

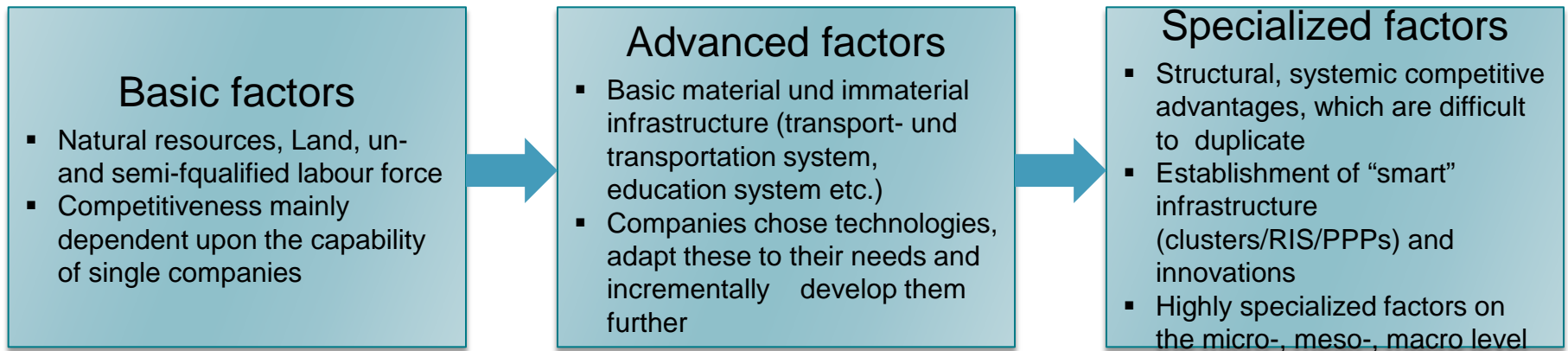
Building national innovation infrastructure in a systemic perspective: Structures and strategies in European countries

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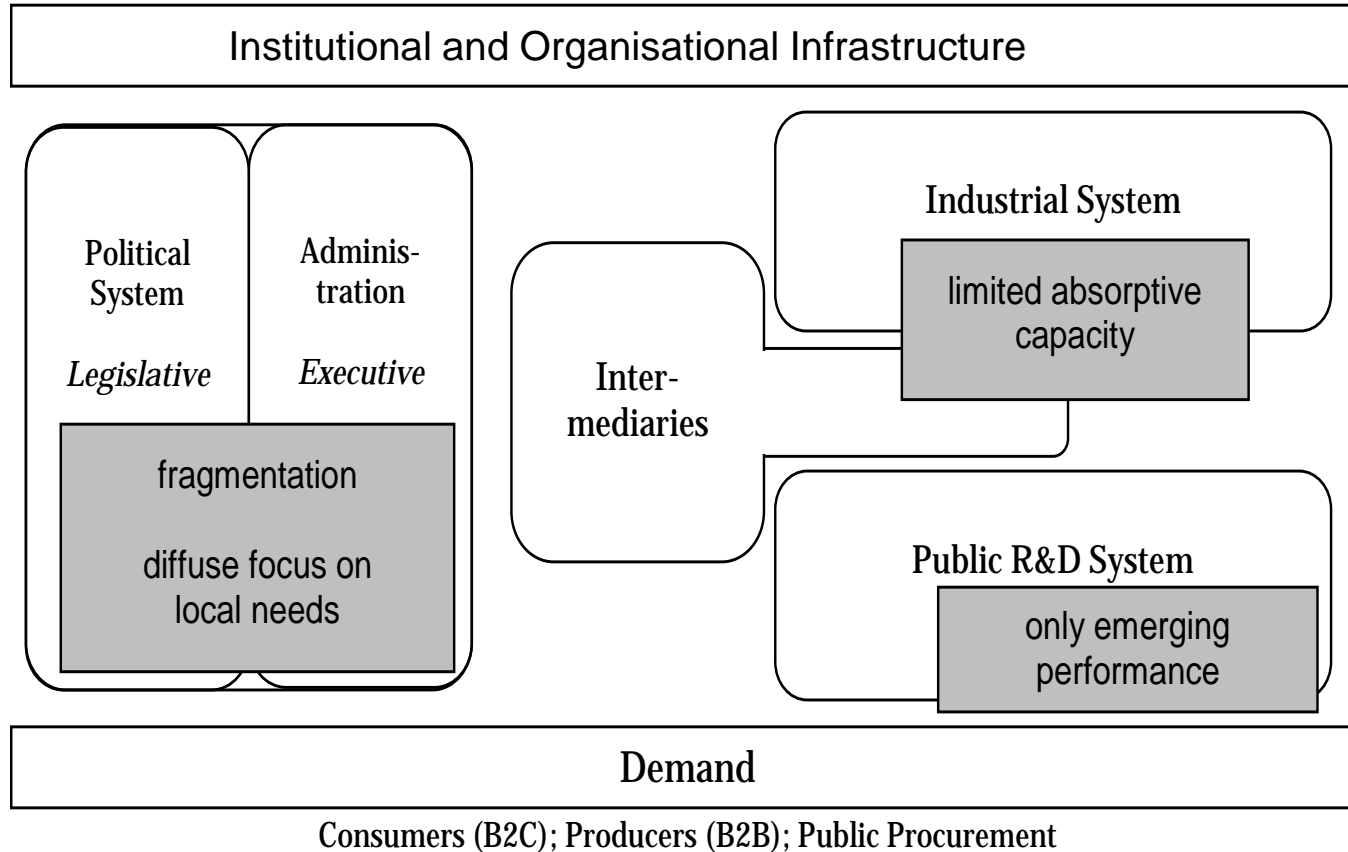
Steps on the path towards national/regional competitiveness



Source: on the basis of Messner 1995

Innovation infrastructure: Typical challenges

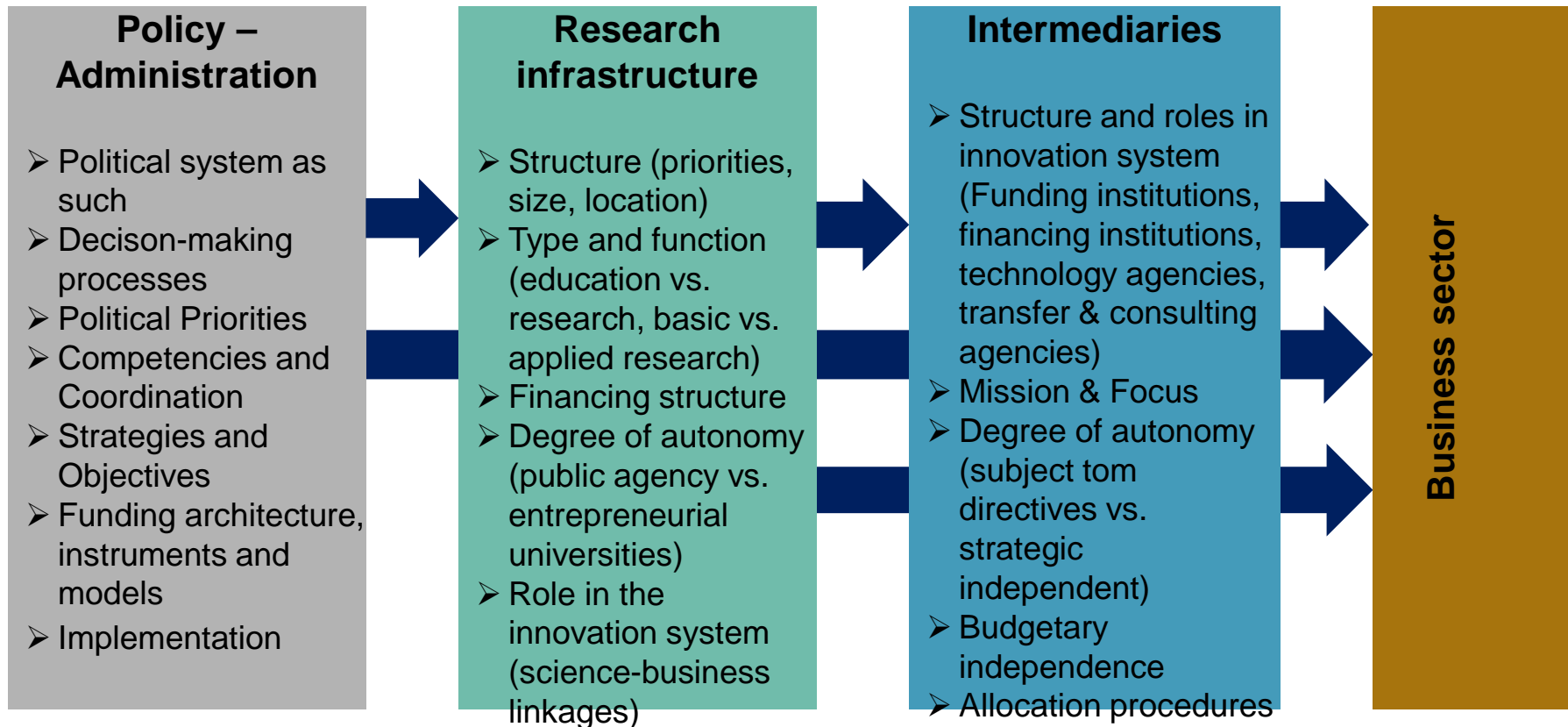
Banks, VC, IPR, Standards, Norms; Taxation, Labour Market, Unionisation, (Business) Culture



Source: own concept

Innovation infrastructure: System-forming elements

Main pillars regarding the building of innovation infrastructures:



Options of policy implementation: Extensive experience with long-lasting, large programs

„Bottom-Up“-Approach (USA):

Financial incentives related to the exploitation of inventions (to retain royalties) and competitive procedures

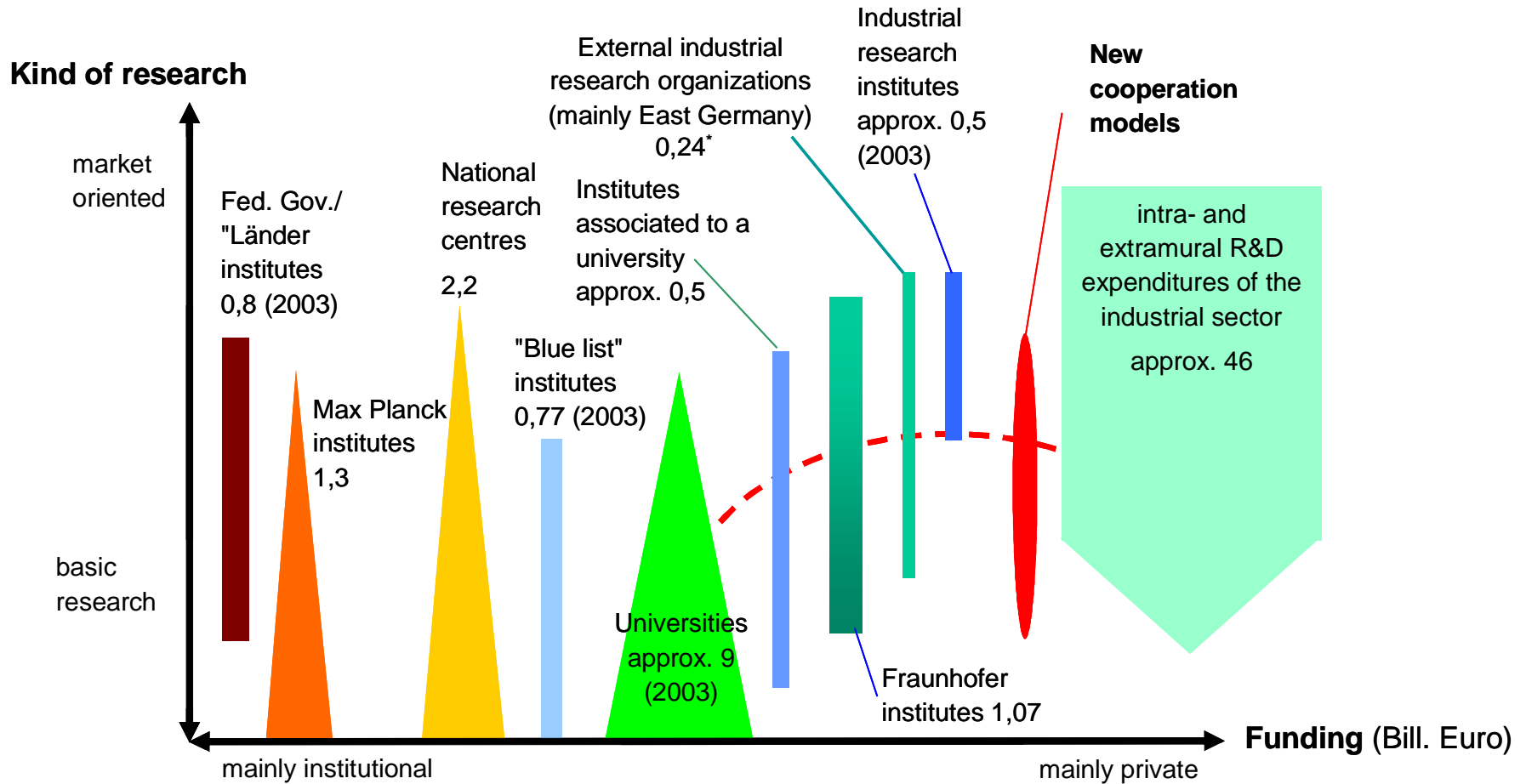
„Top-Down“-Approach (France):

Identification of national strategic technology- und innovation policy objectives; centralized policy design and governance; however, certain functions relating to RTDI increasingly shared with regional authorities

Mixture of Top-Down/Bottom-Up (Germany):






Incentives from the top, as well as delegation from responsibilities downward (project level, new models); creation of favourable framework conditions (corporative organisations with high autonomy)

Research infrastructure in Germany



Source: Koschatzky et al. (2008)

Structural characteristics of the R&D funding institutions compared

						
Broad institutions, general mission	MX	BR, VN		TH	DE, FI US, CN	Focused, specific mission
Subject to directives	VN, CN		MX, TH	BR	US, DE, FI	Strategic independent
Dependent on public budget	VN, CN	MX		BR, TH	US, DE, FI	Budgetary independent
Sparsely differentiated organization	VN	CN, DE	US, FI	BR, TH	MX	Organization with specialized departments
Broad, complex portfolio of instruments	MX, BR	VN	TH, CN, FI	US, DE		Specific, focused instruments
Changing portfolio	VN	CN, MX	BR	DE, US, TH	FI	Stable portfolio
Weak specifications of programs		MX, BR, TH, VN		CN	DE, US, FI	Distinct program specifications
No systematic allocation		MX	TH	CN, BR, VN	DE, US, FI	Criteria & expert based allocation

Source: own compilation

Innovation systems: Observations in European countries

Common features of the innovation leaders' innovation systems

- Innovation leaders perform best on all dimensions: from research and innovation to inputs, through business innovation activities up to innovation outputs and economic effects, which reflects the balanced national research and innovation system
- Concept of national innovation system has been adopted quite early in most of these countries (as well as in Austria, Belgium, The Netherlands, France...)
- Strategic decision-making as a highly participative process (on the policy as well as program level): importance of councils, independent expert juries, advisory bodies & consultant services, business representatives
- In the national innovation systems of DK, FI, SE and DE the different organisations are *separated*: policy makers, financiers, research institutes and implementation bodies are separated, BUT *integrated and cooperative* with one another (on the federal level not many redundancies and overlaps)

Innovation systems: Observations in European countries

Common features of the innovation leaders' innovation systems

- High degree of strategic and budgetary autonomy of funding organisations (e.g. TEKES in FI, DFG in DE, VINNOVA in SE)
- The regional dimension in innovation policy – primarily in SE, FI, DE and AU – is regarded as an important platform for implementing national policies; furthermore, the federal states (regions) are complementing the national innovation system with own instruments
- Public R&D infrastructure consists of state-run, but autonomous universities and polytechnics, large, non-university scientific organisations (DE: Fraunhofer-Gesellschaft, Max-Planck-Gesellschaft, Leibniz-Gemeinschaft) as well as government research institutes (FI, DE)
- Different functions of R&D institutes within the innovation systems: education, basic, applied research; general trend: competitive “third-party funds” increase to comply with evaluation criteria and compensate reduced basic-funding

Points for Discussion

- Which national objectives to be achieved? Endogenous potentials as a basis for establishing national innovation system?
- Which infrastructures are in place, which are missing?
- Compensate the lack of "critical mass" in small countries by international collaboration?
- Science-push in combination with market pull? Which instruments to apply?
- Foreign companies and integration into international value chains as important factor – which strategy and instruments to design?

Thank you!

Innovation infrastructure: General remarks

- Building the Innovation Infrastructure with a focus on the entire material, organisational, institutional and personal factors which are available in a work-sharing economy dependent on qualified labour, (applied) research, technology and innovation
- Main assumption: the business sector, especially innovation and technology-oriented companies are the main drivers of economic progress, income and wealth
- However, national and regional governments and public administration take over a crucial role in building the innovation-related infrastructure and creating favourable framework conditions, particularly with a view to institutions and incentive structures
- Public sector can take over the role as driver for certain innovations or the development of technologies (public procurement)

European Collaboration : Integrated Infrastructure Initiative (I3) of the EU

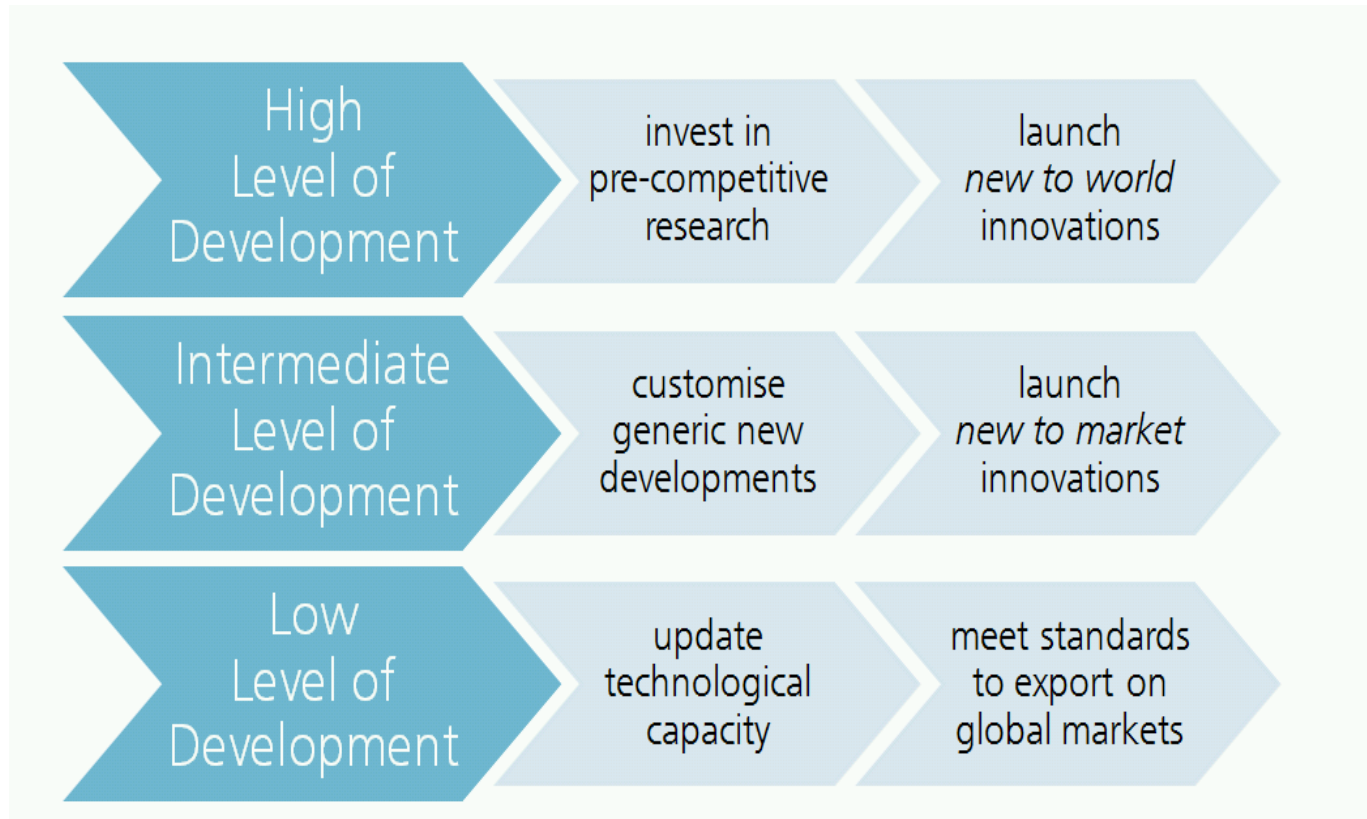
The Integrated Infrastructure Initiative (I3), was developed to better improve the access to important research infrastructures by means of concrete project-based networking activities.

	Budget FP 6	% Budget FP 6	Budget FP 7	% Budget FP 7
BELGIUM	8.7	2.6%	0.0	0.0%
DENMARK	0.0	0.0%	7.8	2.1%
FINLAND	0.0	0.0%	5.4	1.5%
FRANCE	79.4	23.5%	92.3	24.9%
GERMANY	46.3	13.7%	66.8	18.0%
GREECE	0.0	0.0%	10.7	2.9%
ITALY	76.1	22.5%	80.2	21.6%
NETHERLANDS	17.5	5.2%	18.1	4.9%
NORWAY	0.0	0.0%	4.6	1.2%
SPAIN	0.0	0.0%	9.0	2.4%
SWEDEN	0.7	0.2%	12.4	3.3%
SWITZERLAND	12.1	3.6%	39.0	10.5%
UNITED KINGDOM	96.7	28.6%	24.4	6.6%
DE; FR; IT; UK	289.5	88.3%	263.7	71.1%
Total	337.7		370.7	

Budget allocated for I3 projects co-ordinated by country

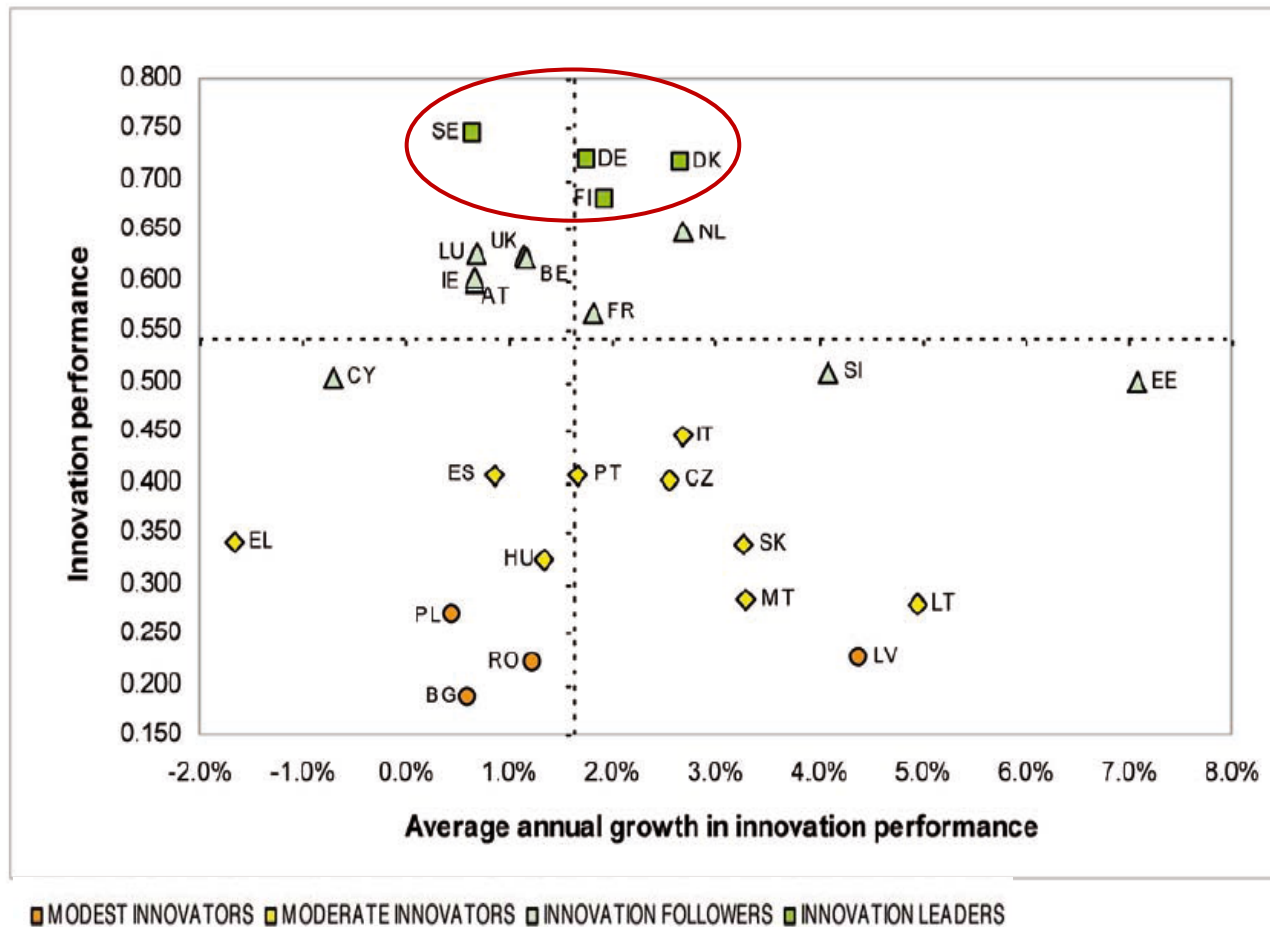
Source: own calculation based on <http://ec.europa.eu>

Different technological Challenges at different Levels of Development



Source: Source: Own figure, based findings of Lall (1992); Gu (1999); Kim (1999); Wong (2001); Ernst (2002); ADB (2011)

Innovation performance 2008-2012: Observations in European countries



Source: Innovations Union Scoreboard 2013

Agenda

1. Achieving national/regional competitiveness by building innovation infrastructure
2. Typical challenges as regards innovation systems
3. System-forming elements
4. Observations in European countries
5. Points for discussion