

Business/Innovation Eco-Systems in Europe – an empirical study

Symposium Entrepreneurship and the Geography of Innovation

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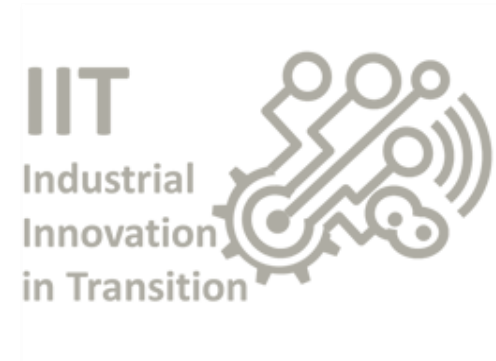


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The Industrial Innovation in Transition (IIT) Project

- The team:



UNIVERSITY OF TWENTE.



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The Industrial Innovation in Transition (IIT) Project

- “The *Industrial Innovation in Transition (IIT)* project aims to understand **how innovation processes in European industry are changing** [in the past 10 years] and to disseminate the best practices in this field between companies and government agencies.”
- **694 company case studies** during 2015-16
- **11 European countries** (Austria, Czech Republic, Estonia, Finland, Ireland, Italy, Germany, Netherlands, Portugal, Spain and United Kingdom)
- **5 sectors** (Agri-Food, Bio-Pharmaceutical, Clean-Technology, ICT and Manufacturing)

The Industrial Innovation in Transition (IIT) Project

- Central instrument: a survey of innovative companies using in-depth interviews. Recorded, transcriptions subsequently coded for quantitative & qualitative analysis (n=694).
- Survey to triangulate hypotheses from the interview analysis (n=315).
- Key areas of investigation:
 - Business/ Innovation **Ecosystem**
 - New Tools for Innovation Management
 - **Open Innovation**
 - Innovation Management and Practice
 - **Absorptive capacity** of firms
 - Further aim to assess **adequacy of current policy frameworks and instruments**

Starting points – perceptions of a changing paradigm

- Long term structures of ***post-war science and innovation built around largely self-sufficient major firms*** benefitting from science as a public good
- From 1980s cost pressures, rapid pace of technological change in critical technologies and political pressure for science base to demonstrate its contribution to socio-economic goals ***shifted system to a greater focus on externalisation / outsourcing and market transactions***
- Policy thinking followed and ***key concepts of innovation systems were matched by stronger emphasis upon promoting collaboration***
- By early 2000s crystallizing into concepts of ***open innovation and innovation ecosystems***

Key characteristics of the shift in innovation paradigms

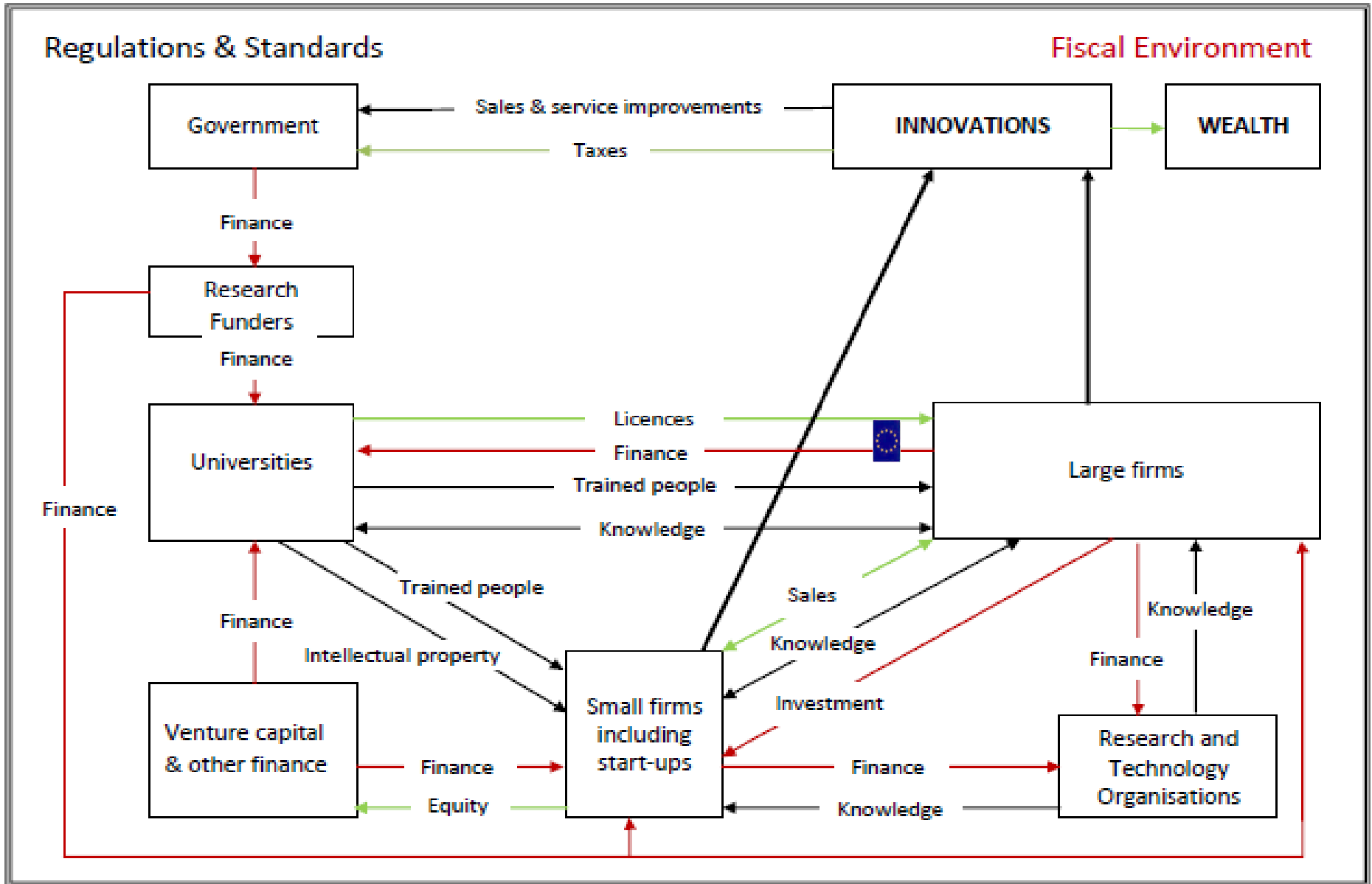
- Large multiproduct, multi-technology firms **complemented** by dynamic population of smaller companies sustained by venture capital.
- Complex **patterns of birth, growth, acquisition, or death** of the firms enable effective selection of technologies.
- **Increased outsourcing** of R&D to specialist organisations & universities.
- Networks and alliances **built around technologies, standards and supply chains**.
- Globalisation in R&D **driven more by local capabilities in people and scientific institutions**.
- **Lead markets precede adaptation** to markets.

Distinguishing innovation ecosystems

- The innovation ecosystem focuses upon the dynamics of the wider environment in which innovation takes place. It ***encompasses both the ‘opening up’ of innovation & the focus on institutions*** in the innovation systems approach.
- The distinction is on understanding interactions, flows and interdependencies at a systemic level:

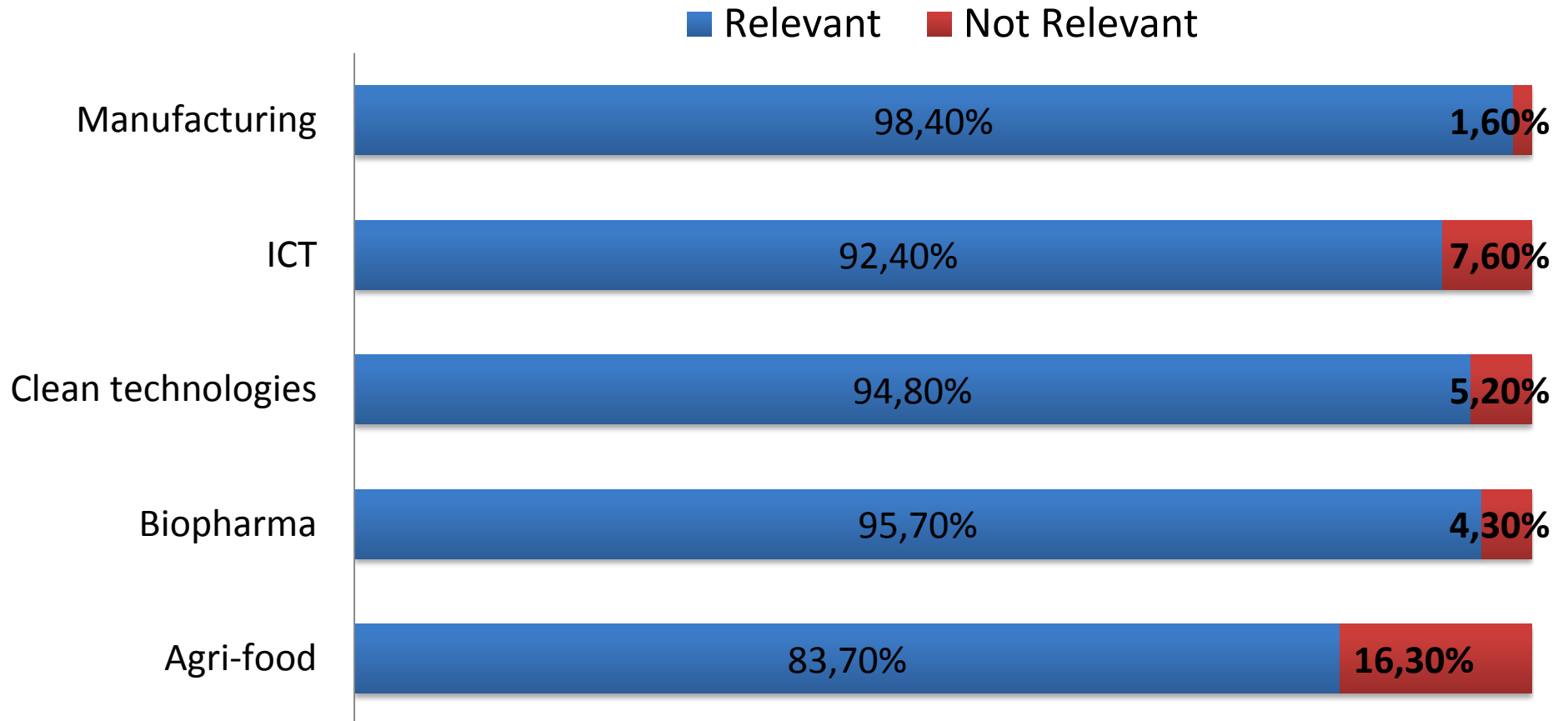
“The added value of thinking of this system as an ecology is the focus it brings to the distribution and abundance of research performers and knowledge and their interactions with each other and the broader environment” (ERA Rationales Report, European Commission 2008: 23)

Elements of Innovation Ecosystems

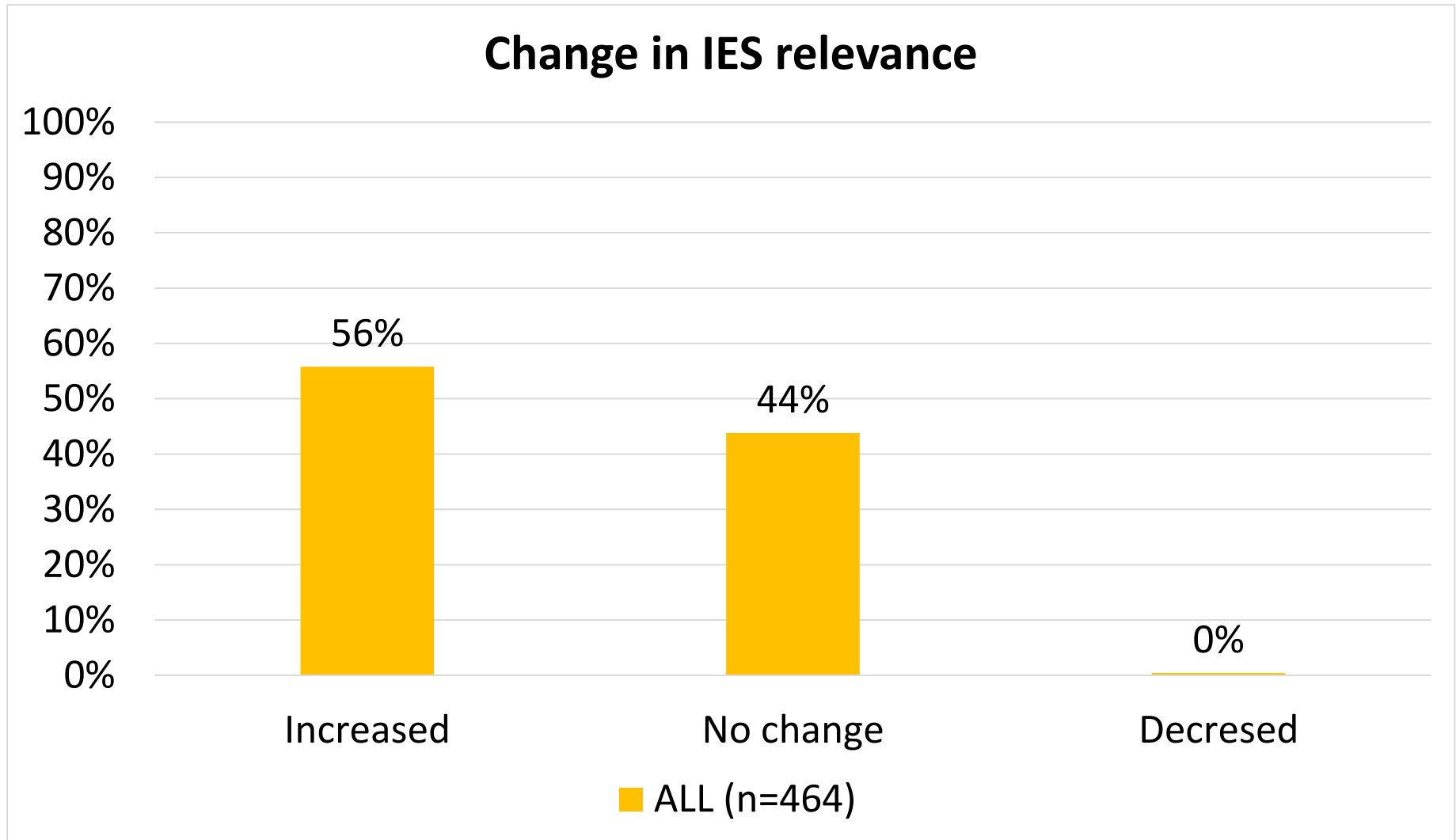


Source: L. Georghiou cited in House of Commons Select Committee on Science & Technology Report Bridging the valley of death: improving the commercialisation of Research, March 2013

Percentage of firms considering ecosystem concept relevant for their innovation activities (interviews)

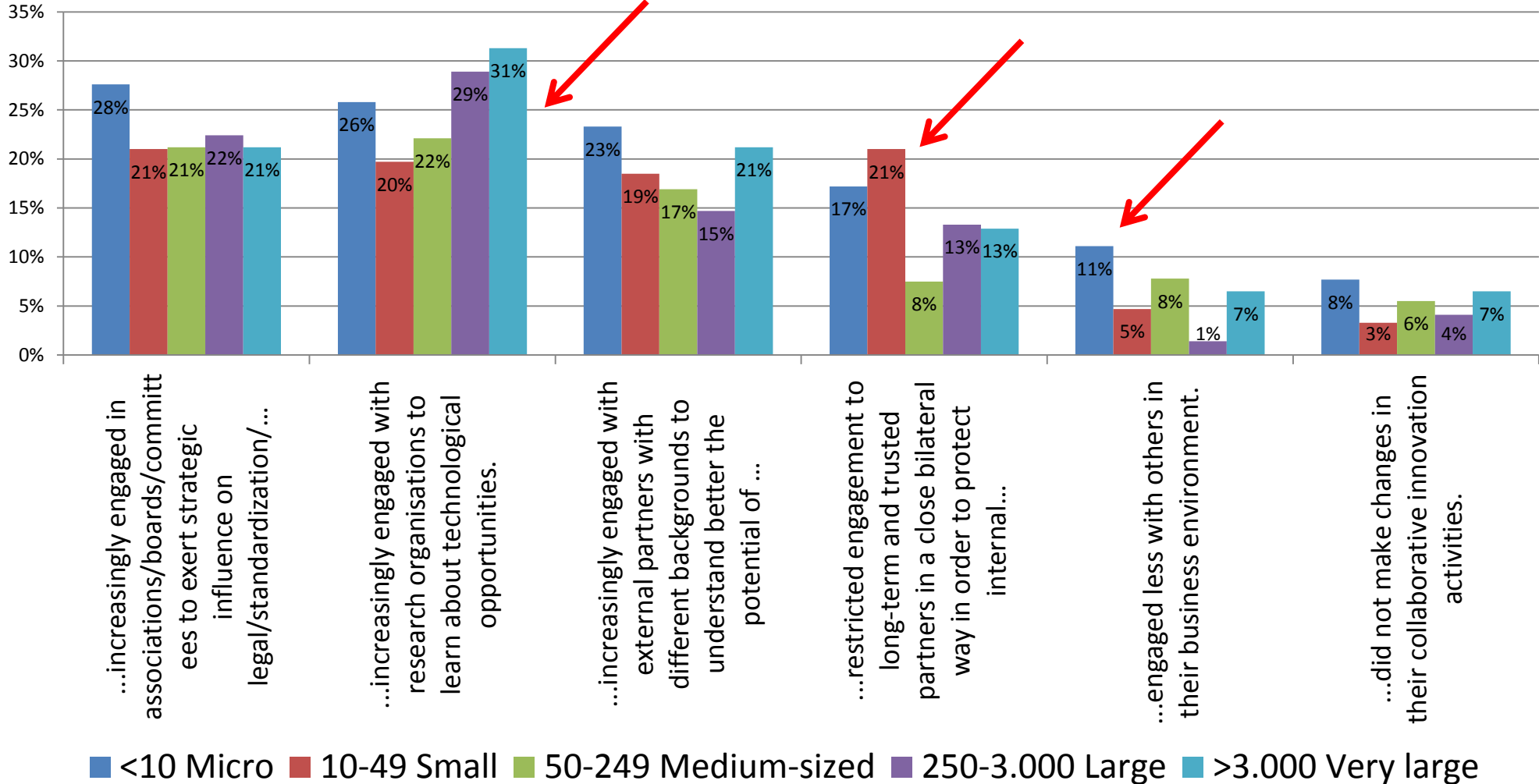


(Overall) Change in relevance of innovation ecosystems in the last 5-10 years

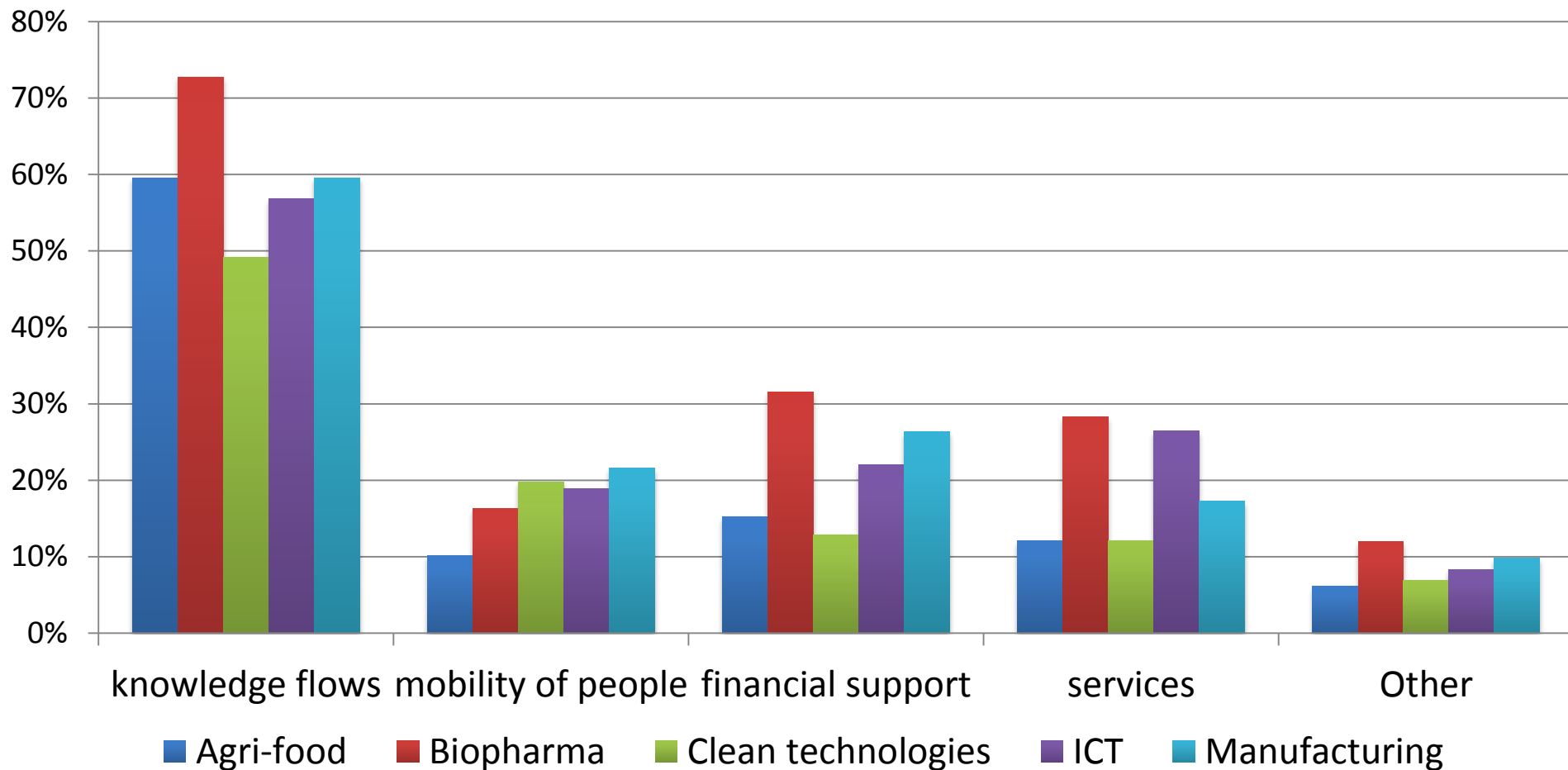


Innovation ecosystem approaches: by company size (% of answering: fully agree, from survey)

During the last five years companies ...



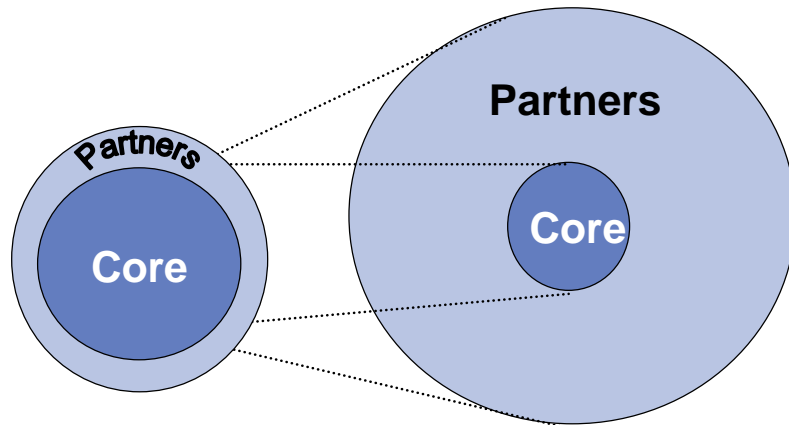
Most important elements of the innovation ecosystem (source: interviews)



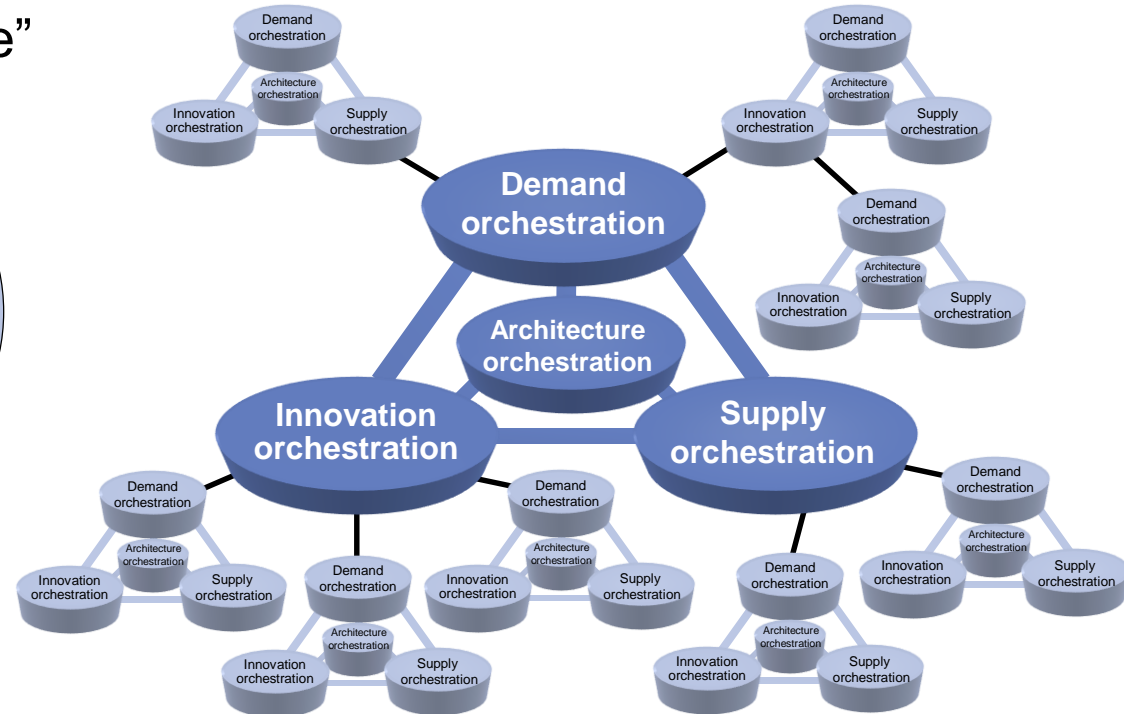
Innovation Ecosystem

enable new ways of knowledge creation and utilization

to "extended enterprise"



with "orchestration capability"



Ecosystem perspective on innovation policy leads to different questions

- ***Is the population of actors ‘balanced’?***
 - Country/region has a balance between large multiproduct, multi-technology firms who can act as system integrators and coordinate ecosystem ‘initiation’, ‘maintenance’ and ‘development’?
 - Is there a dynamic population of smaller companies sustained by venture capital who can provide innovative ideas and products?
 - What is the role for established SMEs?
 - How different does this ecosystem look across sectors? Are those differences driven by the nature of the technology and/or market or historic drivers?
- ***Is there sufficient demand for innovation in the system?***
 - Are public and private procurers sufficiently capable and incentivised to drive demand for innovation?
 - Are new solutions being crowded out by lock-in to existing standards, regulations and structures?

Organising policy: capturing value and levers for change

- The *innovation ecosystem leaders often design the roles of different actors* (and their share of the value generated), coordinates interactions within the ecosystem and between ecosystems, and orchestrate resources flow between different partners as the system evolves (Adner, 2012)
- Therefore, *innovation ecosystem leadership affects the innovation trajectories of the all of the actors involved* – underperformance or excessive dominance over value capture may require levers to change innovation ecosystem leadership.
 - Licensing, corporate venturing and scaling-up new firms could *induce a change in dominant actors or knowledge* and be the target for policy interventions.
 - A policymaker may *apply incentives to change framework conditions* such as reducing barriers to mobility.
 - Companies may seek to establish new ecosystems. (e.g. via OI)



Role of Policy in Innovation Ecosystems

- The policymaker's role is not 'Olympian' overview - ***lack of any objective position and the essence of an ecosystem is shared governance.***
- ***Policymakers become active players, able to adjust the balance, enhance or moderate flows through certain instruments***, e.g. foresight and platforms to develop IES leaders, and ***frameworks of instruments.***
- ***Policy adapts with ecosystem evolution?*** Early stages are potentially volatile, viable networks require certain conditions, resources and activities (Dedehayir et al., 2016).

Core problem: policy boundaries and innovation ecosystems

- Innovation ecosystems are often ***international and not always clearly focused on a particular technology field***, creating challenges for organising innovation policy.
- The ***value blueprint of different IES' results from the location of, and links between, innovation ecosystem actors***, with different advantages and shortfalls over time (Adner, 2012).
- Requires deployment of ***different instruments in different places, directed towards different actors at different times.***
- Best way to support a deficiency in one actor may be targeting a policy at another.

Future policy needs

- Emphasis on knowledge flows places focus on ***balance of actors & vectors of knowledge transfer*** – ‘population approach’
- Findings stress importance of customers and suppliers but few ***policy instruments explicitly aimed at supply chains***
- For new technologies challenge even greater to ***create new demand channels*** placing focus on procurement/lead market approaches
- Demand is a common deficiency in ecosystems explaining why national and regional administrations seek to attract and retain ***‘anchor firms’ but as these consolidate and become fewer in number*** there is a need for alternative approaches
- Need tools to ***open up underperforming existing innovation ecosystems*** (governance and demand) and create new ones
- ***Foresight needed as tool for ecosystem coordination***

Next steps and continuation

- Final report by End of July 2017
- Final Discussion with EU Commission September 2017
- Dissemination activities till December 2017
- Possibility for continuation of research, bringing in more partners from other countries (to be discussed and agreed upon with EU COM)
 - Trial access to project DB
 - Future extension of country basis, cooperation with the team and access to DB



Thank you for your attention !



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IIT

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Supplementary Slides



New Tools for Innovation Management

New innovation models and tools for innovation – such as the customer driven innovation model, web enabled tools and big data – allow companies to blend the physical and virtual worlds of innovation activities and they have become important means of supporting effective innovation practices.

- The physical and virtual worlds blend allowing people to contribute and be involved
- Clouds, Do-It-Yourself (DIY), social media, blended worlds and sensing surroundings will become key platforms for innovation.
- Creativity and imagination combined with good competence are key characteristics of future innovators.



Open Innovation...

...is the opening-up of innovation processes to allow ideas, new technologies or feedback from external partners to flow into the company, or actively seek out and use external knowledge.

Engaging external partners:

- access and drive global intellectual vision and insight
- form strategic collaborations with world-leading institutions to multiply our efforts
- build global test beds to learn from broader audiences



Open Innovation/Knowledge Sharing

- Complementary competence and excellence
- Genuine commitment for knowledge sharing/trust
- Collaboration platforms/joint campus presence
- Mobility of research personnel
- R&D/recruitment/education all involved
- Transparent management and collaboration rules
- Fair rules for IPR ownership and use
- Reformed reward and incentive systems



Innovation management and practice

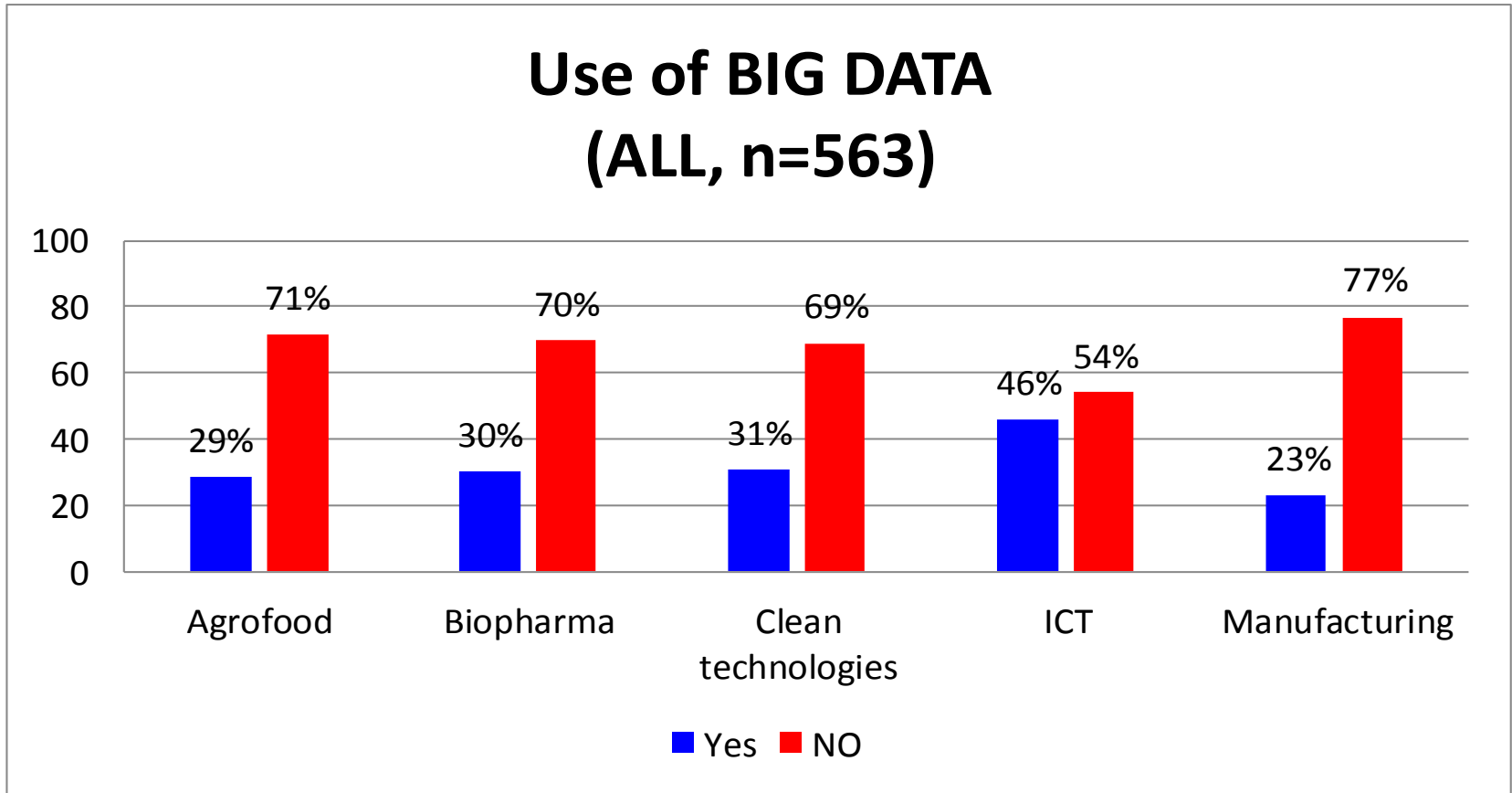
The key question regarding the management structure of the innovation processes within a company is whether innovation activities take place in different business lines/units or within a centralized R&D department. The IIT results indicate that both principles are used by companies, and oftentimes in combination.

- State-gate model dominates
- Still most initiatives cost driven
- Top management has decisive role
- Dedicated central innovation committee
- Innovation knowledge sourced outside more important, but often difficult to absorb
- Changes in innovation management practice still in progress (customer involvement, business incubators, independent innovation units, web-enabled innovation platforms, etc.)





Big Data usage in Innovation; Industry Sectors



Open Innovation

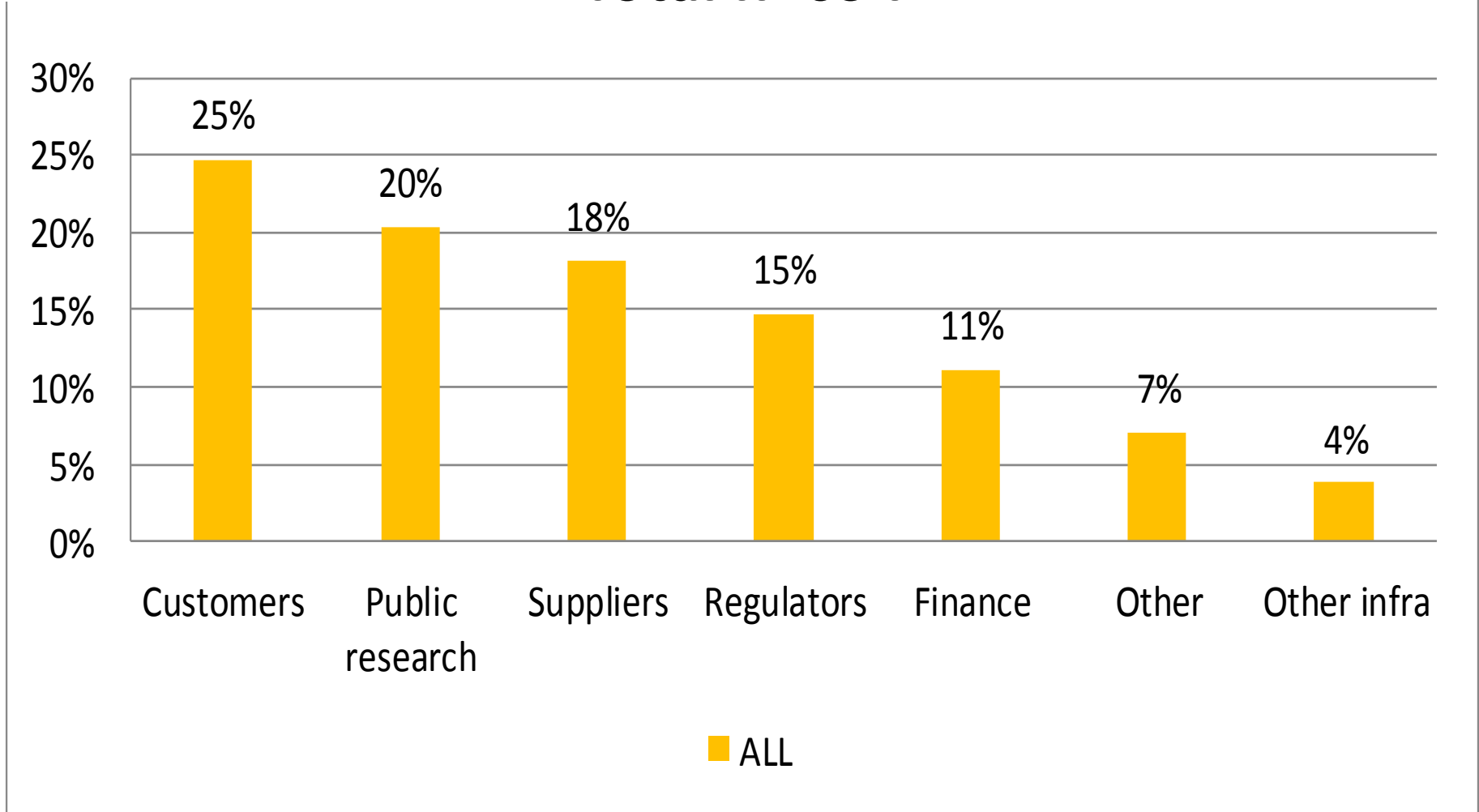
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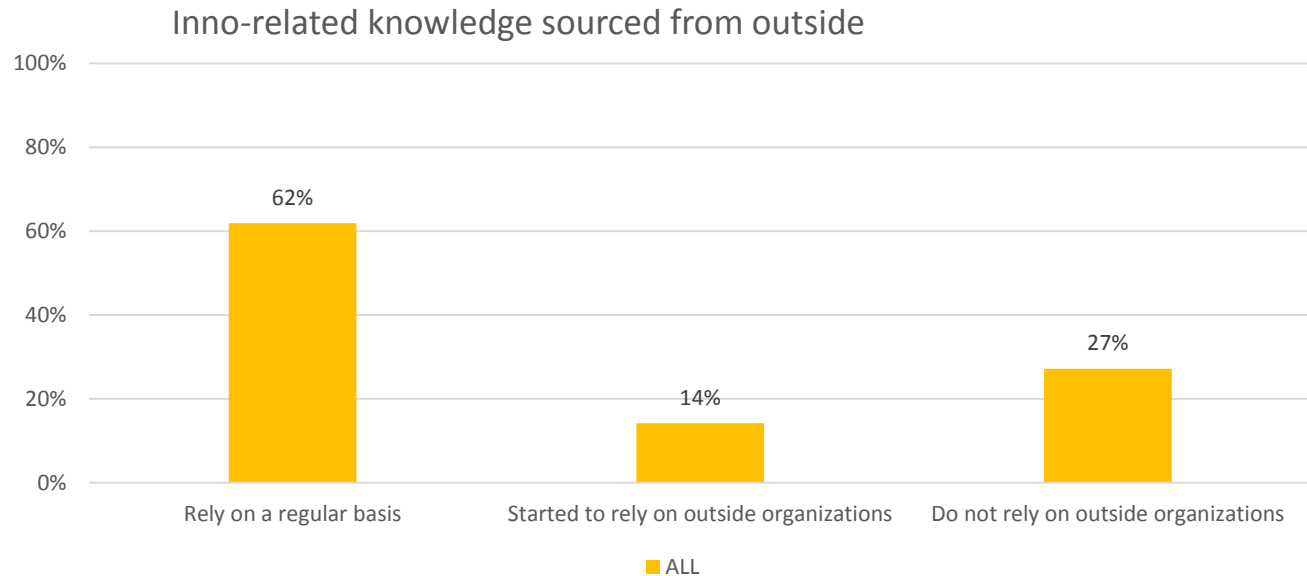


Innovation Ecosystem Stakeholders

Total n=694



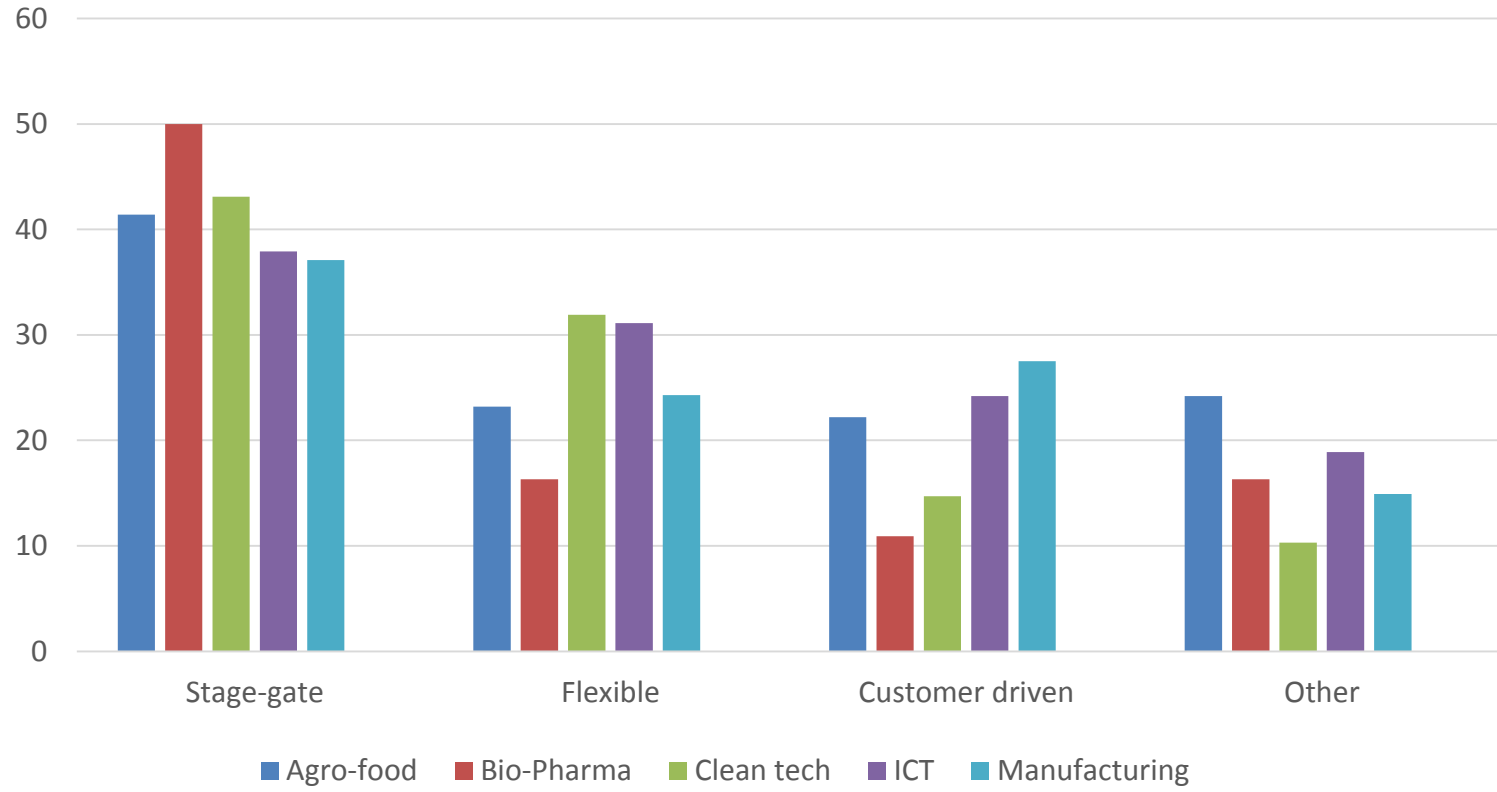
IES interactions: OI-activities



- All, N = 566
- 76 % of the companies indicated that they engage in OI-activities.

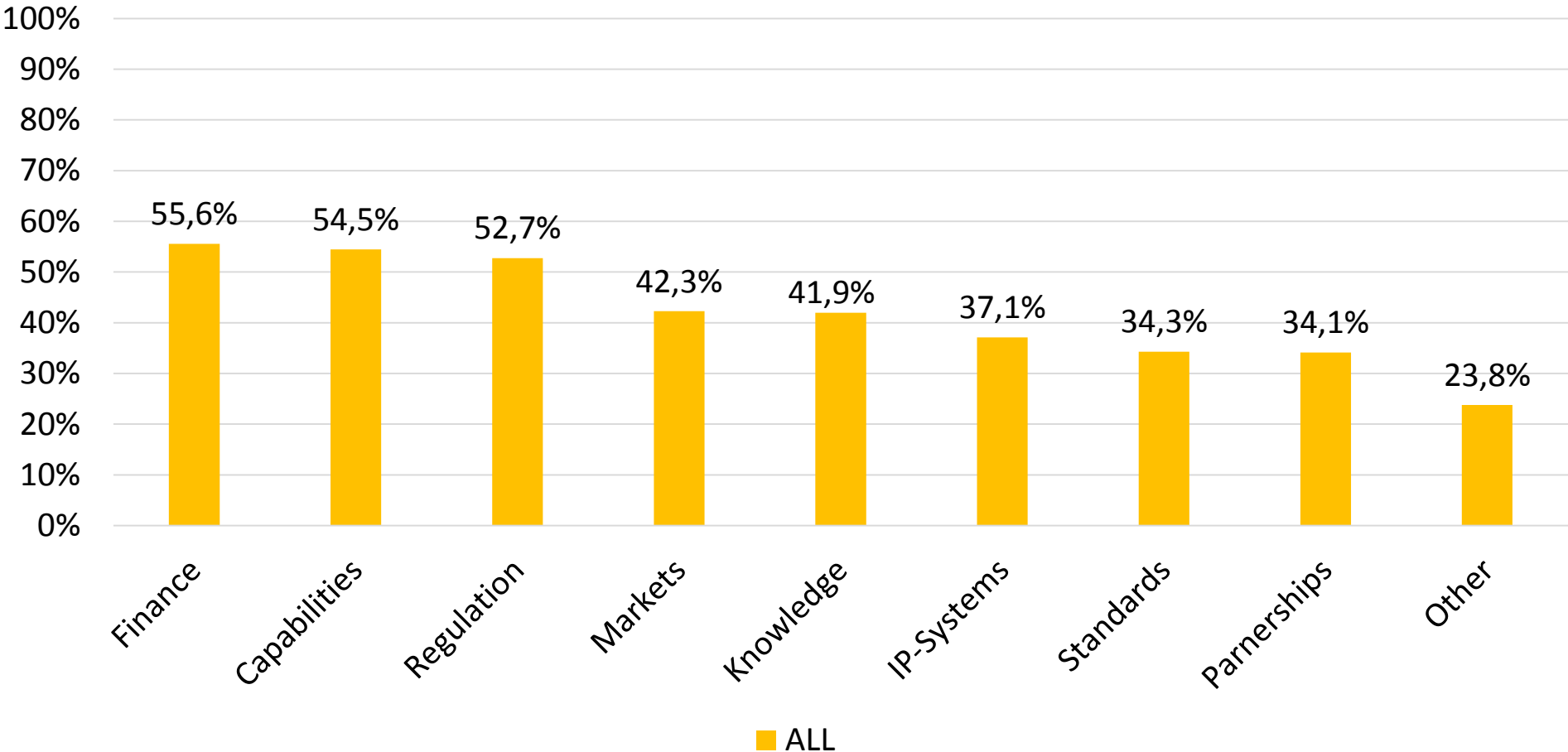


Innovation management and practice



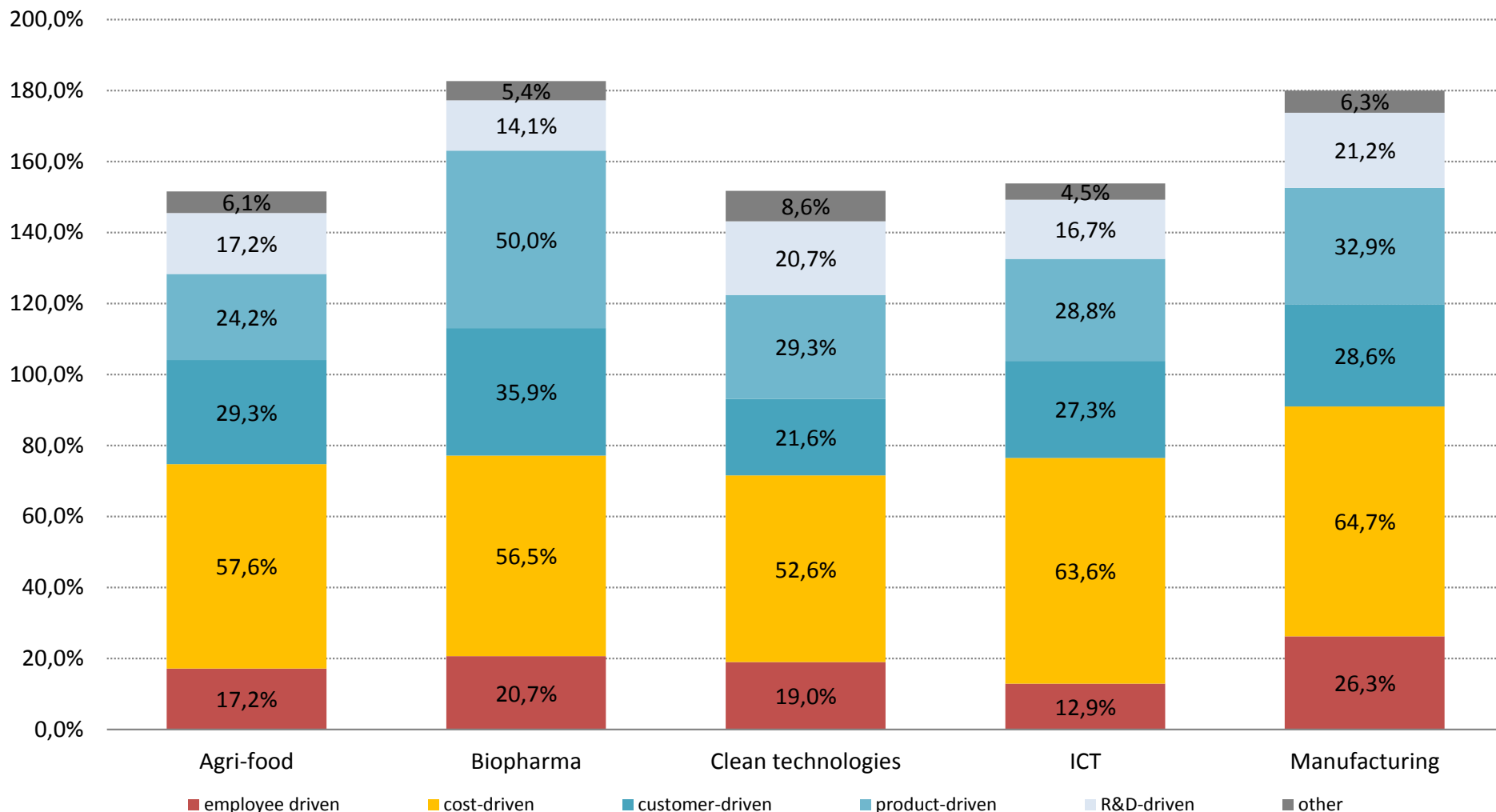
- **State-gate model dominates**
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Barriers to innovation

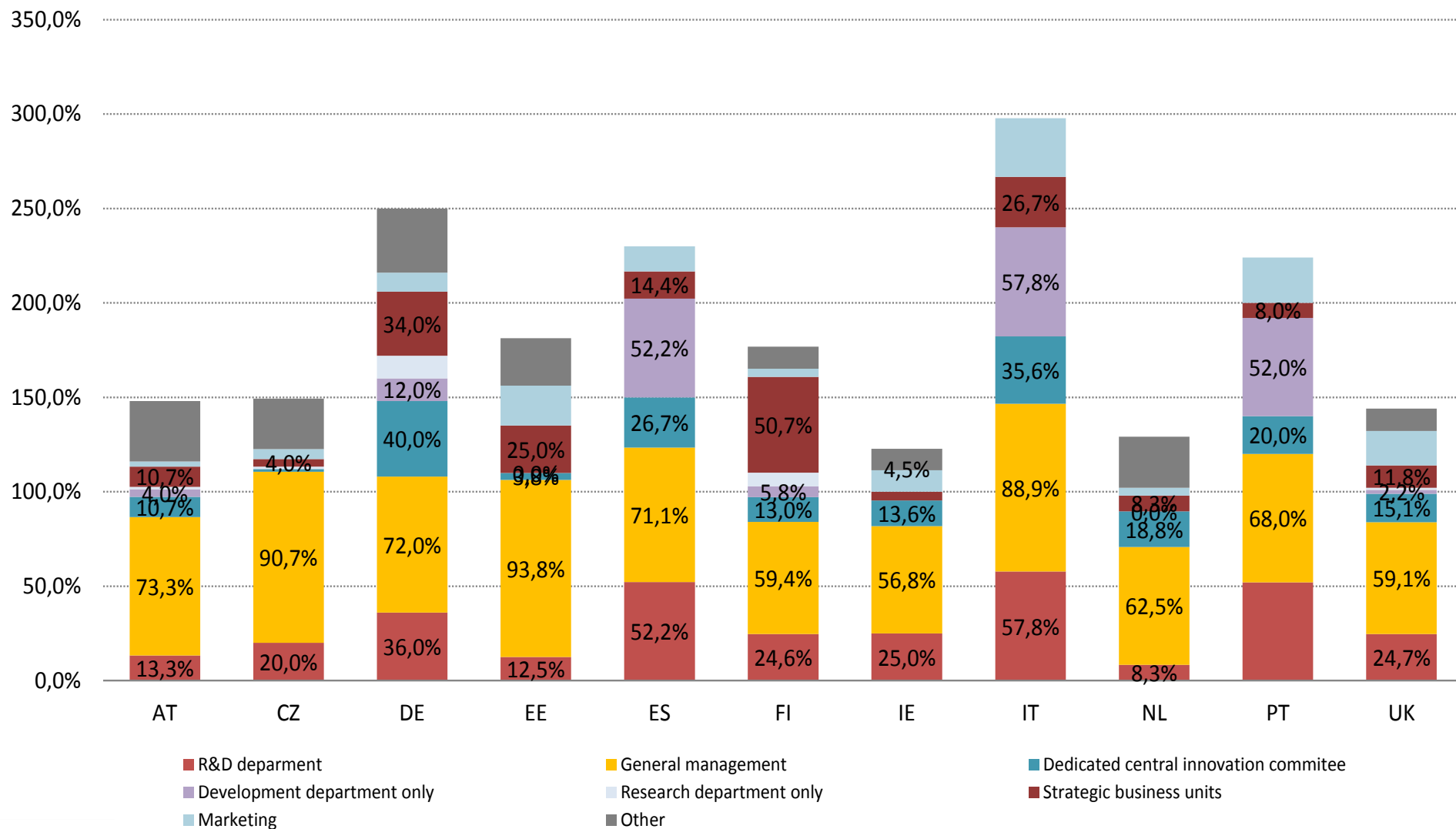


Includes only “yes”-answers, multiple choices were allowed.

Main Factors at the start of an innovation project



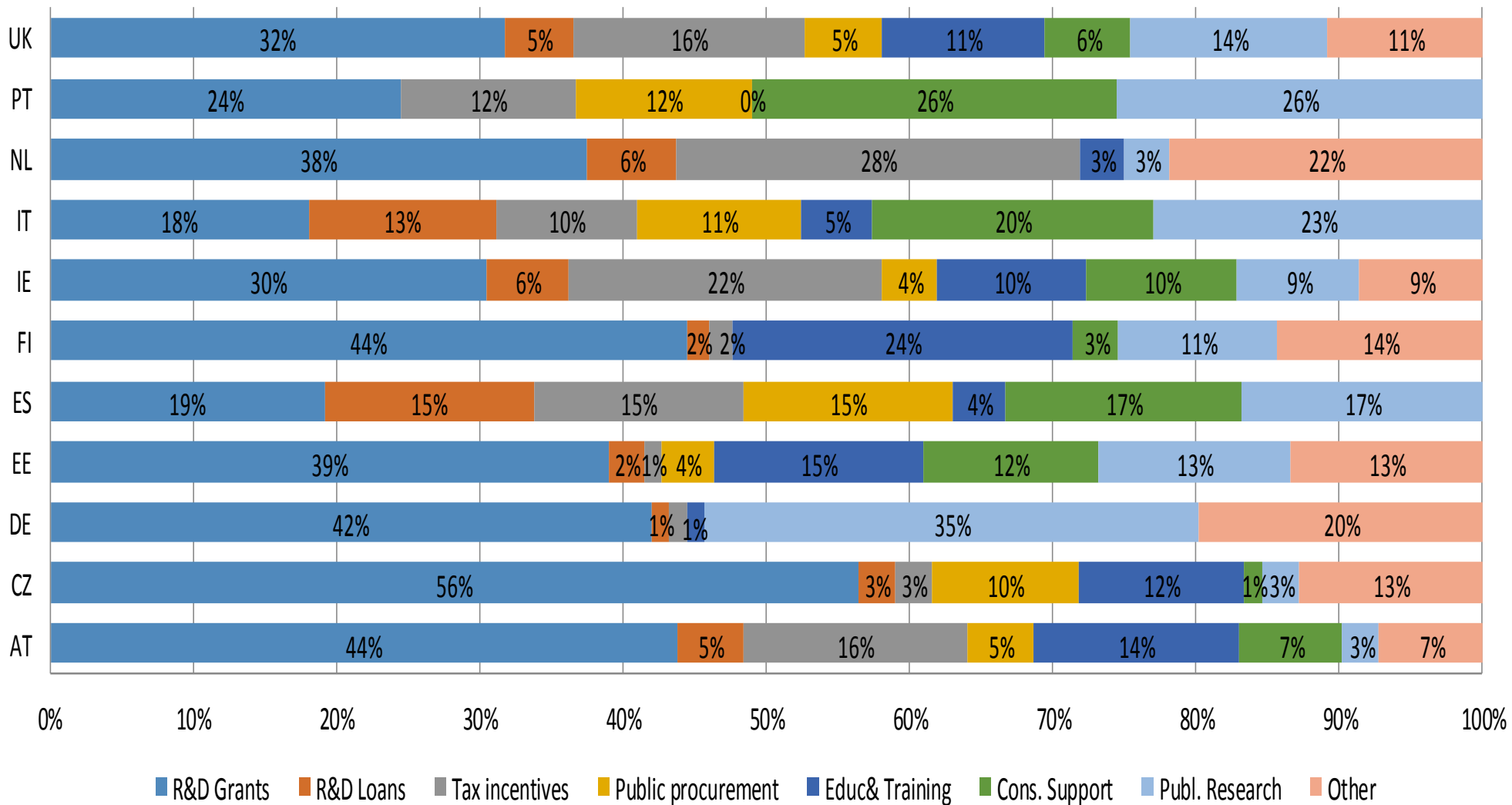
Main decision making actors



Most frequently mentioned policy gaps

- Insufficiently skilled people and development of talent/capabilities
- Systemic bias/difficulties for small firms
- Regulation around innovation (seen both as barrier and positive factor)
- Need for more demonstrators, pre-commercial procurement, procurement of innovation
- Insufficient grant funding available
- Insufficient seed, venture and growth funding
- Global trade difficulties
- Difficulties in knowledge transfer from research sector
- Bureaucracy and complexity in policy support
- Lack of coordination and consistency over time in policy environment

MOST IMPORTANT PUBLIC POLICY INITIATIVES



Addressing barriers and policy deficits – a systematic overview

Ecosystem		Barriers	Policy challenge	Policy measures
Flow	People	Lack of capabilities or skills	Skills deficits	<ul style="list-style-type: none"> • Training and advice in capabilities • Encourage recruitment of skills • Reduction of mobility barriers
	Finance	Access	Insufficient access	<ul style="list-style-type: none"> • Grants, loans and fiscal incentives • Mobilise private finance (co-investment, risk-sharing , facilitate venture capital
			Conditions and priorities of public funding	<ul style="list-style-type: none"> • Simplification (processes) • Foresight on priorities/strategy • Timeliness (evolution of ecosystems) Coherence and consistency
	Knowledge	Access	Partnership issues	<ul style="list-style-type: none"> • Promotion of science-industry links • Diffusion measures
			IP system	<ul style="list-style-type: none"> • Patent box
	Services	Exchanges enable innovation	Reliance on external knowledge for innovation	<ul style="list-style-type: none"> • Support RTOs, standards bodies, measurement and testing services, access to consultancy and professional services.
				<ul style="list-style-type: none"> • Digitalisation and adoption of ICT within business and innovation planning and implementation.

Addressing barriers and policy deficits – a systematic overview

Ecosystem		Barriers	Policy challenge	Policy measures
Systemic considerations	Regulation and Standards	Reg'tion	<ul style="list-style-type: none"> • Challenging frameworks (e.g. REACH) or clinical trials regulation and costs of compliance. • Lack of stability in regulation. • Varied compliance prevents level playing field. 	<ul style="list-style-type: none"> • Simplification • Proactive regulation • Embed regulators in ecosystems.
		Standards		<ul style="list-style-type: none"> • Standards projects
	Low demand for innovation	Access to markets	<ul style="list-style-type: none"> • Market barriers in the public sector • International trade issues 	<ul style="list-style-type: none"> • PPI • PCP • Supply chain measures
	Intermediary institutions		<ul style="list-style-type: none"> • [Lack of middle TRL R&D] • [Lack of technology infrastructure] • [Lack of capacity to assist firms] 	<ul style="list-style-type: none"> • Support RTOs, standards bodies, measurement and testing services, consultancy support, business support agencies

Addressing barriers and policy deficits – a systematic overview

Ecosystem		Barriers	Policy challenge / gap	• Policy measures
Systemic considerations	Populations of actors and entry/exit conditions		<ul style="list-style-type: none"> • [Deficiencies in anchor firms] • [Lack of entrepreneurship] 	<ul style="list-style-type: none"> • Promote technological inward investment • Support for scale-up firms • Support for start-ups • Student entrepreneurship education & support
	System transformation		<ul style="list-style-type: none"> • [Lock in] • [Coordination failure] 	<ul style="list-style-type: none"> • Challenge-based initiatives • New mission-oriented research