GSBC - EIC

Innovation policy's role in helping manufacturing SMEs create and keep a competitive edge.

Experience of Germany

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INNOVATION CONFERENCE FOR THE DECISION MAKERS: ROLE FOR THE GOVERNMENT

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1. Importance of SMEs for innovation
2. Innovation and obstacles
3. SMEs in Germany - performance
4. SME innovation policies in Germany
5. Innovation over time
6. Policy design and SMEs
7. The New Role of the State - Conclusion

1. IMPORTANCE OF SMEs FOR INNOVATION

- The great importance of SMEs for employment and innovation is often emphasized.
  - Backbone of the German industry
  - Industries that are characterized as specialized suppliers; e.g. machinery, automotive industry suppliers

- SMEs as drivers of newly emerging technologies and industries
  - industry life cycles
  - technology life cycles

- SMEs as initiators of new GPTs
  - techno-econ paradigms, long waves
  - drivers of transformation dynamics

2. SME INNOVATION AND OBSTACLES

Percentage distribution of obstacles to innovation in innovation-active SMEs (5 to 249 employees) in Germany, 2012 to 2014

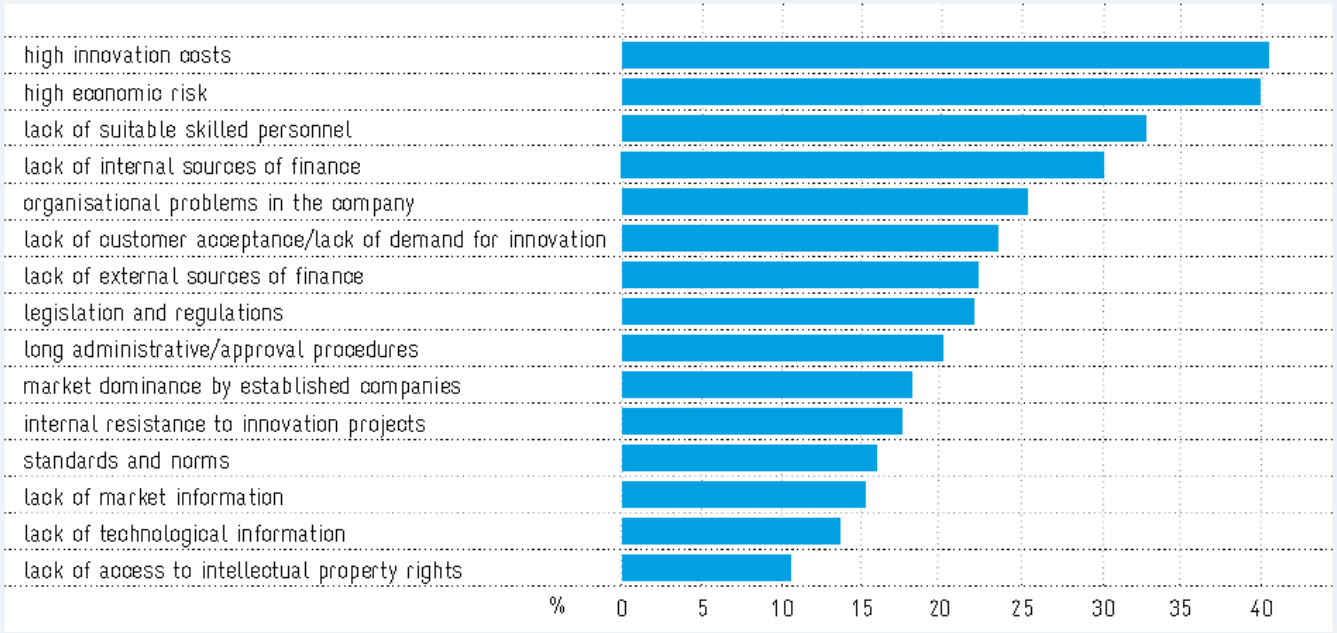
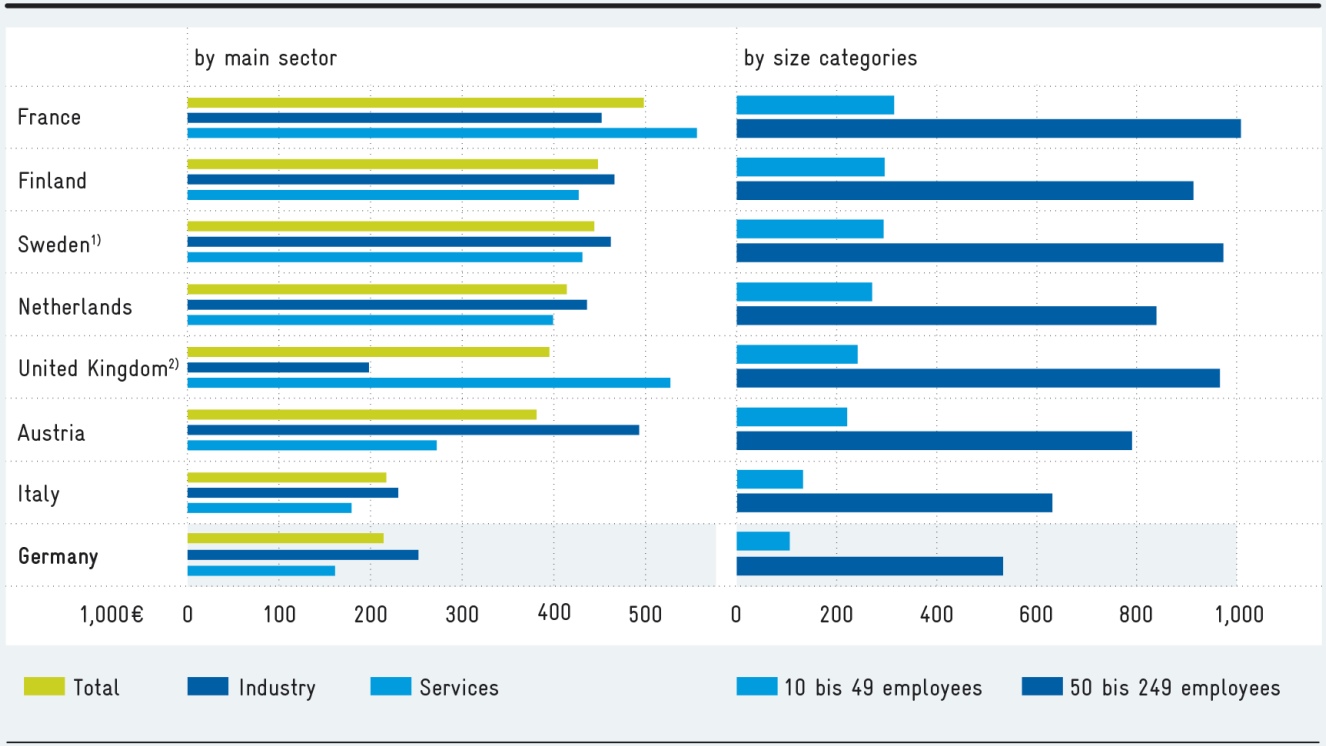


Chart covers obstacles to innovation that have led to delays, the abandonment or the non-implementation of innovation projects.
Source: Mannheim Innovation Panel. Calculations by ZEW in Rammer et al. (2016)

3. SMEs IN GERMANY - PERFORMANCE

Innovation Expenditures per Innovative Firm - average of 2008, 2010 and 2012



1) only 2008, 2) only 2012.
Source: Eurostat: Community Innovation Survey. Calculations by ZEW in Rammer et al. (2016)

- The innovation intensity and innovation expenditure of German SMEs are, on average, low by international comparison

German SMEs in International Comparison

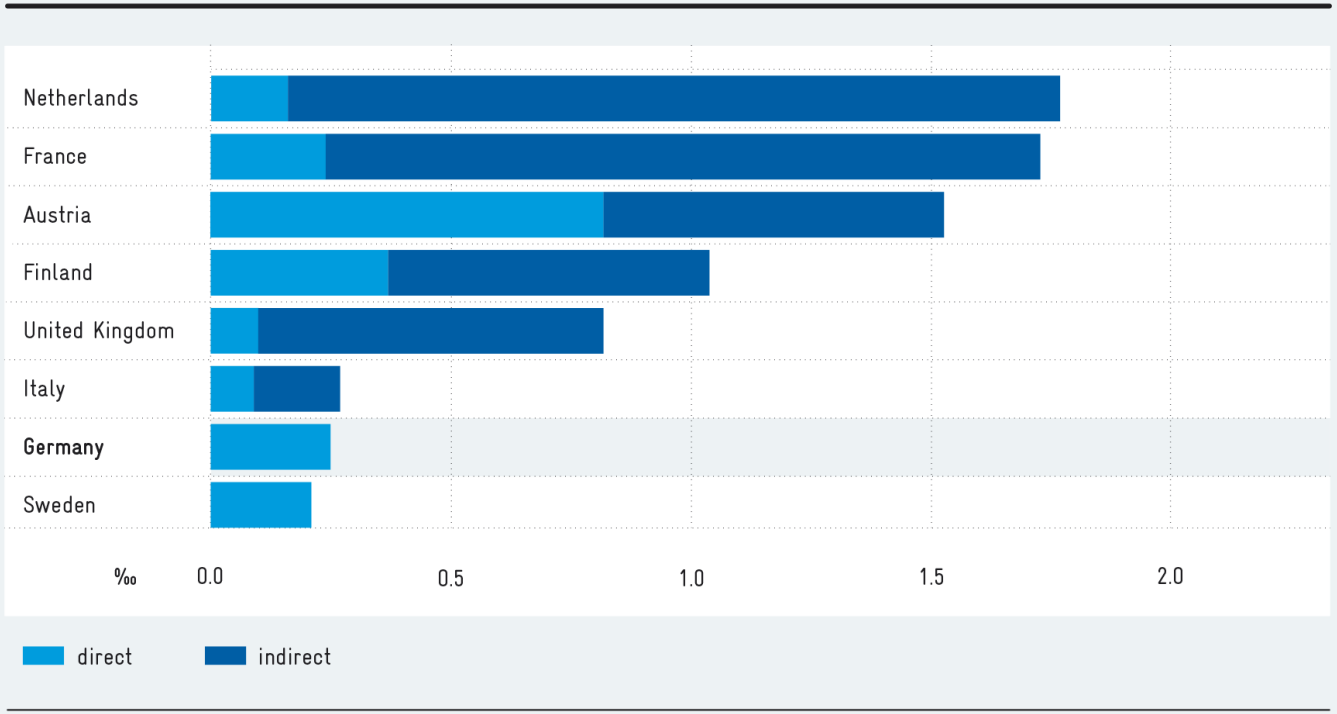
Patents		Innovations		Revenue	
Transnational patent applications by SMEs (< 500 employees) per million inhabitants		Percentage of SMEs (10 to 249 employees) with product or process innovations		Product innovations' share of turnover of SMEs (10 to 249 employees)	
Sweden	137	**Germany**	**42%**	United Kingdom	18%
Finland	132	Netherlands	41%	France	8%
Austria	104	Finland	40%	Italy	8%
Germany	**87**	Sweden	40%	Netherlands	7%
Netherlands	82	Italy	39%	**Germany**	**6%**
United Kingdom	50	Austria	36%	Austria	6%
France	45	France	32%	Finland	5%
Italy	44	United Kingdom	28%	Sweden	5%

Source: EPA: Patstat, Eurostat: Community Innovation Surveys. Calculations by Fraunhofer ISI and ZEW in Rammer et al. (2016).

- Patent activities and innovation successes reveal a mixed picture

4. SME PROGRAMS IN GERMANY

Direct and indirect public financing of R&D by SMEs as a percentage of total R&D expenditure by SMEs



Direct funding: most recent available year = 2013, 2012 or 2011, depending on the country. Indirect funding: mean of indirect funding in 2012 and 2013.
Source: OECD: Research and Development Statistics, Main Science and Technology Indicators. Calculations by ZEW in Rammer et al. (2016).

- In reference countries with R&D tax credits, the percentage of publicly financed R&D expenditure by SMEs is significantly higher than in Germany

Overview of Federal Government R&D funding benefiting SMEs

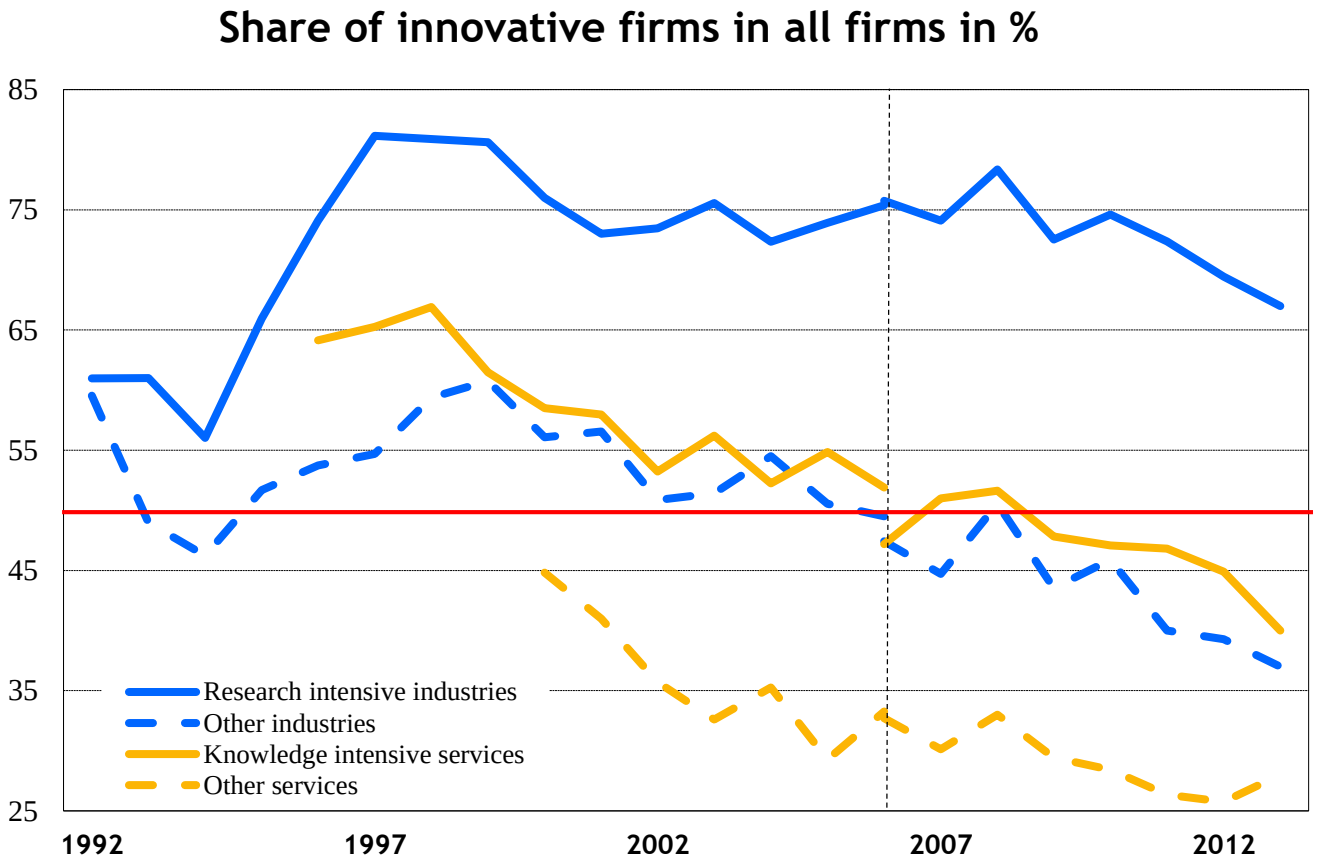
	Technology-open BMWi measures benefiting SMEs (IGF, INNO-KOM-Ost)*	ZIM	KMU-innovativ	Specialised programmes of the Federal Gov.
Target group	Research institutions or not-for-profit external industry research institutions (economically active SMEs benefit indirectly by using research results)	SMEs according to EU definition (higher headcount threshold: < 500 employees)	SMEs according to EU definition (in individual technology fields: extension to up to 1,000 employees and turnover of €100 million per year)	open (EU definition of SMEs sets framework for funding quotas)
Funding limit	none (IGF) €500,000 (INNO-KOM-Ost)	€209,000 (max. eligible costs: €380,000)	none	none
Number of newly funded projects per year (annual approvals, average figures for 2013-2015)	approx. 420 (IGF) approx. 220 (INNO-KOM-Ost)	approx. 2,900 (only SME projects, total approx. 4,300 projects, i.e. approx. 1,400 sub-projects of cooperating research institutions)	approx. 280 (only SME projects; total of approx. 500 projects – i.e. about 220 sub-projects of the R&D partners, usually research institutions)	approx. 2,600 (only SME projects; total of over 13,000 projects)
Funding paid out for or to SMEs per year (average figures for 2013-2015)	approx. €140m (IGF) approx. €60m (INNO-KOM-Ost)	approx. €320m (plus funds to cooperating research institutions: approx. €190m)	approx. €60m (plus funds to R&D partners in the projects, usually research institutions: €50m)	approx. €480m (EU definition; incl. KMU-innovativ, only funds that go direct to SMEs; funding to R&D partners used for research services for the benefit of SMEs cannot be shown separately)

* Other BMWi programmes benefiting SMEs – such as the ERP Innovation Programme, go-Inno innovation vouchers, the SIGNO or WIPANO programme, the High-Tech Gründerfonds and the EXIST programme – are not included in the calculation here because of their different approaches to funding.
Source: Written information from BMBF and BMWi.

5. INNOVATION OVER TIME

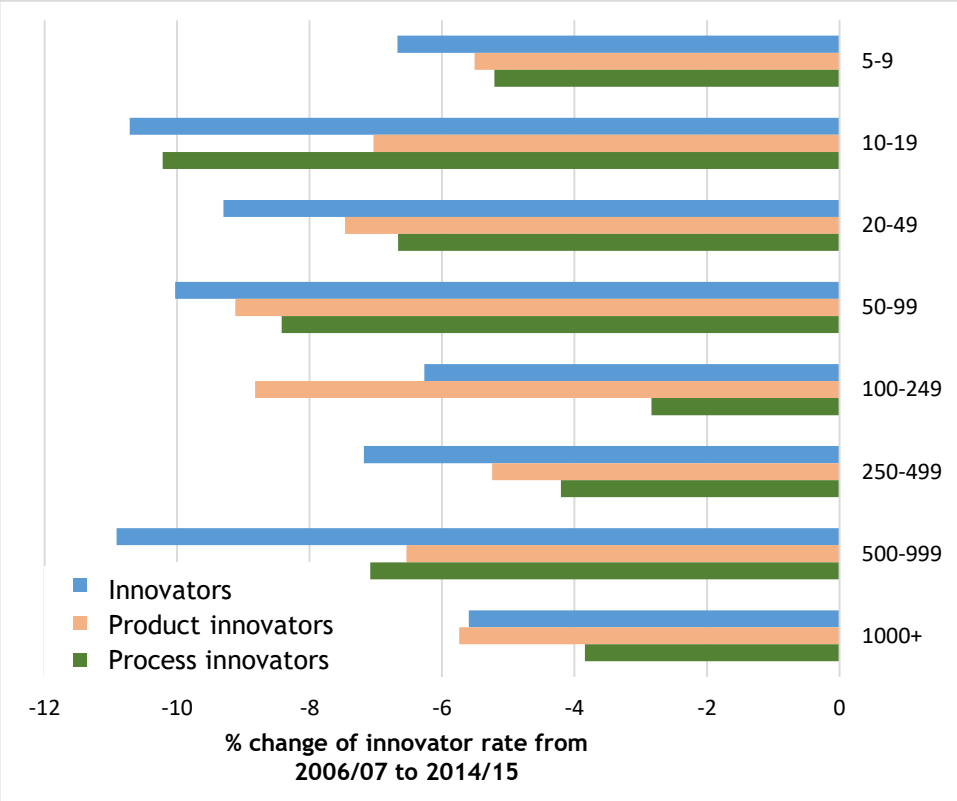
Innovation slowdown: Innovator rates

- Germany
- Declining innovation activities in Germany
- Clear decline already before 2008
- and also after 2008 despite
  - prosperous economic development
  - easy credit conditions



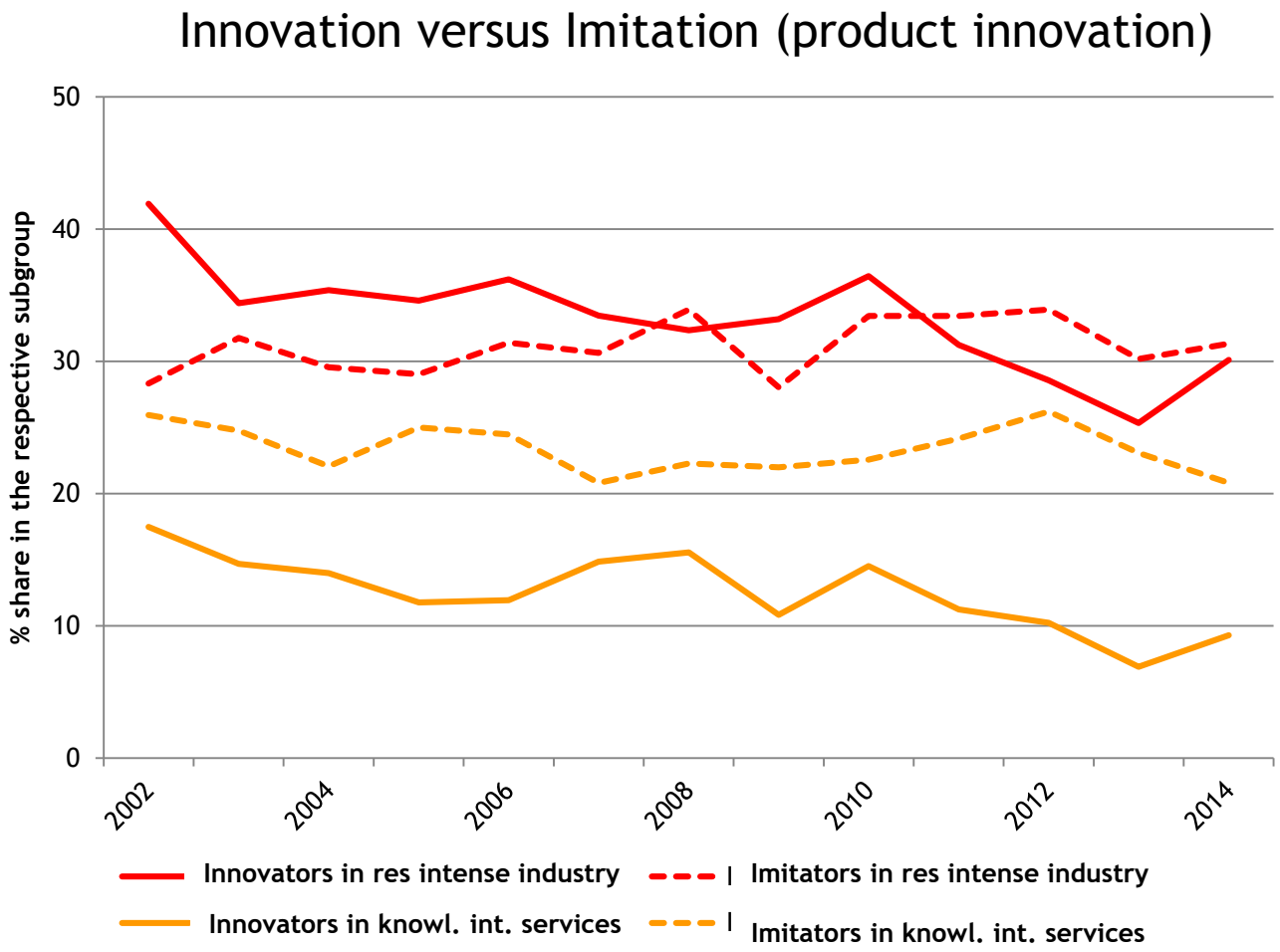
(MIP various years)

Change in innovator rates 2006/07 to 2014/15 by size class and type of innovation in Germany (Basis National Statistics)



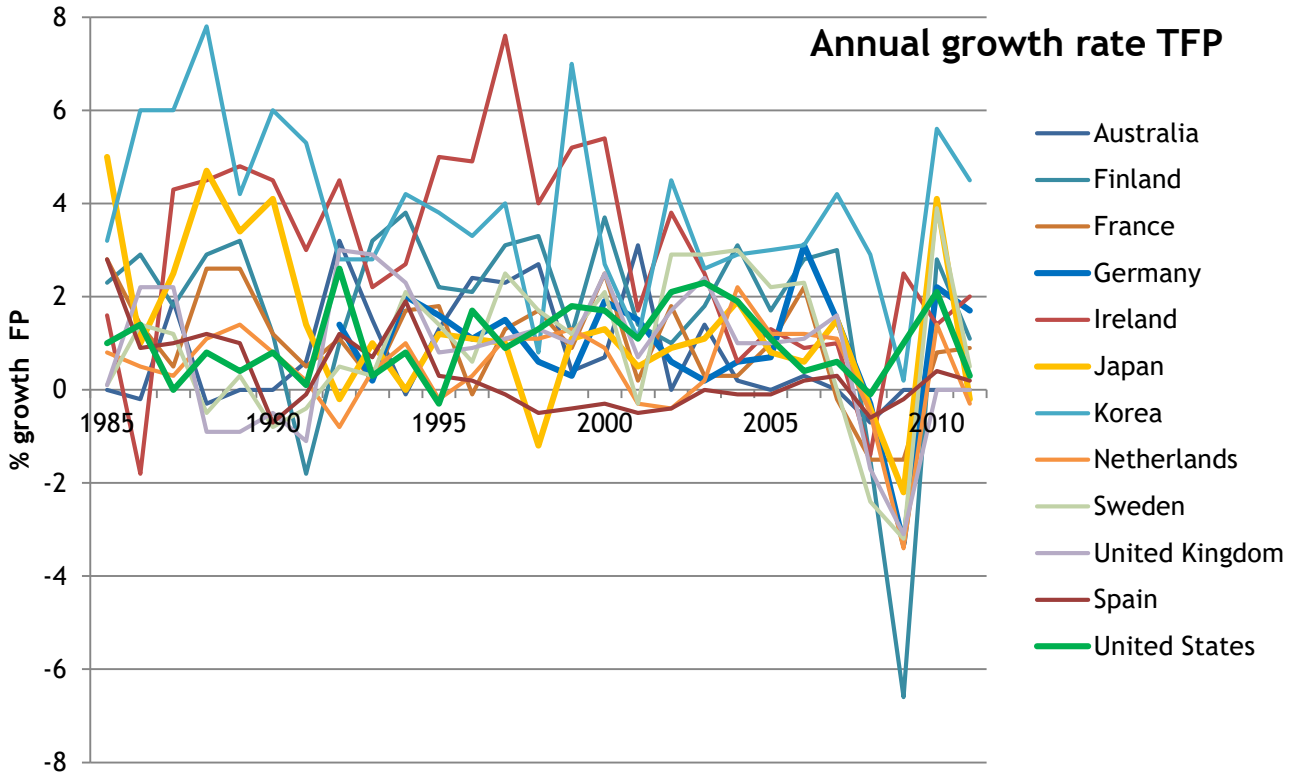
(Source: ZEW 2018)

Change in innovator rate and degree of innovativeness



(Source: Cantner (2016), MIP several years)

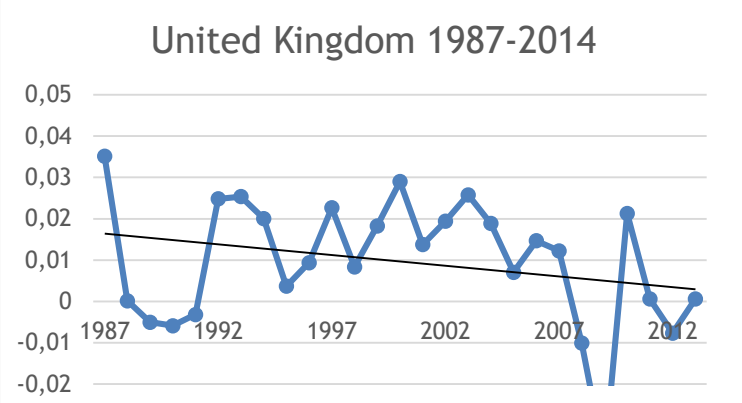
- **Growth rate of TFP as indicator of technological change**
- **A slightly negative development** (less for US and D)
- **Drop in the aftermath of the 2008 financial crisis**
- **Slowdown of technological change?**

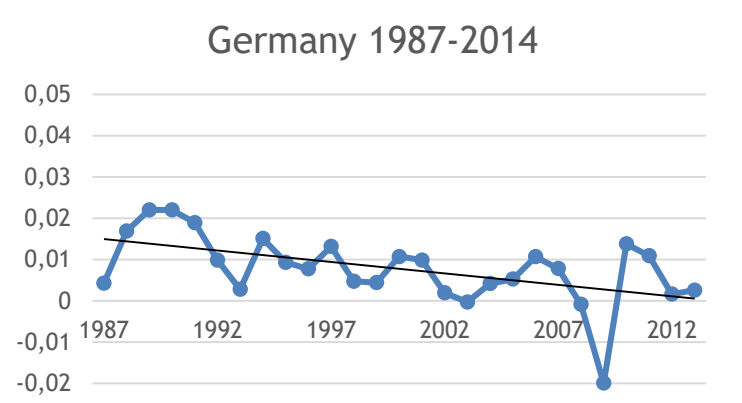


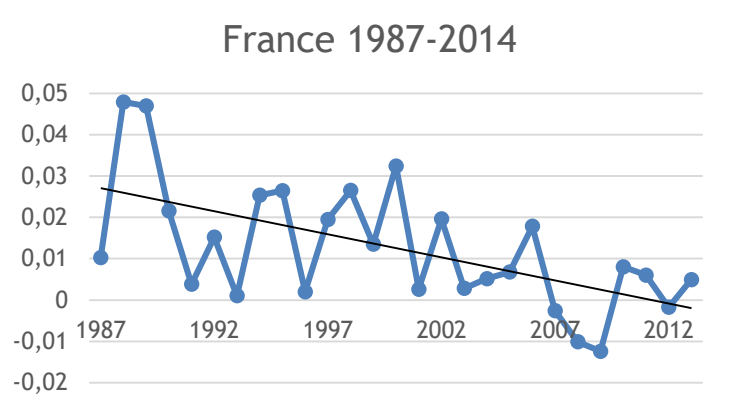
(OECD)

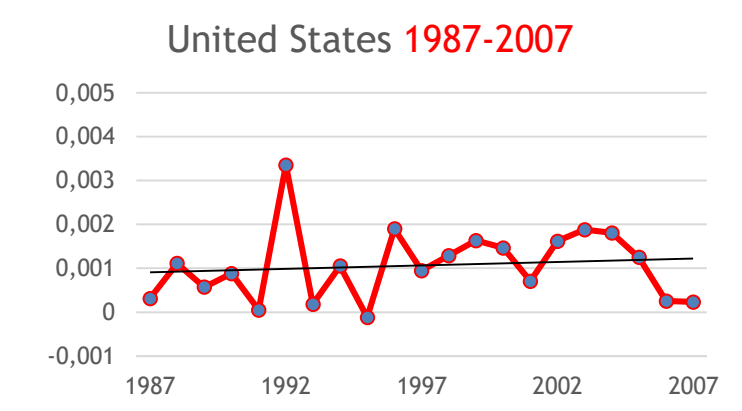
$$\frac{\Delta TFP_t / TFP_t}{R_t}$$

- Bloom et al 2017
- International
- Declining research productivity
- US rather constant





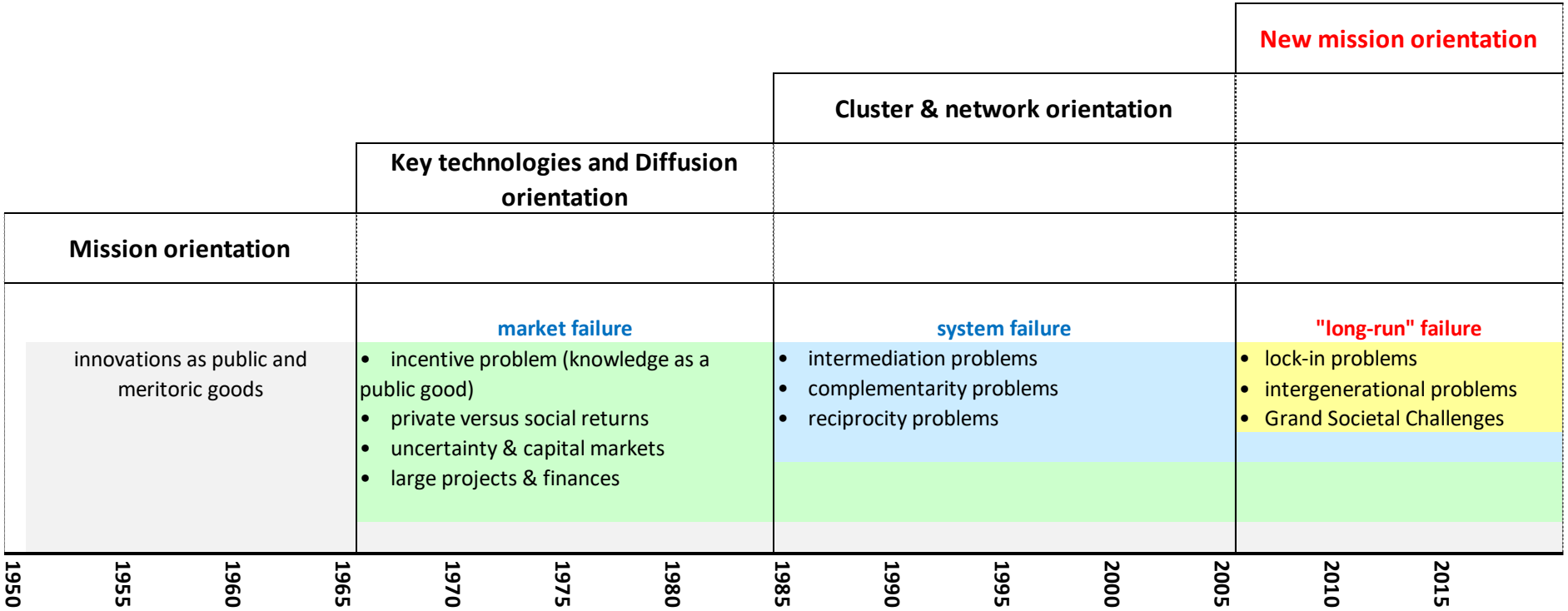




(Cantner, Prytkova, Vannuccini 2017)

6. POLICY DESIGN AND SMEs

Policy styles in time



From explicitly addressing a **specific technological solution** (*mission* such as nuclear power) toward emphasizing a **broader range of problem solution** (*new mission* policy such as renewable energies)

Own elaboration based on Fier and Harhoff (2003)

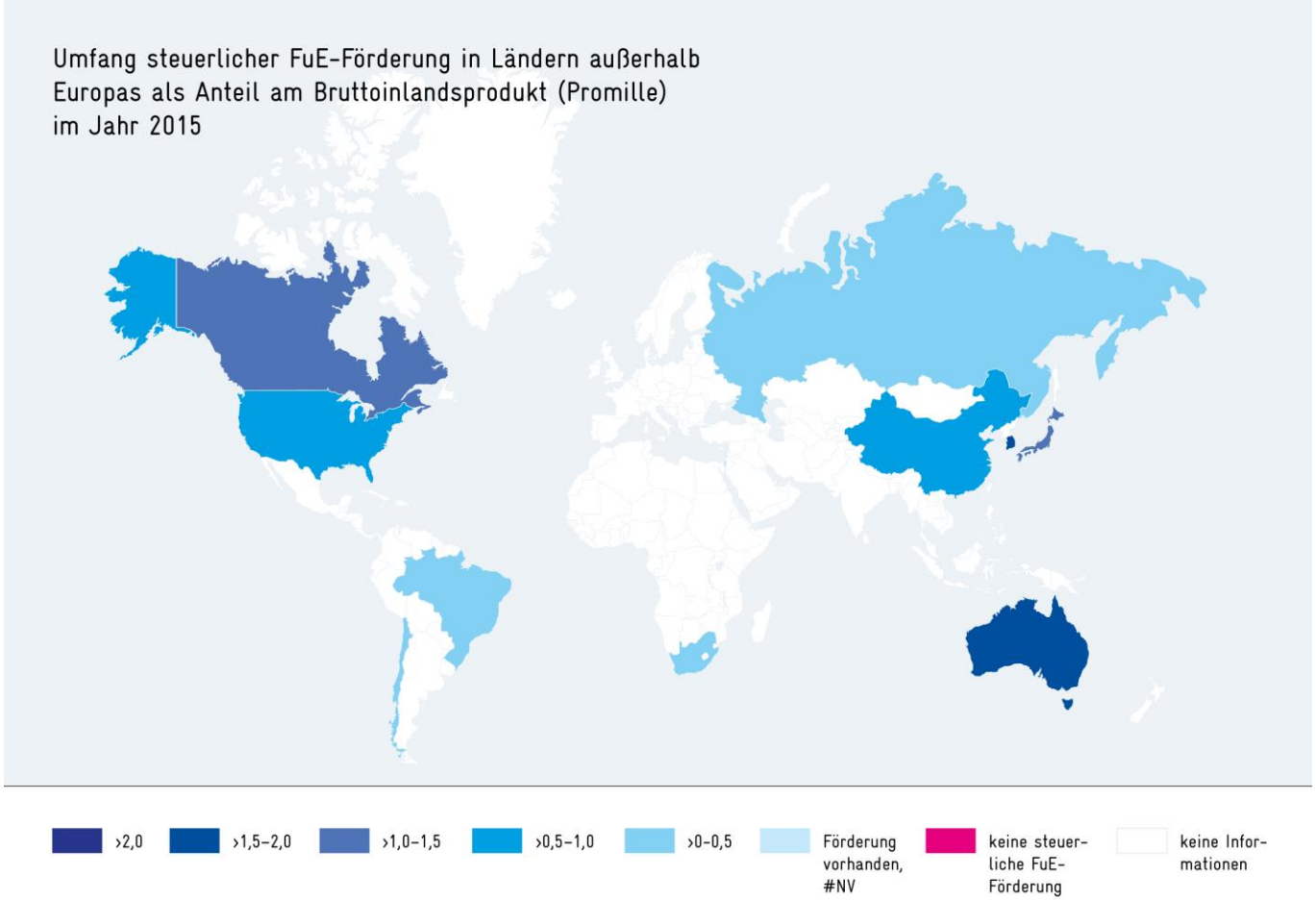
- Suggested **Catalytic Policy Concept** (Cantner and Vanuccini 2016)

- **Direct policy measures** to induce directional change
  - New mission policy (to be distinguished from traditional mission policy)
  - Open corridors and allow firms to select
  - In Germany: High-tech Strategy and Grand Societal Challenges

- **Mobilization** of innovators and innovative imitators into the selected directions
  - R&D tax credit

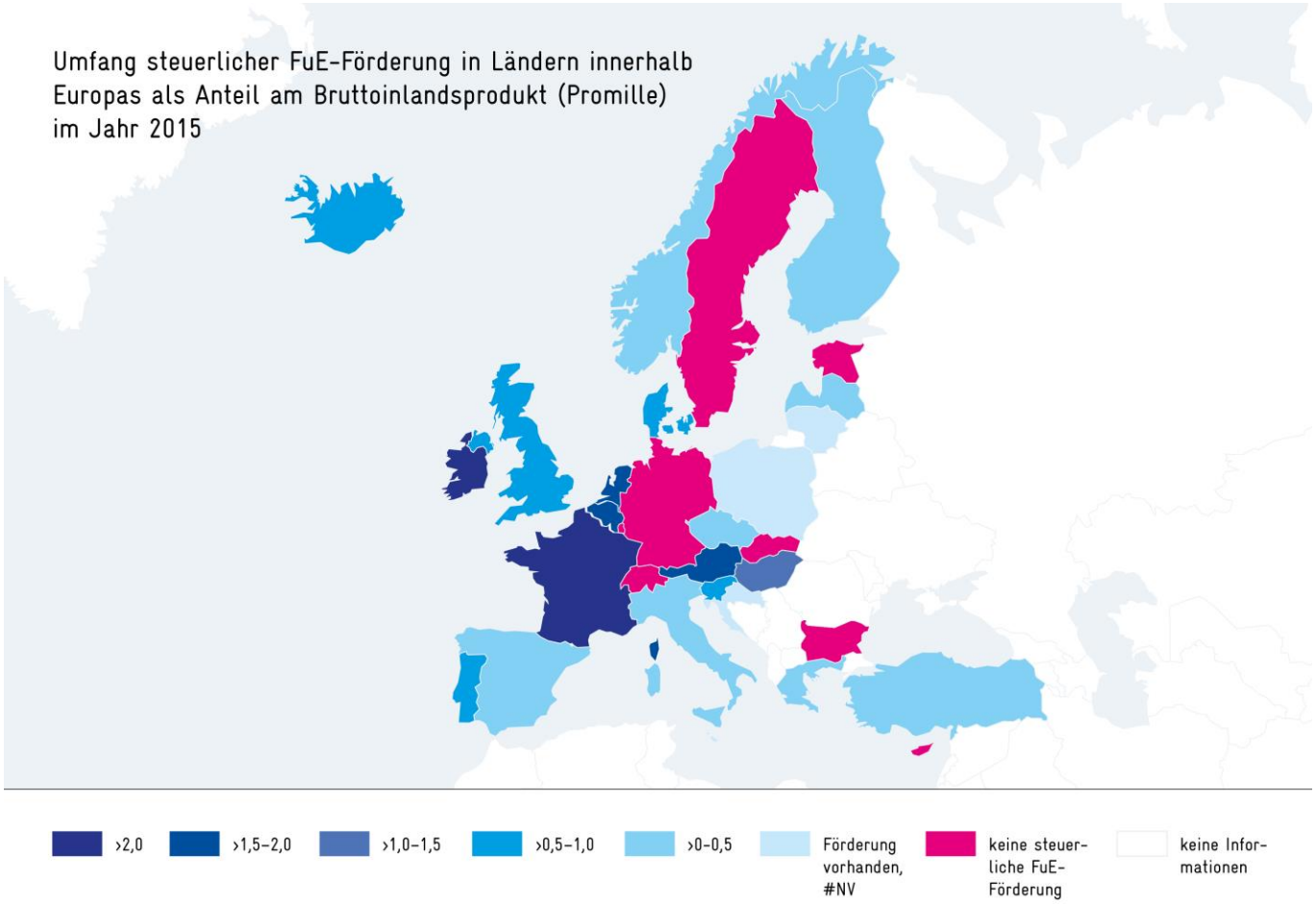
- **Drivers of directional change** are SMEs and newly founded firms
  - Address policy dimensions explicitly to this group

R&D tax credits worldwide w/o Europe



Quelle: EFI 2017

R&D tax credit in Europe



Quelle: EFI 2017

- R&D tax credit with a focus on SMEs:
  - Easy to apply for and low level of application burden
  - Reduction of financial risks and uncertainty related to innovation
  - Reduction of R&D costs leads to more than proportional increase in R&D expenditures

- Alternatives:
  - Alternative 1: tax credit for all R&D expenditures in the context of firm income taxation
  - Alternative 2: tax credit for all R&D expenditures for R&D staff and monthly clearing with tax on wages

- Alternative 2 exhibits a higher ability to plan and larger positive liquidity effects

7. THE NEW ROLE OF THE STATE - CONCLUSION

THANK YOU FOR YOUR KIND ATTENTION