Std	Median	N
Value Added	10200	47181	2102	7244
log(VA)	7.8	1.6	7.7	7028
Staff Costs	6593	33395	1890	7384
log(SC)	7.7	1.4	7.6	7189
OCshare	0.094	0.135	0.054	7374
MNGshare	0.089	0.131	0.050	7374
MKTshare	0.006	0.019	0.000	7374
OC-RelatWage	0.133	0.121	0.104	7381
MNG-RelatWage	0.127	0.118	0.099	7381
MKT-RelatWage	0.006	0.019	0.000	7381
Tangible FA	26828	180693	3082	7249
Hours	817003	3335597	314585	7384
RDasset	3028	13893	521	7384
RDshare	.088	.085	.077	7374

Regressions

- Data from LEED: R&D “assets”, OC share
- Balance sheet: value added, staff costs, fixed assets
- about 7000 year-firm observations in panel

$$\log VA_{it} = b_0 + b_1 \log L_{it} + b_2 \frac{OC_{it}}{L_{it}} + b_4 \log RND_{it} + b_5 \log PPE_{it} + \varepsilon_{it}$$

- + NACE_year dummies
- productivity gap = $b_2/b_1 + 1$

Endogeneity of org. share input:

- The denominator (employment or hours) may be pos. correlated with productivity shocks;
- org. input measured with error because of hours differences or as quality of org. workers may be inversely related to share, so
=> downward bias.
- Exogenous source of variation in inputs? We rely on the historical location of college education across NUTS-4. Only cross-section variation. Only makes sense to IV for college org. workers.

Value added

	RE	FE	OLS (2005)	IV (2005)
coll91				0.060*** (0.013)
F				22.22
const	-1.100*** (0.353)	2.702*** (0.508)	-4.322*** (0.311)	-6.488*** (0.784)
ocshare	0.335** (0.161)	-0.095 (0.180)	1.482*** (0.284)	8.836*** (1.987)
lntanfa	0.242*** (0.017)	0.159*** (0.024)	0.151*** (0.020)	0.100*** (0.037)
lnemp	0.528*** (0.034)	0.304*** (0.040)	0.856*** (0.035)	1.002*** (0.071)
lnrndasset	0.027*** (0.009)	-0.009 (0.013)	0.045*** (0.010)	0.082*** (0.018)
dummies	year*sector	year*sector	sector	sector
N	6975	6975	1110	1105
chi2	12313.718			
F		84.912	422.643	253.946
r2		0.248	0.828	0.619

Robustness checks

- More detailed NACE makes coeff. a bit smaller
- IV validity: drop greenfields, 'young' industries
- $ICT * OC$ (Brynjolfson et al., 2002) = 0
- Using Input-Output tables to exclude industries outsourcing R&D, marketing, ICT
- Adding admin back into org. group
- Overall, not much sensitivity. Certainly not reducing the large cross-sectional estimate.

To Do

- IV only college-educated org. workers
- Follow Ilmakunnas and Maliranta (2005) and allow the K and L coefficients to vary by NACE2.
- Try the share of women to see if results are comparable to existing studies.
- Plot the wage/productivity gap by industry.

Problems:

- Given the huge relative productivity, the linear approximation no longer works.
- Perfect substitution assumption problematic too.

Staff costs

	RE	FE	OLS (2005)	IV (2005)
coll91				0.054*** (0.013)
F				18.04
const	-1.946*** (0.316)	1.842*** (0.492)	-4.278*** (0.197)	-6.442*** (0.705)
ocshare	0.422*** (0.137)	0.071 (0.153)	1.031*** (0.209)	7.401*** (1.745)
lntanfa	0.167*** (0.014)	0.139*** (0.021)	0.052*** (0.010)	-0.015 (0.031)
lnemp	0.605*** (0.031)	0.349*** (0.038)	0.906*** (0.020)	1.072*** (0.064)
lnrndasset	0.025*** (0.007)	-0.003 (0.012)	0.029*** (0.008)	0.057*** (0.015)
dummies	year*sector	year*sector	sector	sector
N	7132	7132	1135	1130
chi2	73749.816			
F		211.496	757.314	348.161
r2		0.526	0.893	0.673

Value added

	without Prague		without greenfields		without Prague & greenfields	
	RE	IV (2005)	RE	IV (2005)	RE	IV (2005)
coll91		0.048*** (0.016)		0.052** (0.013)		0.045*** (0.017)
F		8.39		16.43		7.40
const	-1.127*** (0.371)	-5.576*** (0.829)	-0.947*** (0.357)	-6.875*** (0.935)	-0.994*** (0.377)	-5.871*** (0.973)
ocshare	0.238 (0.185)	4.764** (2.139)	0.281* (0.161)	9.061*** (2.387)	0.209 (0.186)	5.400** (2.454)
lntanfa	0.245*** (0.018)	0.112*** (0.030)	0.243*** (0.017)	0.055 (0.041)	0.243*** (0.018)	0.101*** (0.034)
lnemp	0.519*** (0.037)	0.952*** (0.071)	0.513*** (0.035)	1.059*** (0.084)	0.508*** (0.037)	0.981*** (0.083)
lnrndasset	0.041*** (0.009)	0.065*** (0.015)	0.030*** (0.009)	0.088*** (0.020)	0.043*** (0.010)	0.062*** (0.016)
dummies	year*sector	sector	year*sector	sector	year*sector	sector
N	6040	940	6616	1034	5797	892
chi2	16867.932		17295.394		15758.616	
F		332.181		198.180		275.559
r2		0.813		0.601		0.791

Staff costs

	without Prague		without greenfields		without Prague & greenfields	
	RE	IV (2005)	RE	IV (2005)	RE	IV (2005)
coll91		0.043*** (0.016)		0.046** (0.013)		0.041** (0.016)
F		7.02		13.01		6.10
const	-2.029*** (0.335)	-5.700*** (0.829)	-1.856*** (0.320)	-6.696*** (0.891)	-1.898*** (0.342)	-5.819*** (0.985)
ocshare	0.151 (0.161)	4.857** (2.036)	0.289** (0.136)	7.680*** (2.192)	0.121 (0.164)	5.200** (2.326)
lntanfa	0.162*** (0.014)	0.006 (0.031)	0.169*** (0.014)	-0.045 (0.040)	0.162*** (0.015)	-0.004 (0.037)
lnemp	0.605*** (0.033)	1.016*** (0.073)	0.596*** (0.031)	1.109*** (0.082)	0.595*** (0.034)	1.031*** (0.088)
lnrndasset	0.038*** (0.008)	0.048*** (0.012)	0.025*** (0.008)	0.062*** (0.017)	0.038*** (0.008)	0.046*** (0.013)
dummies	year*sector	sector	year*sector	sector	year*sector	sector
N	6159	963	6771	1059	5916	915
chi2	81352.949		31155.669		76247.473	
F		467.516		1117.178		414.466
r2		0.837		0.637		0.813

Organiz. capital (compensation based) by NACE: new formula

