Using micro and macro data for policy research

Eric Bartelsman*

September 21, 2012

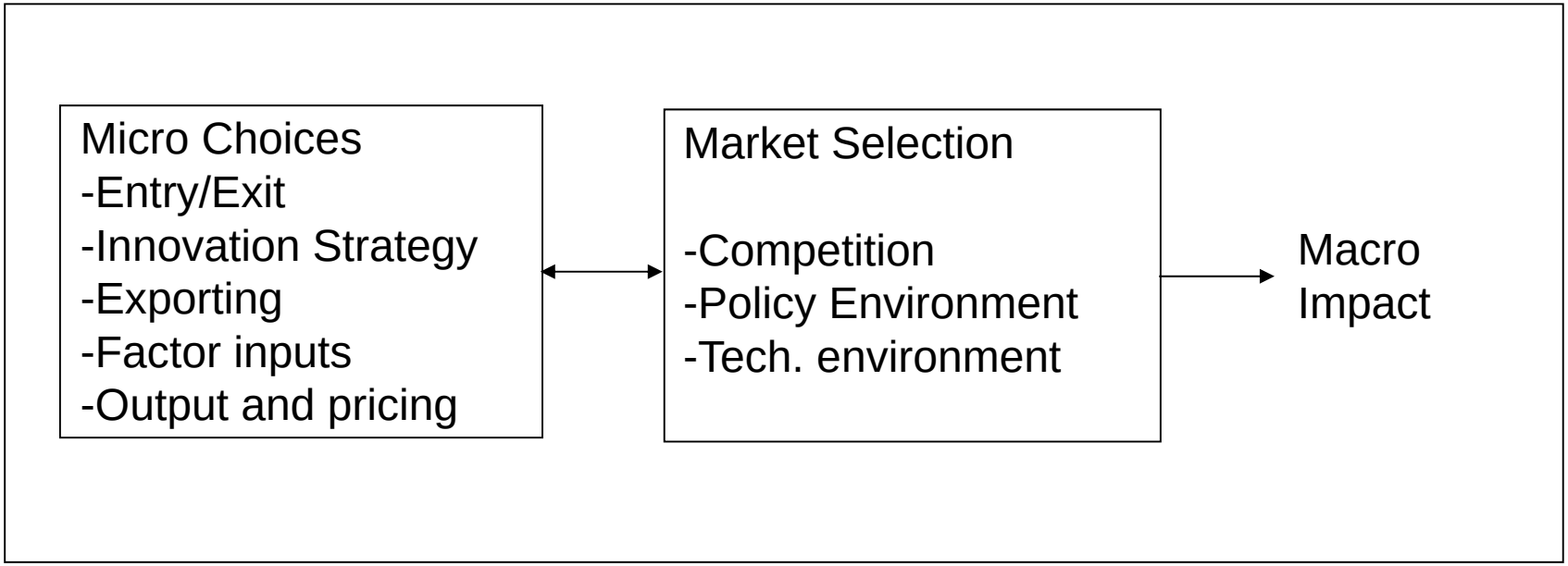
CompNet, Banque de France

*Vrije Universiteit Amsterdam; Tinbergen Institute;.IZA.

Outline

- Policy Questions
  - Data and research to inform decisions
- Data Availability
  - Look for the lamp-posts, then look under them (instead of assuming there is light)
- Methodology
  - Dependent on question
- Examples

Micro to Macro



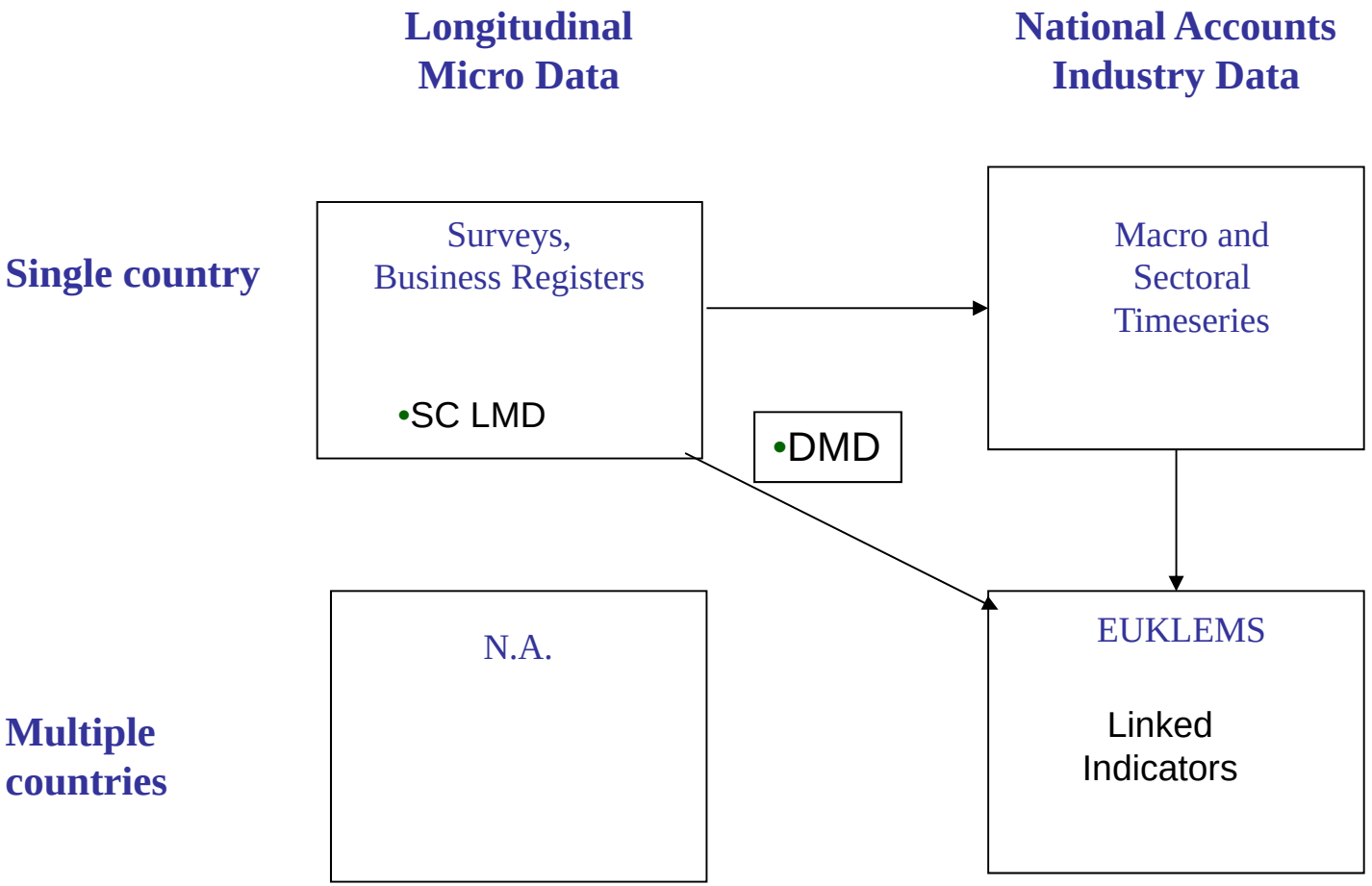
Policy Questions

- Long-run Aggregate Productivity Growth
  - What are drivers
  - Policy evaluation (Structural, Financial, Targetted)
- Medium-term Potential Output Growth
  - Forecasting Trend Productivity
- Competitiveness (External Balance)
  - Can firms ‘compete’
  - Firm growth conditional on productivity
- Resilience
  - Stress-testing the real economy

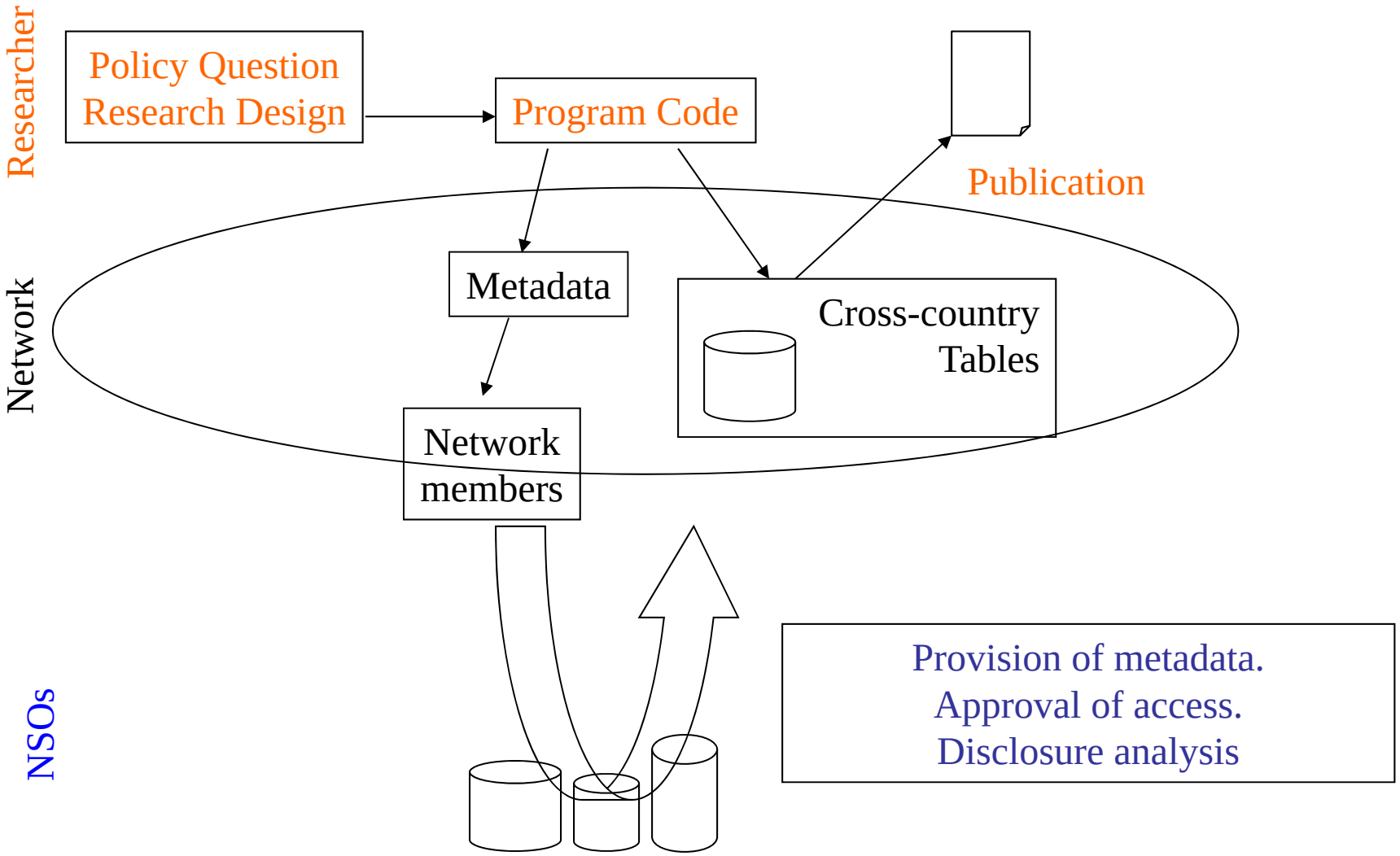
Firm-level, cross-country comparisons

- Policy environment affects all firms in country (and industry) in the same manner
- Cross-country firm-level comparisons may provide means to observe/identify the impacts of policy changes through the three paths:
  - Allocation of resources across firms
  - Selection (entry/exit)
  - Choice of firm strategy (investment, innovation, export)

From firm data to macro indicators



Distributed Micro Data Analysis



EuroStat Project

- Data sources:
  - Data underlying National Accounts
  - 15 EU countries, 2000-2009
  - Coverage in 15t37, 50t74, 91t3
  - Linked firm-level files
    - Business Register
    - Production Stats (SBS)
    - E-commerce Survey
    - Community Innovation Survey (CIS)
    - Long Panel (1990-2009)

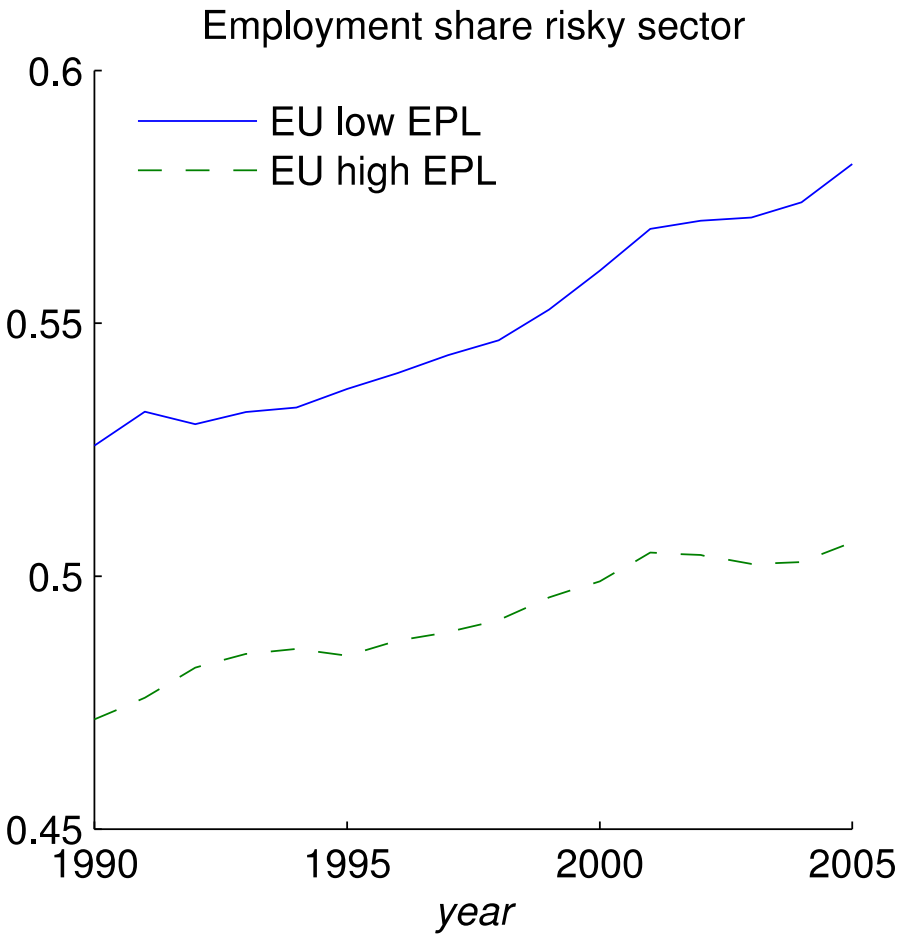
Cross-Country Output Datasets

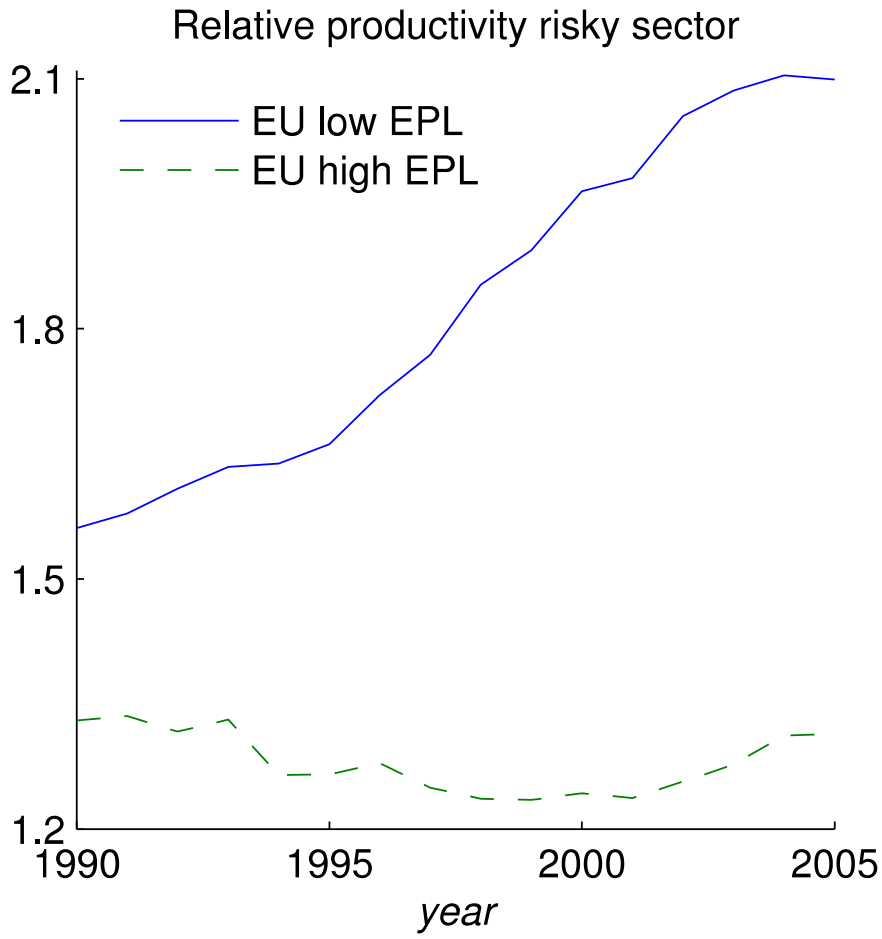
- Tabulations (c,i,t), with industry splits
  - eg: output for exporting/non-exporting firms; gazelles, mnc, foreign-owned, innovative, ICT-intensive
- Firm Demographics (entry/exit, JC, JD, size distr)
- Industry Dynamics
  - OP Cross term, Prod Decompositions, Prod Variances, Churn, Boone indicator
- Means, variances, co-variances by quartile of distributions
- Regression output
  - Prod function w. human capital, ICT, innovation
  - Export selection and intensity

Methodology

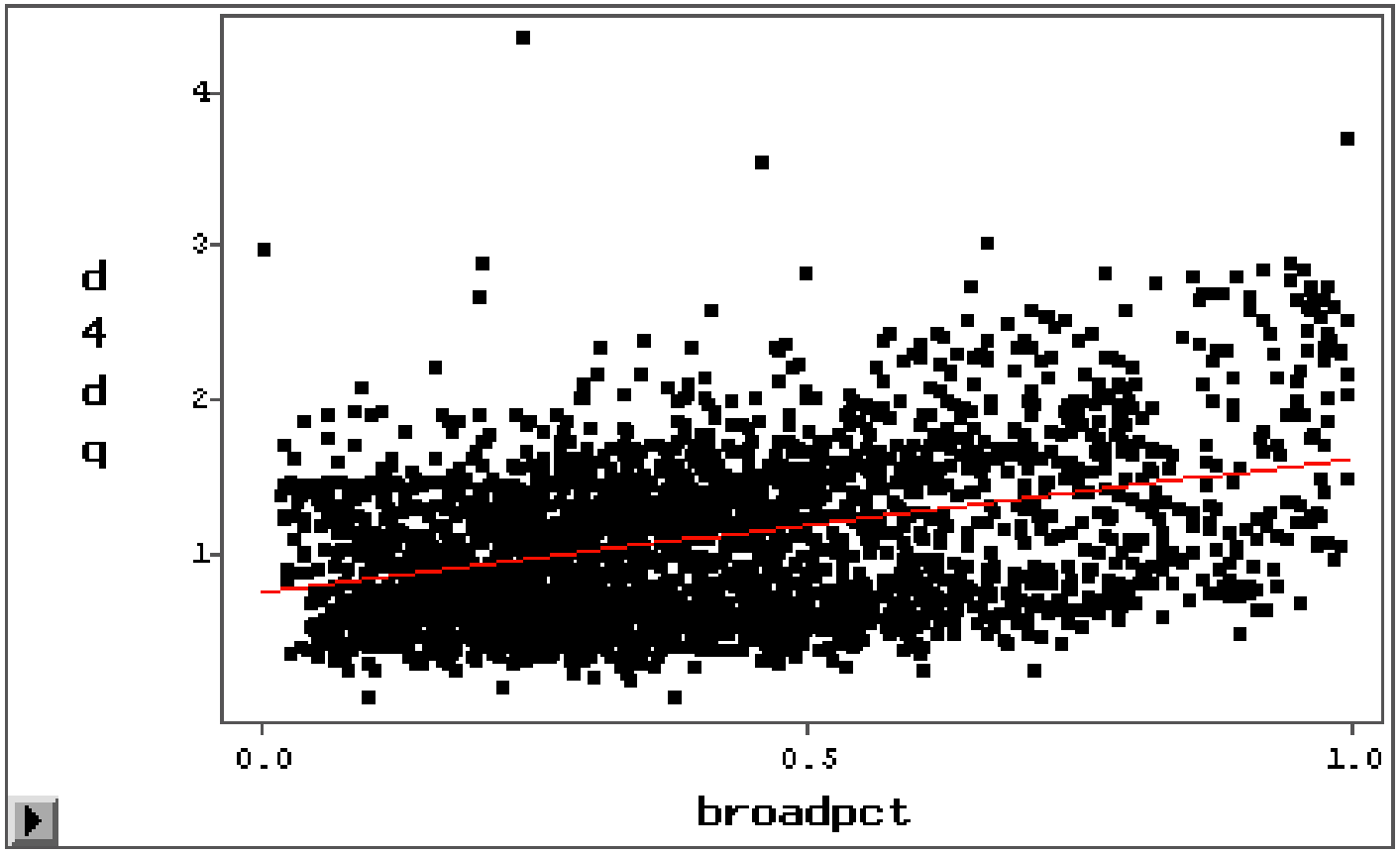
- Cross-country panel data with micro-aggregated indicators
  - Structural estimation on c,i,t,+A(j), instead of micro-estimates, but allows cross-country policy variables.
    - eg: innovation profiles and productivity (van Leeuwen)
    - Forecasting productivity (Bartelsman and Wolf)
- Heterogeneous firm model + calibration or ind. inf.
  - Bartelsman, Haltiwanger, Scarpetta;
  - Bartelsman, Gautier, de Wind
- Other Methodological choices: depend on question.
  - Does method of firm-level TFP estimate matter?
  - TFPQ vs TFPR may matter, but allowing estimated markup to vary, e.g. between entrants/incumbents may be sufficient

Technology Choice and EPL





ICT and variability of outcomes



Source: Eurostat ICT-Impacts Project

Technology Choice and EPL

- Search model with choice of opening job in safe of risky sector
  - In risky sector, technology shocks arrive, but exit option improves ex-post average return
  - EPL makes exit more costly
- Model is calibrated with moments from US micro and micro-aggregated datasets
- Country/Industry panel data, augmented with micro-aggregate indicators (sectoral riskiness) is used to estimate effect of EPL
- EPL is seen to reduce employment share in risky sectors (and reduce aggregate TFP growth)

Empirical specification

- Main regression: TFP effect of exit costs

$$V_{c,i,t} = \alpha + \sum_{x \in lkk^{IT}} \beta_x X_{c,i,t} + I_{c,t}(\gamma_0 + \gamma_1 F)_i + \sum \delta_j D_j + \varepsilon_{c,i,t}$$

where $I_{c,t} = EPL_{c,t}$ or CDB_c

- Frontier indicators (by industry for US or UK):
  - Top quartile productivity relative to mean
  - Standard deviation of productivity
  - Adoption of Broadband

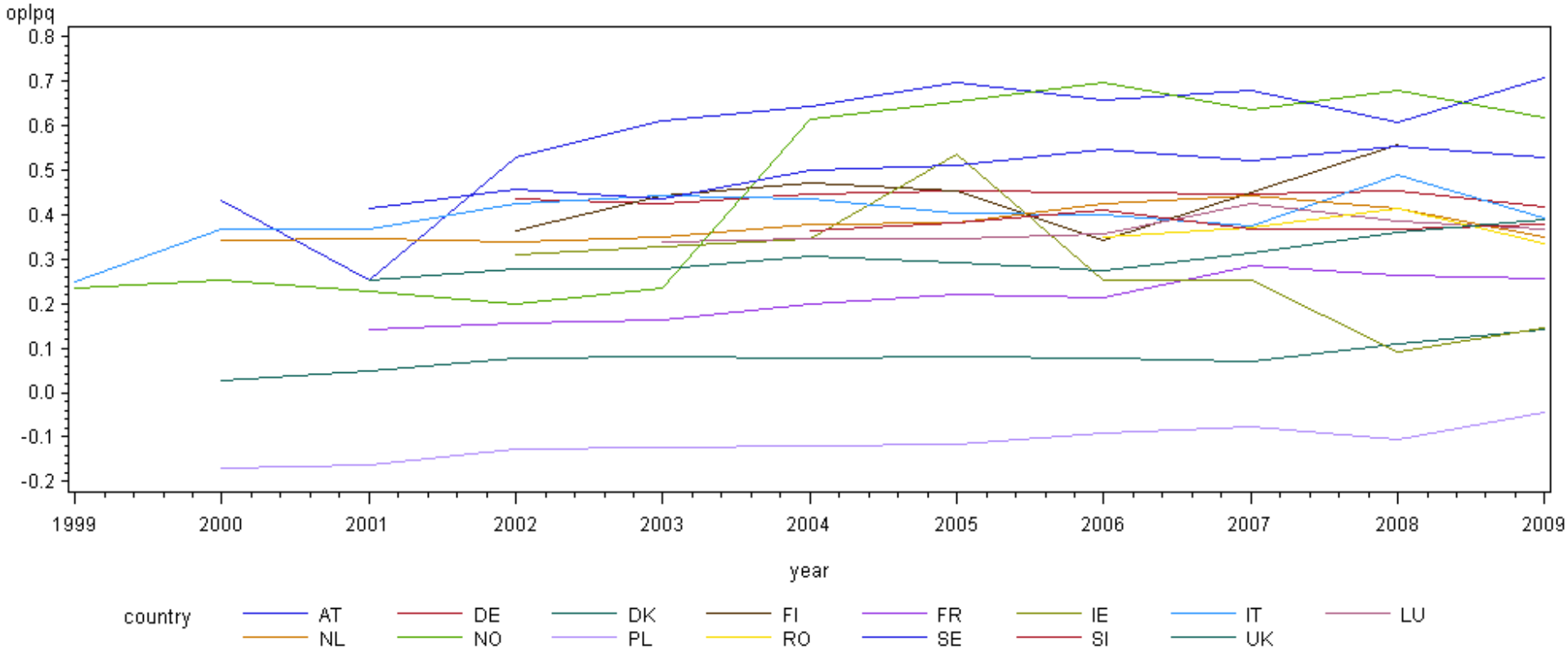
Exit costs and productivity

Dependent var:	Log(VA)	Log(VA)	Log(VA)
Regressor:			
Log: Kit,Knit,Hours	***	***	***
EPL	.47	.34	.46
	(0.02)	(0.14)	(0.19)
EPL x Rank	---	**-1.18**	**-1.13**
		(3.07)	**(3.08)**
Rank variable	---	Top quartile prod. relative to mean	Broadband-use
Num. obs.	7032	6790	7031
R-sq	.97	.97	.97

Exit costs and employment

Dependent var:	Labor share in sector	Labor share in sector
Regressor:		
EPL	.02	.02
	(0.74)	(0.74)
EPL x Rank	**-0.82**	**-0.84**
	(10.30)	**(10.55)**
Rank variable	Top quartile prod/mean	Broadband-use
Num. obs.	5518	5518
R-sq	.84	.84

BHS: Cov(LPR,Size)



Source: Eurostat ICT-Impacts Project, preliminary, do not cite.

Resilience

- Assess how different types of firms respond to different shocks
  - ICT intensity, high human capital, export intensive, (external) capital intensive, small, young
  - Difficulty in find historical data for different shocks….
- Preliminary work: ICT intensive firms have higher output variance, but employment relatively less variable
  - Possibly hoarding of high human capital workers

Conclusions

- Investment in meta-data and national micro-data infrastructure is relatively heavy
- Marginal cost of ‘new’ data requests are very low
- Micro-aggregated data allow for identification of interesting policy effects, especially when used together with other sources (e.g. EUKLEMS)
- Single country micro-studies still needed