

Horizontal Interventions for Manufacturing

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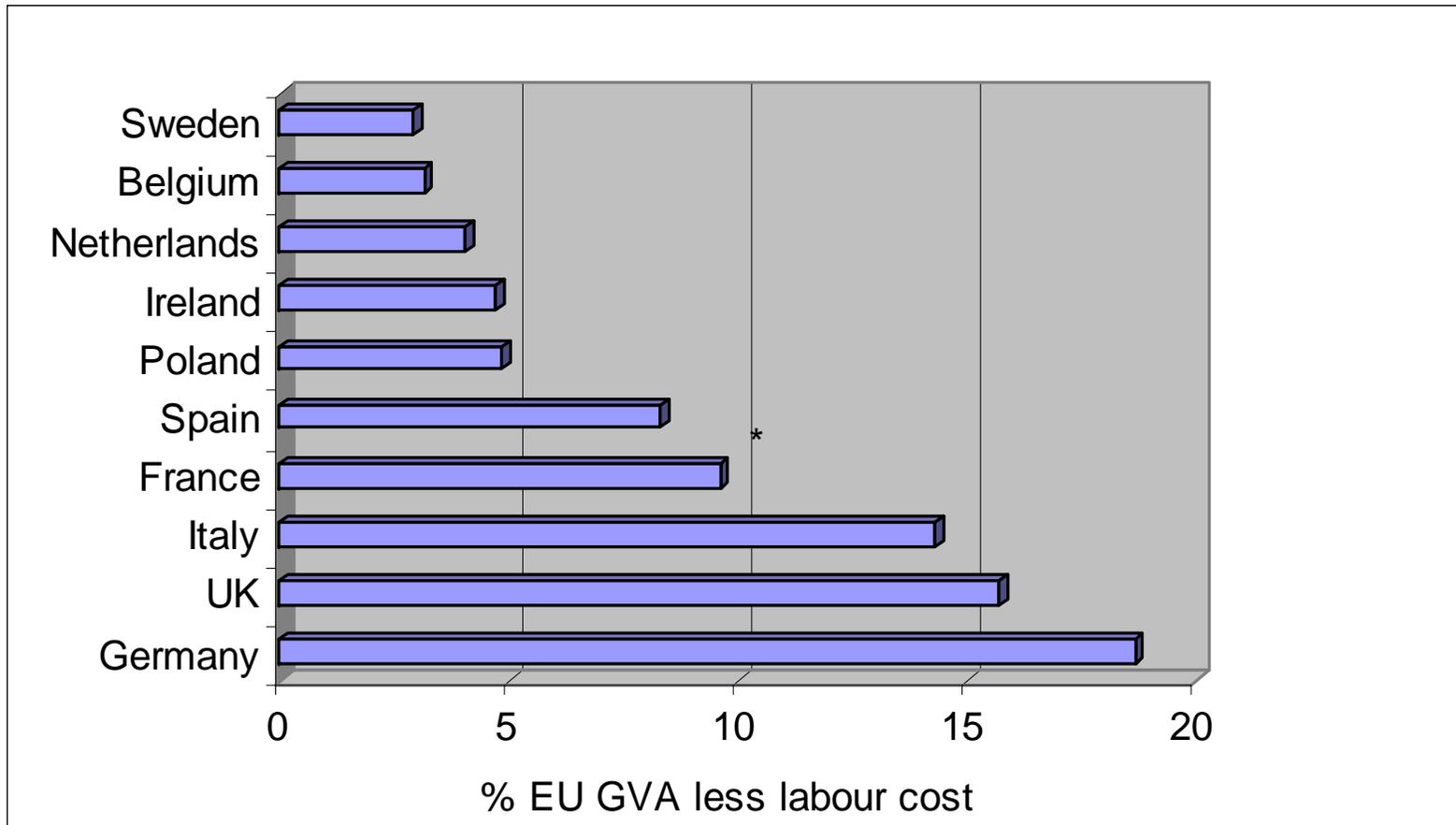
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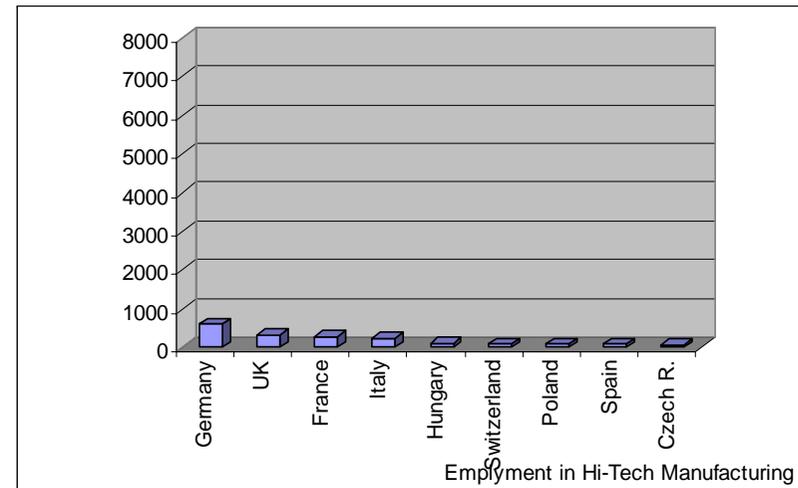
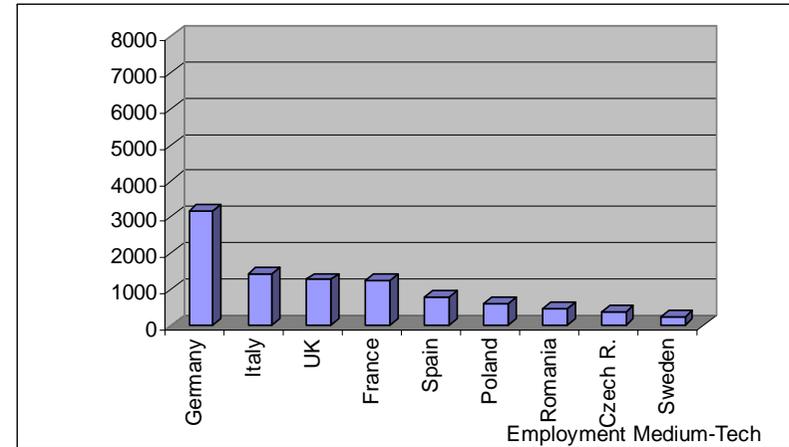
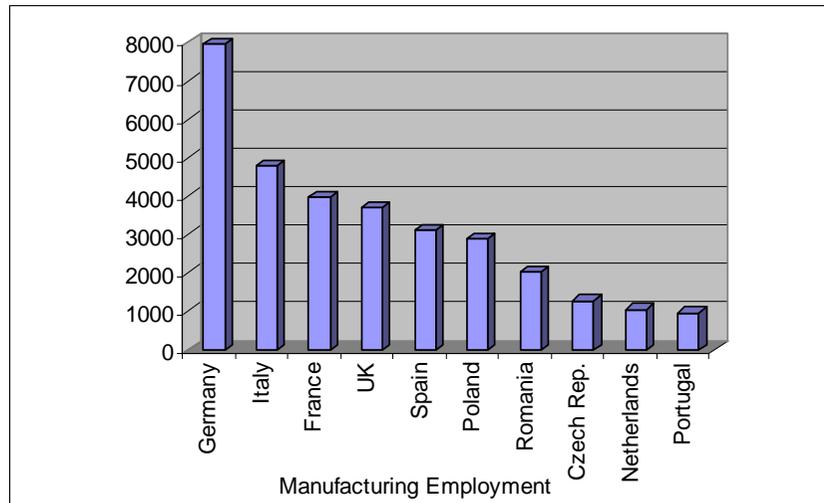
Process and Context

- The Macroscopic Perspective
- Regional Diversity
- Innovation System
- Recommendations for Interventions

Where is the value add?



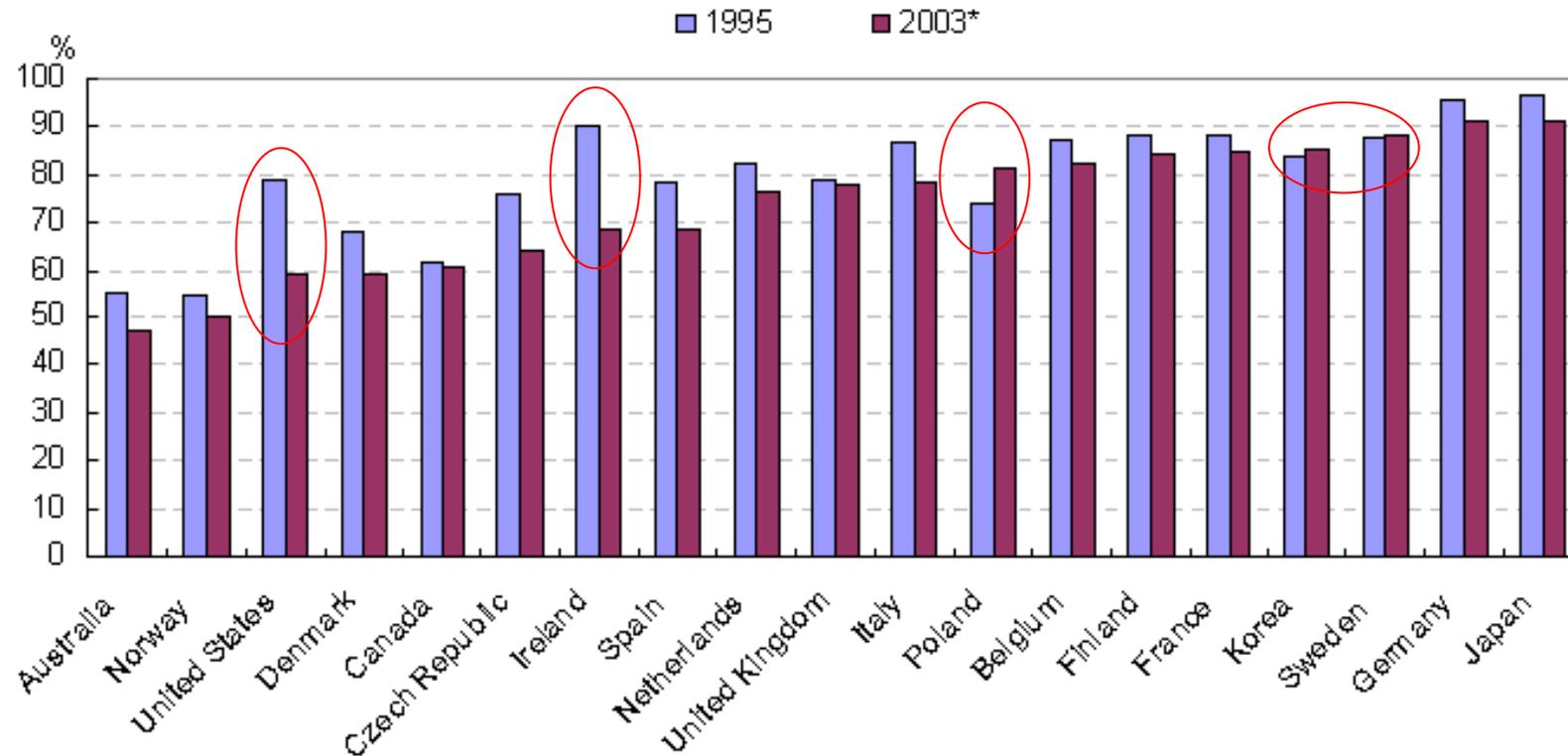
Where are the jobs (000's)?



Average (annual) personnel costs for manufacturing

- >40keuro: Belgium, Denmark, Germany, Luxembourg, Netherlands, Austria, Sweden
- 30-40keuro: France (39.9), Ireland, Italy (30.8), Finland (39.7), UK
- 20-30keuro: Spain
- 10-20keuro: Cyprus, Malta, Portugal, Slovenia
- <10keuro: Czech R, Estonia, Latvia, Lithuania. Hungary, Poland, Slovakia

Figure 26. **Share of manufacturing in total business R&D, 1995 and 2003*, in %**

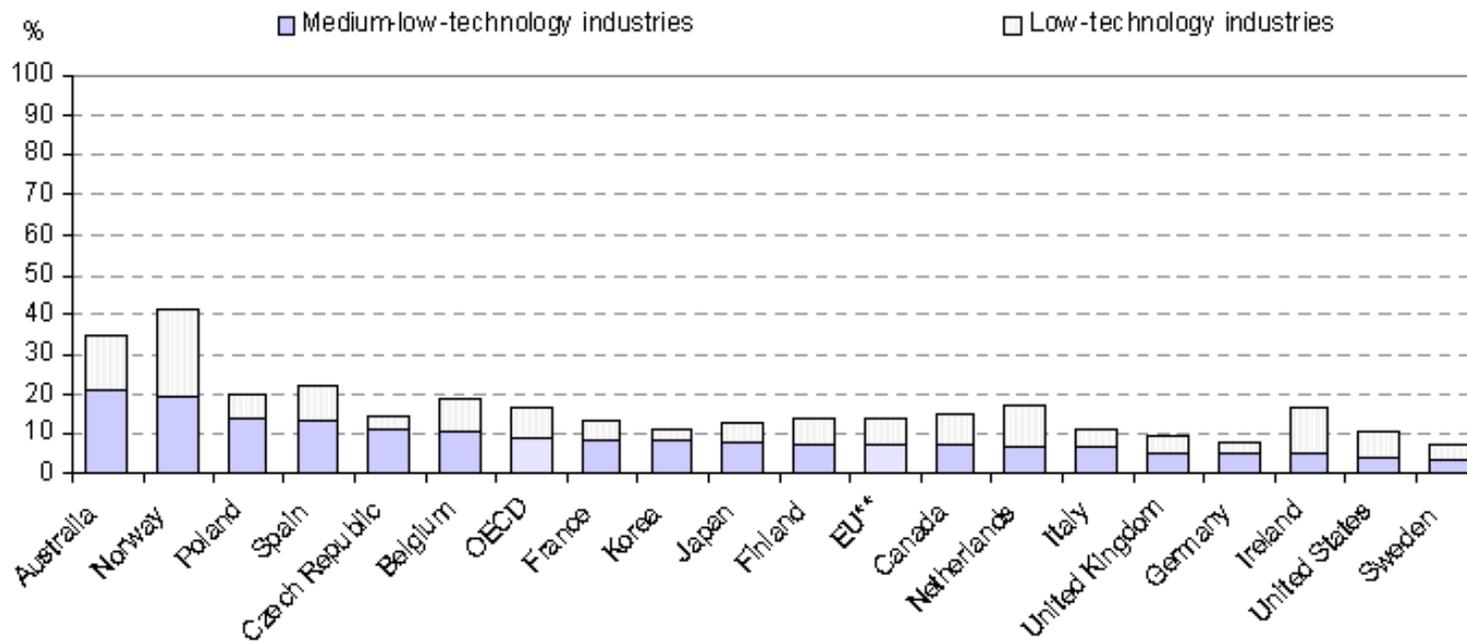
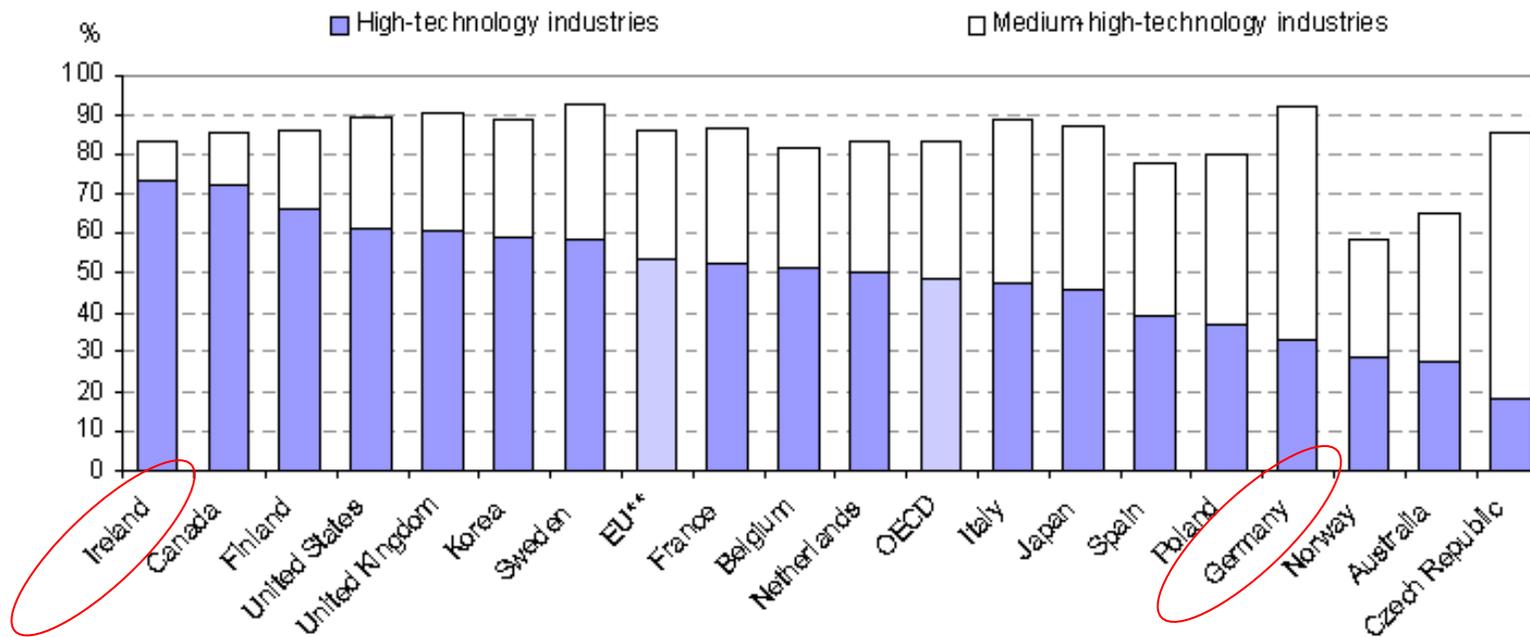


Note: * Or latest available year.

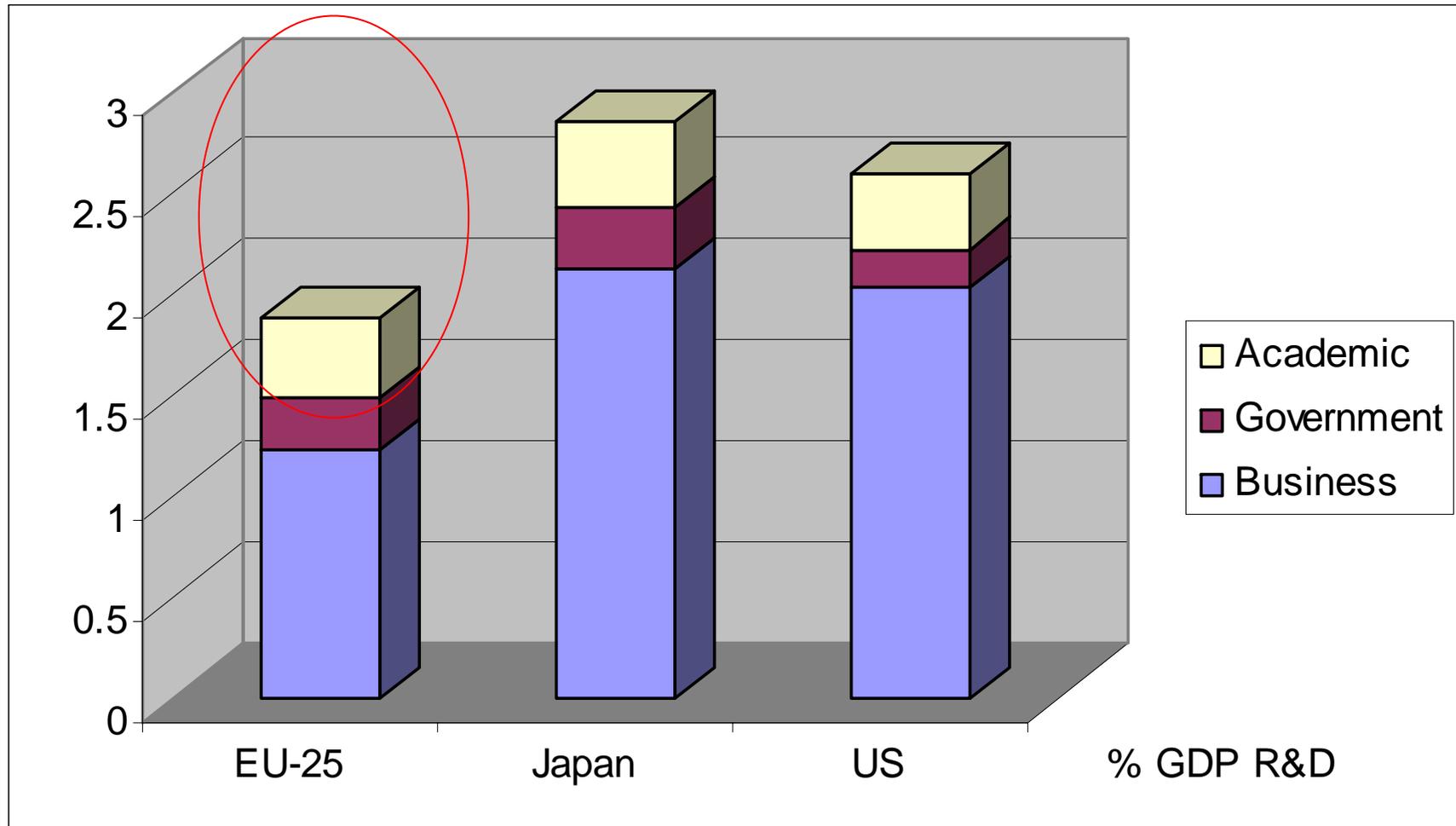
Sources: OECD, ANBERD and STAN Indicators databases, December 2005.

This slide is very important!

Figure 27. **Share of technology industries R&D in % of total manufacturing R&D, 2003** *



Who's doing the R&D?



This slide is also very important!

(Overall) R&D% by country

	Business	Government	Education
Germany	1.75	0.33	0.41
Italy	0.56	0.17	0.33 (2000)
France	1.36	0.36	0.41
UK	1.16	0.18	0.39
Spain	0.58	0.17	0.32
Poland	0.17	0.23	0.19
Romania	0.22	0.14	0.04
Czech R.	0.81	0.27	0.19
Netherlands	1.02	0.25	0.50
Portugal	0.17	0.23	0.19
Sweden	2.75	0.12	0.86
Ireland	0.77	0.90	0.33
Belgium	1.32	0.15	0.43
Hungary	0.37	0.26	0.22

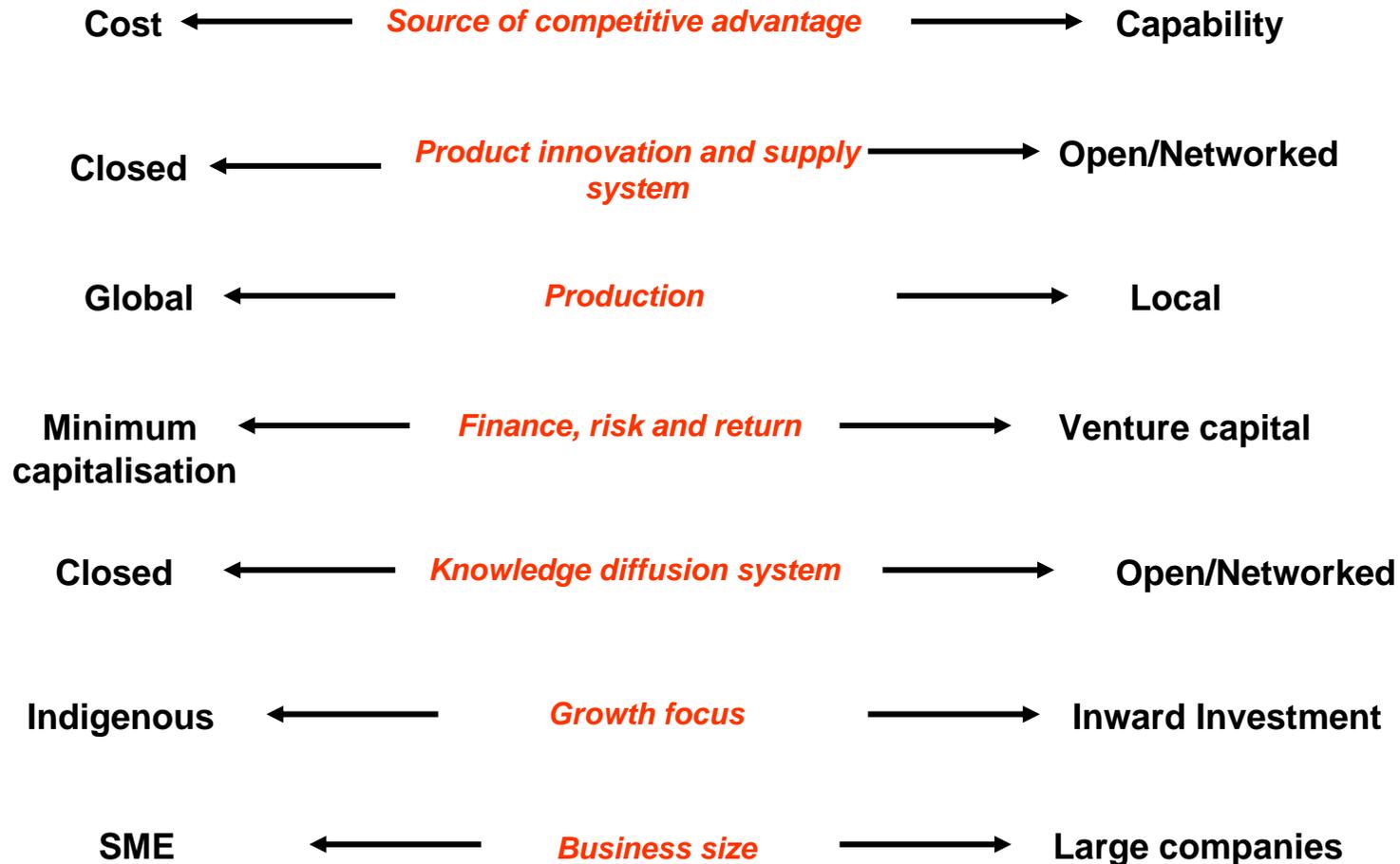
Macro-perspective: Opportunities

- Market failure in level of manufacturing R&D ($\%GDP \times \%Manf$)
- Country to country differences
- Factor cost differences
- Business engagement in R&D
 - Tax incentives to embed R&D and innovation
 - FP7 agenda
 - Strategy should be to embed R&D and innovation
 - Non competitive industrial tourism for mid-sized business
 - Economics standards across Europe for measurement of R&D
 - Set targets for market leaders and mid size companies
 - Econometric models of impact of R&D
 - Econometric models of location of R&D by multinationals
- Global and regional synergies
 - Convergence countries: Relationships for mutual economic growth
 - Outside Europe

Regional perspective: Constructed Competitiveness

- Sustained competitive advantage by increasing the intersection of the trajectory of business and regional strategy
- Consequences of diversity of regional change strategies
- Establishing hygiene v. transformational hard and soft interventions w.r.t. regional cluster maturity

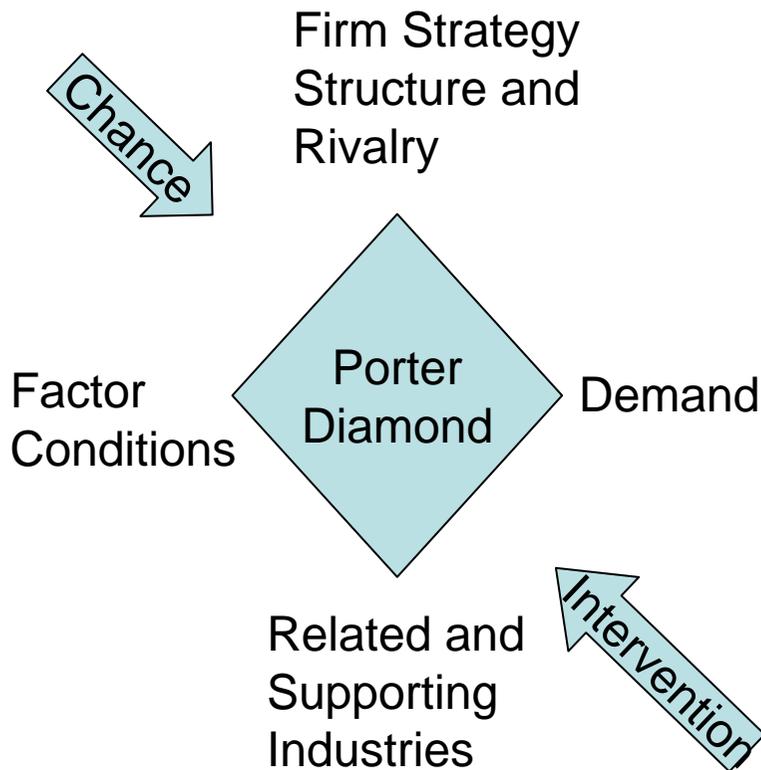
At least **seven** perspectives on competitiveness



Innovation System Process Improvement View



- Increase quality, relevance and impact of outputs
- Increase quality of inputs
- Increase capacity of process
- Increase effectiveness of process
- Increase capability of process



Actors:

Business

- Large, Mittelstand, SME, Start-ups
- Agile "glue" SMEs
- Service companies

Government

Finance

Academia

Institutes

Networks

Leadership

Systemic interventions

Finance

- Tax

Space

Information and networks

Competence centres
– concentrated capability

People

Linkages

Mapping diversity in regional strategies

(regions are really hybrids...)

Level of change	transformational	<ul style="list-style-type: none"> • Innovation • New science based industry • R&D based inward investment 	<ul style="list-style-type: none"> • First generation inward investments with social change
	incremental	<ul style="list-style-type: none"> • Second generation inward investment in “old economy” regions 	<ul style="list-style-type: none"> • Long term (Best) capability retention in specialised regions • Product to service transition

maintenance

growth

Economic outcome: jobs x increase in added value

Deep craft skills (Best)

- “Successful regions, like successful firms, have core competences or distinctive capabilities that impart competitive advantage. Like all capabilities, the regional variant takes time and teamwork to develop, is not easily imitated, and cannot be purchased in the marketplace”
- “Such regional technology capabilities are intangible: they are embedded in the production processes and deep craft skills of a region; and they are manifest in distinctive industrial sectors or technology-based clusters, and product profiles. The underlying distinctive capabilities give a region ‘organizational’ location advantage. At the same time, distinctive capabilities and associated skills can be easily taken for granted by the participants.”

Prototypical interventions by strategy

- Increase the size and effectiveness of *Manufuture* districts with technology
- Increase effectiveness of knowledge diffusion mechanism
- People: Development of next generation Meister and Applied research leaders

Level of change	transformational	<ul style="list-style-type: none"> • Innovation and lead markets • Increase impact of “scarce” research capacity by collaboration to form virtual critical mass • Increase success and growth rate of new science based manufacturing businesses; translation focus 	<ul style="list-style-type: none"> • Understand “East-West” synergy arising from diversity • Establish requirements for capability retention and reinvention • New institutes modelled on best practice; Network institutes
	incremental	<ul style="list-style-type: none"> • you don’t really want to be here..... 	<ul style="list-style-type: none"> • Systemic “process” efficiency gains • Increase R&D and innovation capability, agility and integration with customer • Tax incentives to increase capacity • Managing consequences of increased capitalisation

maintenance

growth

Economic outcome: jobs x increase in added value

TEU Hypothesis

- TEU's are agile smaller businesses/business led organisations (perhaps even individuals) that are able to work (by acting as “glue”) with less agile larger businesses or networks of businesses and allow the larger businesses to respond to a market opportunity that would be out of reach without working with the smaller ally.
- TEU implies that the small business will more rapidly transform – change/reconfigure itself in a timely way– to respond to the current business opportunity.

Value Propositions for TEU's

- Business led
 - Prospecting for Mergers and Acquisition targets for others
 - Integrating the IP of others to generate a more significant value proposition (Small VCs)
- Market led
 - Identifying customers outside the current customers of the company
- IP led
 - Acting as gateways for IP
 - Generating IP for others
- Integration led
 - Acting as hardware and/or software systems integrators – machine makers
 - Acting as project managers or consortium builders for either grant funding (usual) or to leverage commercial funding.
- Manufacturing led
 - Transform manufacturing business to higher added value niche – especially fashion industries.
- Supply led
 - Acting as gateways to specialist suppliers or a supplier network
 - Constructing prototypes or specialist prototype components for others

Questionable value

- Alliances of suppliers
- Grant Junkies

People in TEU's

- Individuals or alliances of individuals who;
 - are innovation focussed
 - have deep experience of a particular market niche
 - are extremely well networked, with multiple networks and trusted within each network
 - have a primary relationship with one “TEU” and act as “Associates” to others.
 - have gained their experience within a larger business that has perhaps downsized, (they may have been sheltered in the larger business before this) and
 - have made some “life style” choices about their way of working seeking for instance increased personal independence.
- Many of the individuals seem iconoclastic engineer entrepreneurs.

TEU Interventions?

- Many TEU's are market facing (formerly non-core) capabilities that emerge from large businesses. Where capable of high added value or jobs growth they should assisted by:
 - Infrastructure/start up support
 - European or National *meta-branding*
 - Networking to increase market opportunity, lead and skill sharing
- Some TEU's are focussed on developing new business activity, these should be encouraged by
 - Additional venture capital funds
 - Networking to increase market opportunity, lead and skill sharing

Summary (1)

- **R&D style**
 - Maintain dynamic capabilities in R&D across the R&D continuum but increase emphasis on translation – innovation, adoption and diffusion
 - More open innovation systems
 - Deep enabling engineering technologies
- **Business engagement in R&D**
 - Structural market failure to invest when compared to leading edge competitors
 - Tax concessions required especially to reward embedded capacity increases and to release critical capacity in SMEs
 - FP7 strategy should be to embed R&D and innovation not just to execute projects
 - Econometric models should be generated that show value of R&D and consequently set targets for market leaders and mid size companies
- **Manufacturing R&D capacity and capability**
 - Importance of competence centres due to business focus on product R&D, there should be more cross competence centre learning
 - Competence centres and other R&D suppliers should increase agility and integration with customer, and adopt translation focus
 - Collaborations should be encouraged to achieve virtual critical mass of emerging “scarce” research capacity

Summary (2)

- People
 - Development of next generation Meister and Applied research leaders focussed on the requirements of the evolution of current industries and the emerging industries
 - Development of leaders capable of entrepreneurship in networks
- Specialised regions
 - Recognise and grow competences represented by hard to replicate deep craft skills, ensure that depth of skills is maintained and evolved towards new business and industry opportunities
 - Increase the size and effectiveness of Manufuture districts with hard technology, standards and complementary soft interventions
- Convergence countries:
 - Relationships for mutual economic growth building on factor diversity
- Agile market and business growth facing TEU's
 - Infrastructure/start up support for TEUs to assist in retention of capability of value
 - Networking to increase market opportunity, lead and skill sharing
 - Additional venture capital funds to promote business growth and integration

Some other stuff...

Sources of Statistics

- The Changing Face of Manufacturing in OECD Economies, STI Working Paper 2006/9, Dirk Pilat, Agnes Cimper, Karsten Olsen and Colin Webb
- Europe in Figures, Eurostat Yearbook, 2006-7, 20 Feb 2007, KS-CD-06-001-ENC
 - Chapter 8. Industry and Services
 - Chapter 9. Science and Technology
- Employment and Earnings in High Tech Sectors, Bernard Felix, Statistics in Focus, Science and Technology, 32/2007 KS-SF-07-032-EN-N.
- (SME's and entrepreneurship in the EU, Manfred Schmiemann, Statistics in Focus: Industry, Trade and Services, Eurostat, 24/2006, KS-NP-06-024-EN-N)

“High Tech” manufacturing

- Computers, communications equipment and medical equipment (1.1% total EU employment)

Acknowledgements

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