Industrial and Technology Restructuring in CEECs: Key insights and policy issues

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Outline

- Past and future drivers of growth
- Key challenges of technology upgrading in CEE
- Policy lessons

CEE post-2008: In search of new sources of growth

- From *finance-dependent and debt-intensive growth* based on externally financed consumption (consumer durables) (in most of the CEECs) towards growth driven by investments and improvements in productivity
- Industrial upgrading and innovation driven growth as a new policy concern (cf. smart specialization)
- A move away from exclusive focus on structural reforms .... call for technology upgrading perspective

THE IMPORTANCE OF STRUCTURAL DIFFERENCES BETWEEN LOW, MIDDLE AND HIGH INCOME EU COUNTRIES (CF. NEW STRUCTURAL ECONOMICS)

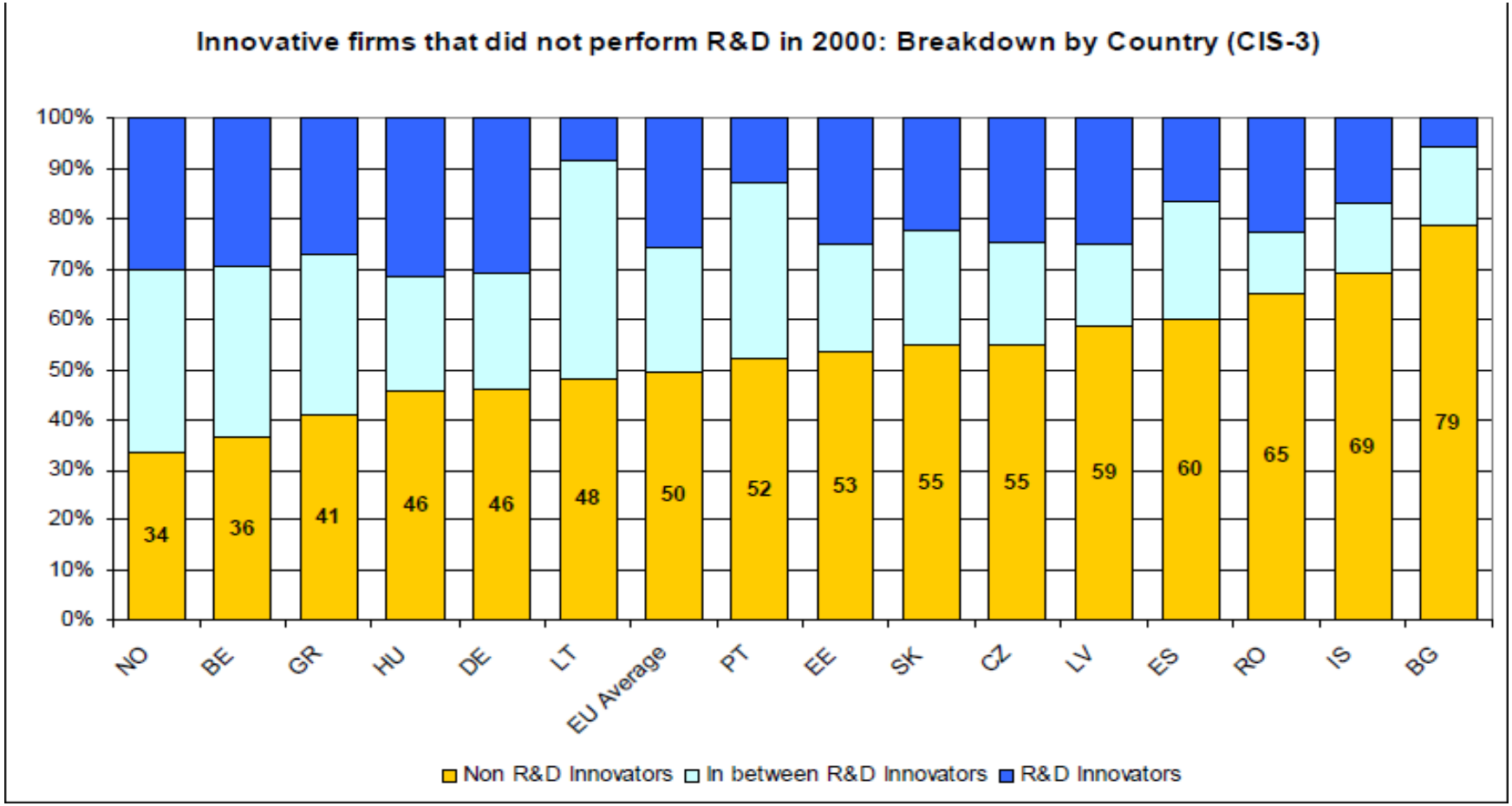
ARE CURRENT INNOVATION POLICIES FIT FOR PURPOSE I.E ARE THEY DIFFERENTIATING BETWEEN COUNTRIES OR ARE THEY DOMINATED BY 'THE BEST PRACTICE POLICIES'?

ARE EE COUNTRIES' INNOVATION POLICIES CONDUCIVE TO THEIR INDUSTRIAL AND TECHNOLOGY UPGRADING?

Different sources of productivity improvements in CEECs

- A growth driven by TFP but what is behind figures?
- Diversity of the EU27 in terms of driving factors of growth (WEF 2008 GCR)
  - Efficiency driven (BG/RO); in transition (other NMS), Innovation driven (SI, EE and EU15)
- The sources of productivity improvements in FDI in CEE: Production capability (quality assistance/ISO9000), not technological capability (Majcen. Radosevic and Rojec et al, 2009; Kravtsova and Radosevic, 2011)
- The end of transition rents period (Berglof, 2014)

In CEE... non-R&D innovators dominate



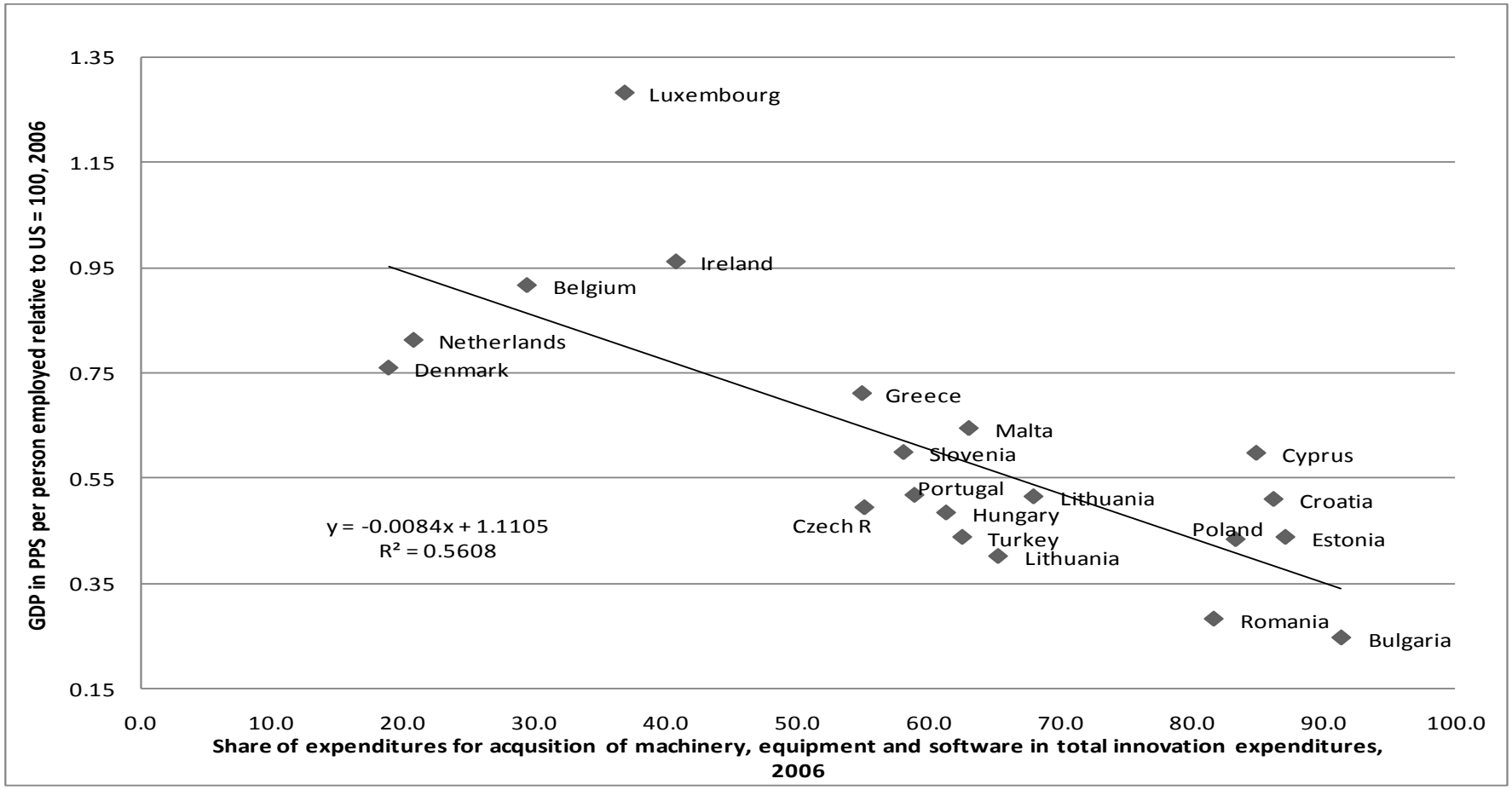
Source: Arundel, A., C. Bordoy and M. Kanerva (2008), 'Neglected innovators: how do innovative firms that do not perform R&D innovate? Results of an analysis of the Innobarometer 2007 survey No. 215', INNO-Metrics Thematic Paper

Turnover from innovation as percentage of total turnover

	2004	2006
EU 10 New	12.5	12.4
EU15 Old	12.5	13.5

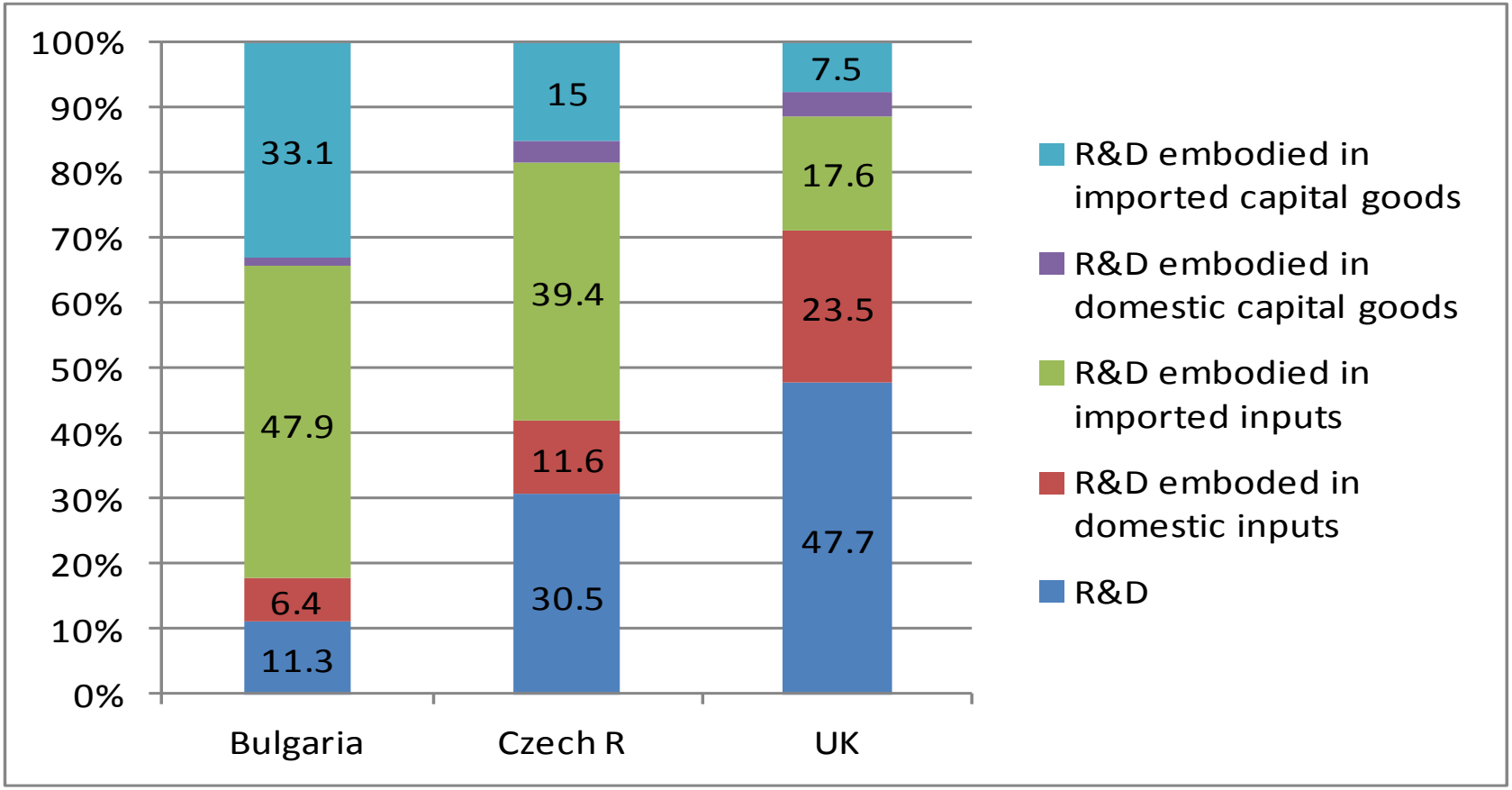
- Similar innovation dynamics but ... within different mode of innovation

Relationship between embodied investments and labour productivity in European countries … Innovation at behind the frontier is about acquisition and effective adoption of machinery



R&D embodied in imported inputs and capital goods dominates in total R&D

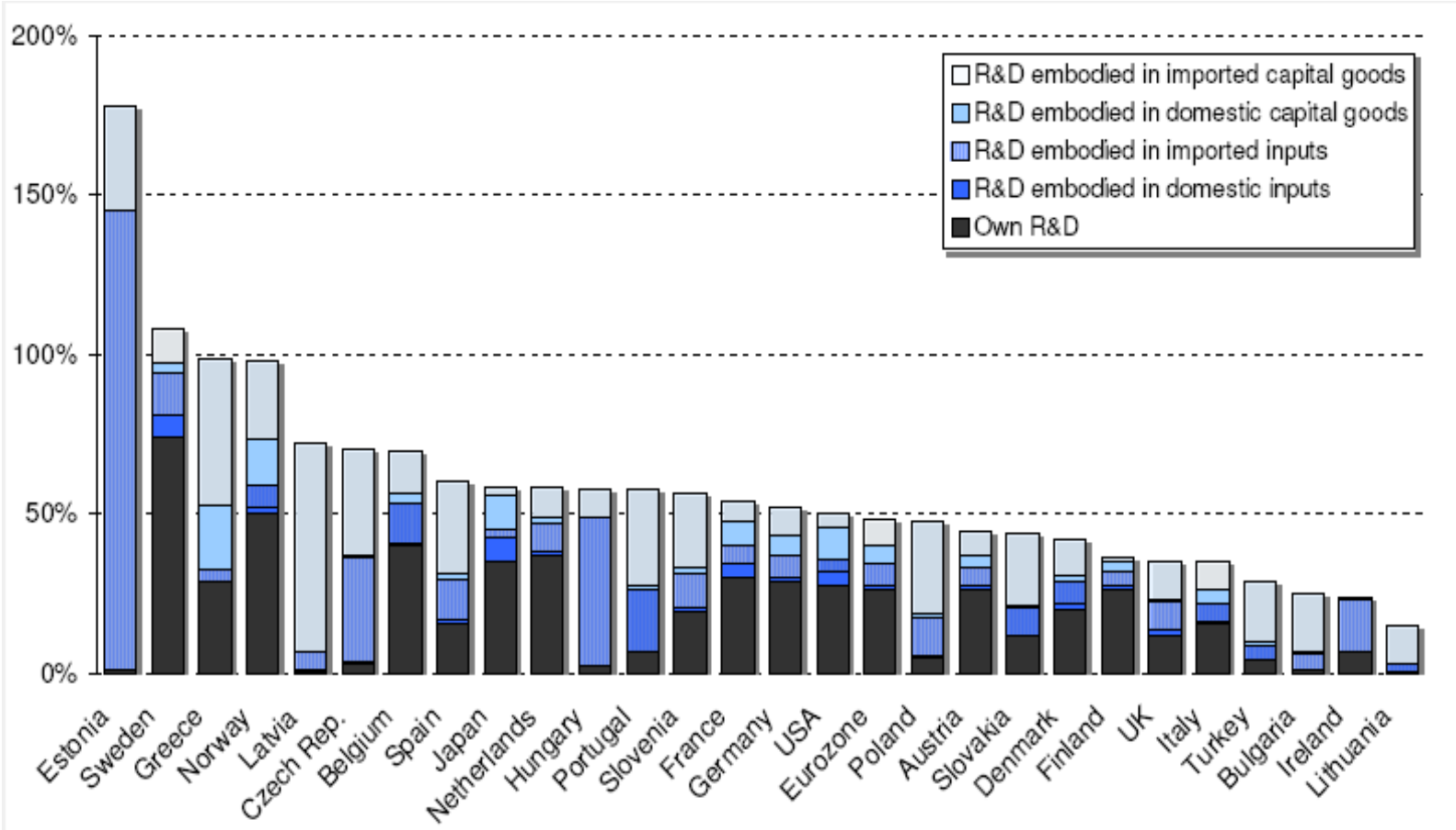
Share in total R&D content of R&D and R&D Embodied in inputs and capital goods in Bulgaria (2001), UK (2000) and Czech Republic (2000)



Source: Recalculated based on Knell, M. (2008)

An indirect R&D content (R&D in imported inputs and capital goods) dominates in the EU 10 CEE:

% share of total R&D content in the manufact. of ICT equipment



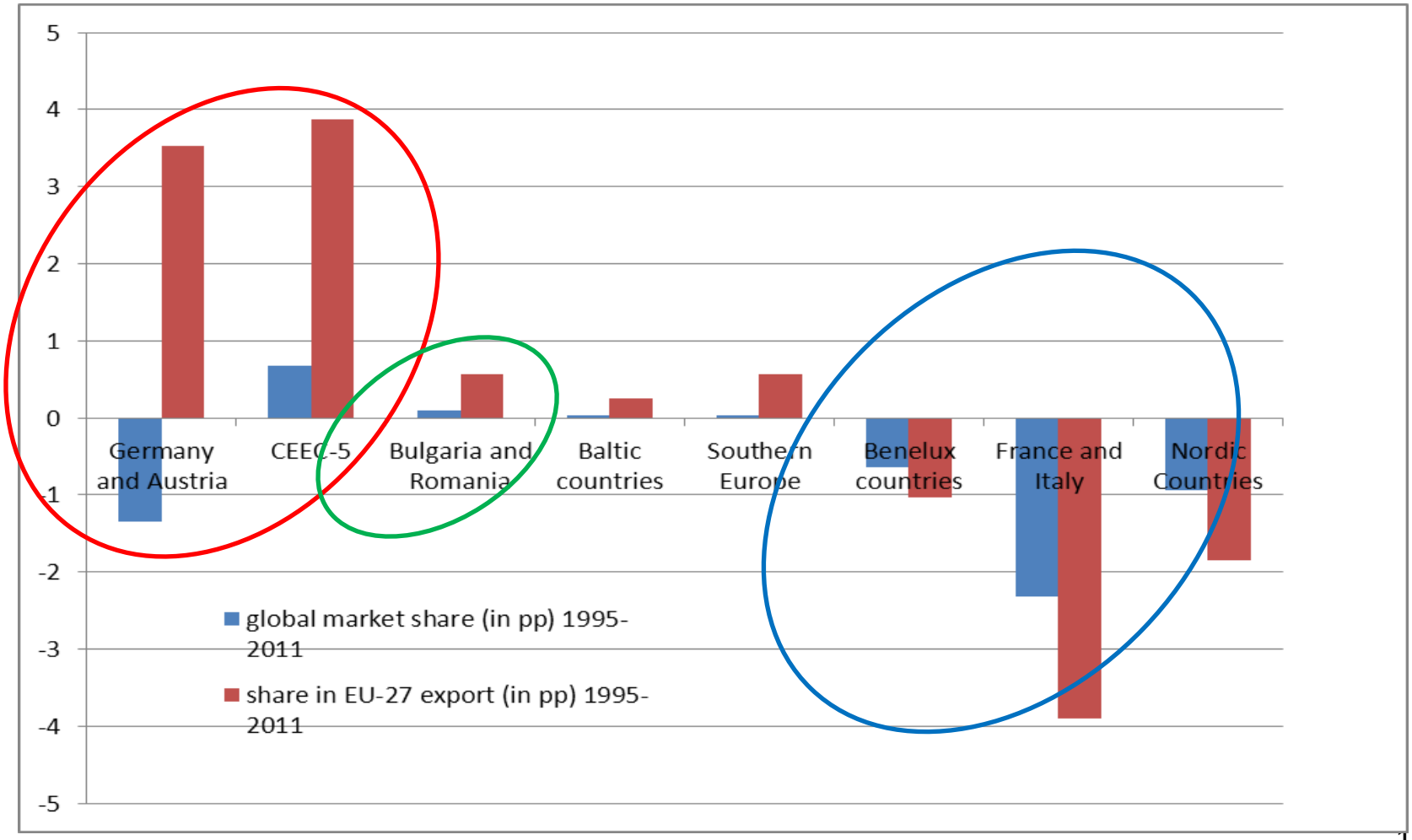
Source: Knell M. (2008), Embodied technology diffusion and intersectoral linkages in Europe. Europe Innova Sectoral Innovation Watch deliverable WP4. European Commission, Brussels.

Implicit technology effort dominates in CEECs - IPR are not suitable mechanism to protect technical knowledge when operating behind the frontier

Protection methods used by enterprises as a percentage of innovative enterprises by country .....

	Protection	Not protection
Hungary	**22.7**	**77.3**
Belgium	32.2	67.8
Portugal	33.7	66.3
Romania	**34.8**	**65.2**
Slovakia	**35.2**	**64.8**
Bulgaria	**36.8**	**63.1**
Czech Republic	**38.1**	**61.9**
Estonia	**38.5**	**61.5**
Italy	38.6	61.4
Poland	**40.2**	**59.8**
Greece	**42.3**	**57.7**
Netherlands	42.5	57.5
Lithuania	**44.5**	**55.5**
Spain	45.2	54.8
Finland	50	50
Luxembourg	51.5	48.5
Ireland	52	48
Denmark	63.9	36.1
Germany	65.2	34.8
France	83.8	16.2

CEECs as part of the newly established German industrial system. Other TE and WE regions are largely outside of GVCs or have not further 'globalized'



Source: Based on WIIW report 2013

Central Europe: flying geese' model of tandem growth

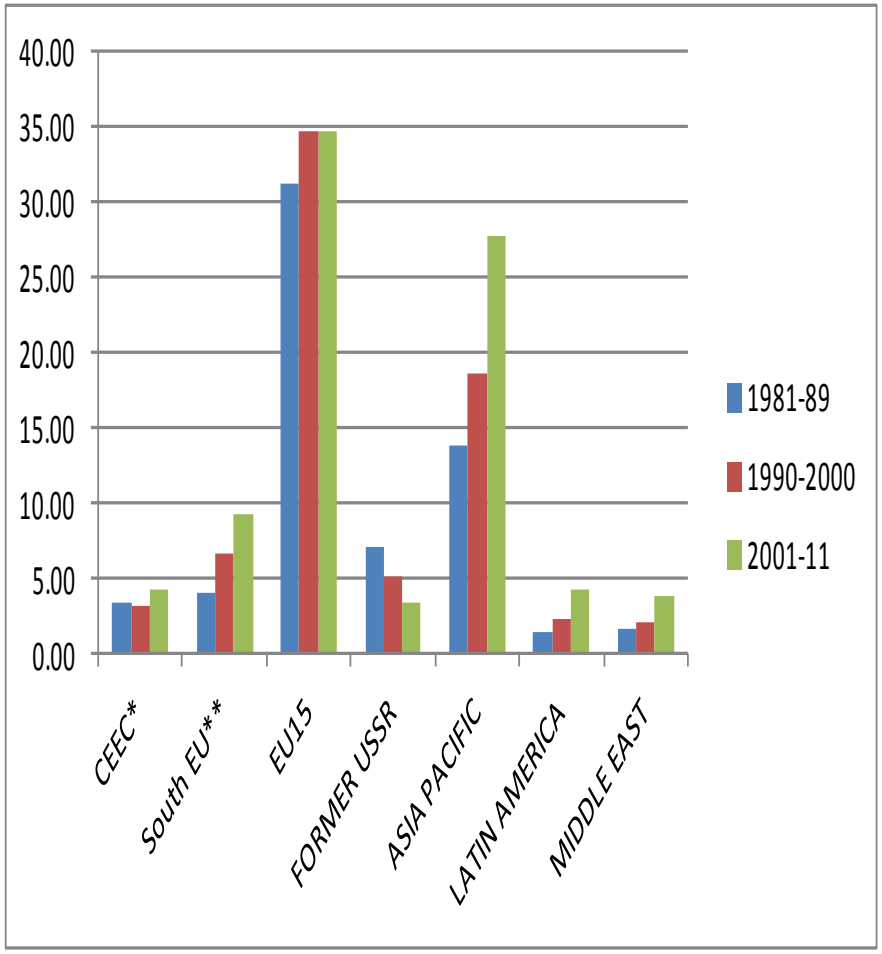
- Germany's MNCs relocations to CEE: boost to productivity improvements and decreased unit labour costs in Germany
- Productivity gains from offshoring to CEE > Germany and Austria experienced only minor job losses
- German offshoring to CEE boosted not only the productivity of its subsidiaries in CEE by almost threefold compared to local firms, but it also increased the productivity of the parent companies in Germany by more than 20% (estimates by Hansen 2010 and Marin 2010).
- A process of quality upgrading of CE but much less so in SEE and Baltics (Dulleck et al, WIIW, 2004)

R&D based growth in CEE ?

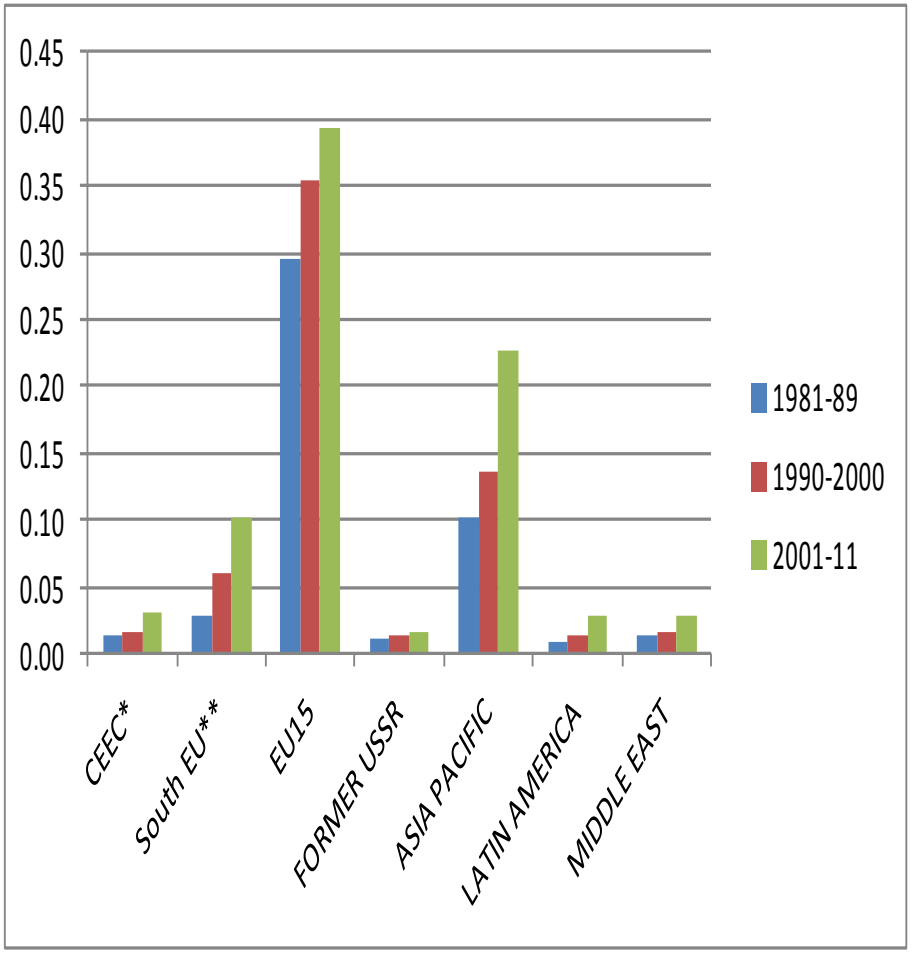
- Recovery of science systems (improved scientific excellence) but challenges of local relevance
- Not recovery of technology activities at least judged by patents but significantly improved production capabilities (for example, export unit values)
- Knowledge intensive enterprises emerging – specialized suppliers – that respond to local users' needs but limited local demand for RDI
- Value chain dependent KIEs and the missing large firms as 'pull drivers'

In favour of R&D based growth: CEE: recovery of science systems.....

% Papers in the world

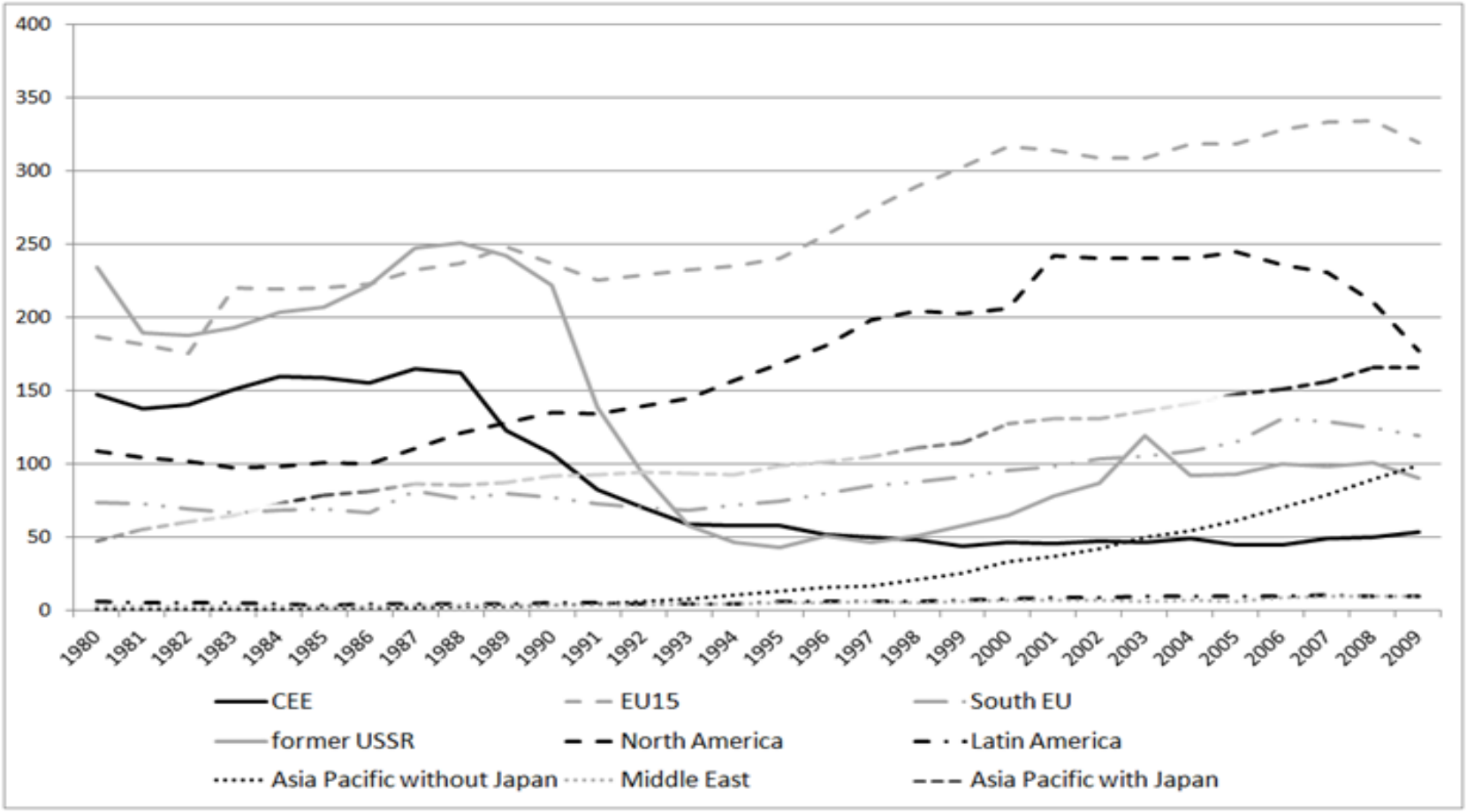


Share of world citations



... But without recovery of technology effort

Patent intensity 1980-2009 (priority patents per capita)



Source: Iciar Dominguez Lacasa, Alexander Giebler (2013) Technological activities in CEE countries: A Patent analysis for the period 1980-2009, IWH, Halle Institute for Economic Research, Mai 2013, GRINCOH deliverable

KBE in CEECs compared with the global model: a stylised picture based on case studies

	New technology based firm	CEE knowledge based firm
Mode of growth	Generic expansion	Productivity based expansion
Strategic objective	Commercializing results of IPR	Diversifying to exploit organisational capabilities
Model role	'Gazelle'	Knowledge broker/Specialized supplier
Structural feature	Trendsetter	Trend spotter
Market orientation	Global market	Domestic market
Key competitive advantage	New world frontier technology or product	Customer oriented organisational capabilities
Threshold barrier	IPO	From domestic brand builder and networker to established exporter

Source: Radosevic S. and R. Wooodward (2008) A comparative overview of case studies of knowledge based firms from Central and East European countries, mimeo

Factors discriminating between more and less successful innovators in CEE

- Understanding of user needs and user involvement
- Understanding of market

Less important

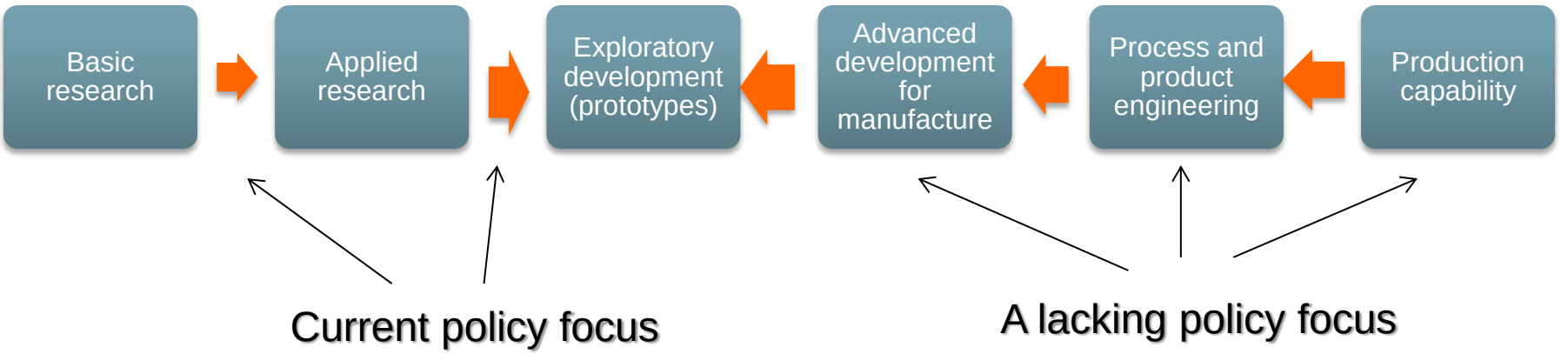
- Successful R&D collaborations
- Successful innovation collaborations

- Source: Slavo Radosevic and Esin Yoruk (2012) SAPPHO Revisited: Factors of Innovation Success in Knowledge-Intensive Enterprises in Central and Eastern Europe

Alternative policy models of technology upgrading

R&D based growth

Technology upgrading



FROM GROWTH BASED ON PRODUCTION CAPABILITY AND TRANSITION RENTS TO GROWTH BASED ON TECHNOLOGICAL CAPABILITY

Systems of innovation and growth in CEE: a summary

- A key weakness of innovation systems in EE: weak firm specific technology capabilities – a lack of large domestic R&D active firms
- Growth (so far) is based on production capability (i.e. on learning by doing and learning by interacting confined on value chain), not on technology capability
  - Cf. FDI: direct effects are the most important; positive vertical spillovers; weak or negative horizontal spillovers
- R&D: there is not general shift towards BES
- Global integration: CEEB > 'network trade' in low VA segment

The challenge for CEECs is how to couple its own R&D and innovative activity with absorption and adaptation of foreign knowledge ....

……Smart specialization is the only game in town

Value chains and export vs. innovation:
how to reconcile and integrate two policies?

- Internationalization and innovation policies should be integrated
- Currently:
  - FDI: marketing country for FDI
  - Innovation policy: exclusively R&D/high tech focus
- CEE: dangers of ‘surrogate modernisation’ (cf. long 19th century) + interaction with Structural Funds and with the EU core to enhance endogenous technological capability

Are current innovation policies in CEE appropriate to their income levels and distance to technological frontier?

Criteria for clustering policy mixes

1) Share of competitive R&D such as universities and public research organisations in the total funding;
2) Share of collaborative R&D programmes in the total funding;
3) Share of technology transfer mechanisms and spin-off support in the total funding;
4) Share of direct business R&D and business innovation support in the total funding;
5) Use of R&D tax incentives;
6) Support to venture capital funds.

Source: Kincsö Izsák, Paresa Markianidou and Slavo Radošević, Lessons from a Decade of Innovation Policy, *Journal of Common Market Studies*, forthcoming.

Clusters of EU27 policy mixes groups

Group	*Shorthand label and members*	*Brief description*
Group 1	**Science - competitive R&D focused** Ireland, Malta, **Poland, Slovenia**	Structural Funds-driven; Dual orientation on science and business R&D but with stronger focus on science (competitive R&D) orientation
Group 2	**Science - collaborative R&D focused** **Estonia**, Finland, Germany, Greece **Latvia,** Sweden, Switzerland	Science and collaborative R&D oriented policy
Group 3	**Commercialisation driven** France, Italy, Netherlands, United Kingdom	Orientation towards commercialisation of public R&D coupled with support to framework conditions (fiscal incentives)
Group 4	**Business R&D and innovation oriented** Austria, Belgium, **Czech Republic,** Denmark, **Hungary**, Norway, Portugal, Spain	Business R&D and innovation focused policy coupled with support to competitive R&D
Group 5	**Science and business R&D focused** **Bulgaria**, Cyprus, **Lithuania,** Luxembourg, **Romania, Slovakia**	Structural funds driven; Dual orientation on science and business R&D but with stronger focus on business R&D orientation

CEEC innovation policies reflect much more 'the best practice', not their specific technological positions and constraints

- The 'science – collaboration' policy mix model can be found in all four groups > it is the most common model followed by countries of very different technological levels.
- The unexpectedly high homogeneity of policy mixes despite the relatively big differences between countries in technological and economic development and the differences with respect to the role of knowledge generation vs. knowledge absorption in their growth.
- The exclusive focus on policy transfer and the diffusion of 'best practice' *de facto* precludes a critical understanding of the factors that influence a country's technology upgrading.

Innovation and transition period: Institutional capacity in the 1990s

- ‘Minimalist state’
- Transition agenda> clear blueprint of the best practice and targets
- Regulatory policies
- Privatization as implicit industrial policy not really used
- Innovation policy either non-existent or marginal
- Modernization of science policy

Europeanization of innovation policy: Institutional capacity in 2000s

- Building of generic innovation policy esp. after 2004
- Horizontal policies
- High-tech bias: commercialization of RD
- RTDI infrastructure (S&T parks, VC, TT offices)> (i)relevance?
- Technologically neutral
- 'Agencification' of innovation policy
- Extensive 'transational learning' > copying best practices (excessive homogeneity, JCMS 2014 forthcoming
- Passive internationalization

Institutional capacity for smart specialization: 2014>

- Public – private coordination mechanisms missing
- Mezzo level coordination mechanisms (sectors and value chains) vs. micro-focused agencies
- Vertical policies vs. horizontal mechanisms
- Sector and technology specific expertise vs. technology neutrality
- Tailor made policies vs. package of instruments
- 'Entrepreneurial discovery process' vs. public consultation of public sector stakeholders
- Institutional conditions for experimentation vs annual multi-year programming
- New metrics required vs. IUS

Lessons for new member states involved in Smart Specialization initiatives

1. Focus on the whole innovation chain including production capabilities
2. Explore how to use GVC as linkage, leverage and learning mechanism and integrate with SS activities
3. Create institutional context within which SSS can be effectively designed and implemented
4. Start from 3