Horizon 2020 Policy Support Facility

POLICY RECOMMENDATIONS

EXCHANGE OF PRACTICE

ON-DEMAND SUPPORT

PEER LEARNING

Specific Support Action

The Latvian Research Funding System

Final presentation

Riga February 22

Background and Task

This study has been produced at the request of the Latvian authorities by an expert panel funded under the European Commission (DG RTD) Policy Support Facility.

It is **based upon**

- Document analysis
- Interviews conducted during two visits (March and June 2017)
- Inputs from and discussions with the Latvian authorities.

The **task** was to

- Review the funding systems and processes
- Propose an overall institutional/organisational structure

Team – Panel members

Independent Experts

- Dorothea Sturn (Chair)
- Erik Arnold (Rapporteur)
- Susana Borrás
- Jose Gines Mora Ruiz

- **National Peers**
- Indrek Reimand (Estonia)
- Philip Sinclair (UK)

Further involved

- Bea Mahieu (project management)
- Elina Griniece and Reda Nausedaite (background report)
- Diana Ivanova-van-Beers (contact point from DG Research and Innovation)

Five key policy messages

- 1) Funding for research and innovation, especially from national sources, needs to be boosted to drive performance and growth.

- 2) The structure and governance of state organisations should be streamlined to meet national needs.

- 3) Higher education governance should further be modernised.

- 4) Competitively-won research funding should increase in both scale and scope to meet national needs.

- 5) Investment in innovation by both the private and public sectors should be increased and broadened.

Road map …

- Research and innovation performance and policy
- Governance
- Research and innovation performers
- Research and innovation funding
- Recommendations and three proposals

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Research and innovation performance and policy

- Basic ideas
  - R&D is a crucial driver of economic development and growth – one of the best documented and robust relationships in the literature
  - 'National research and innovation systems' – an effective heuristic for analysing performance and setting policy
  - Balance among different policy objectives and instruments, in order to maintain coherent system performance

National (research and) innovation system
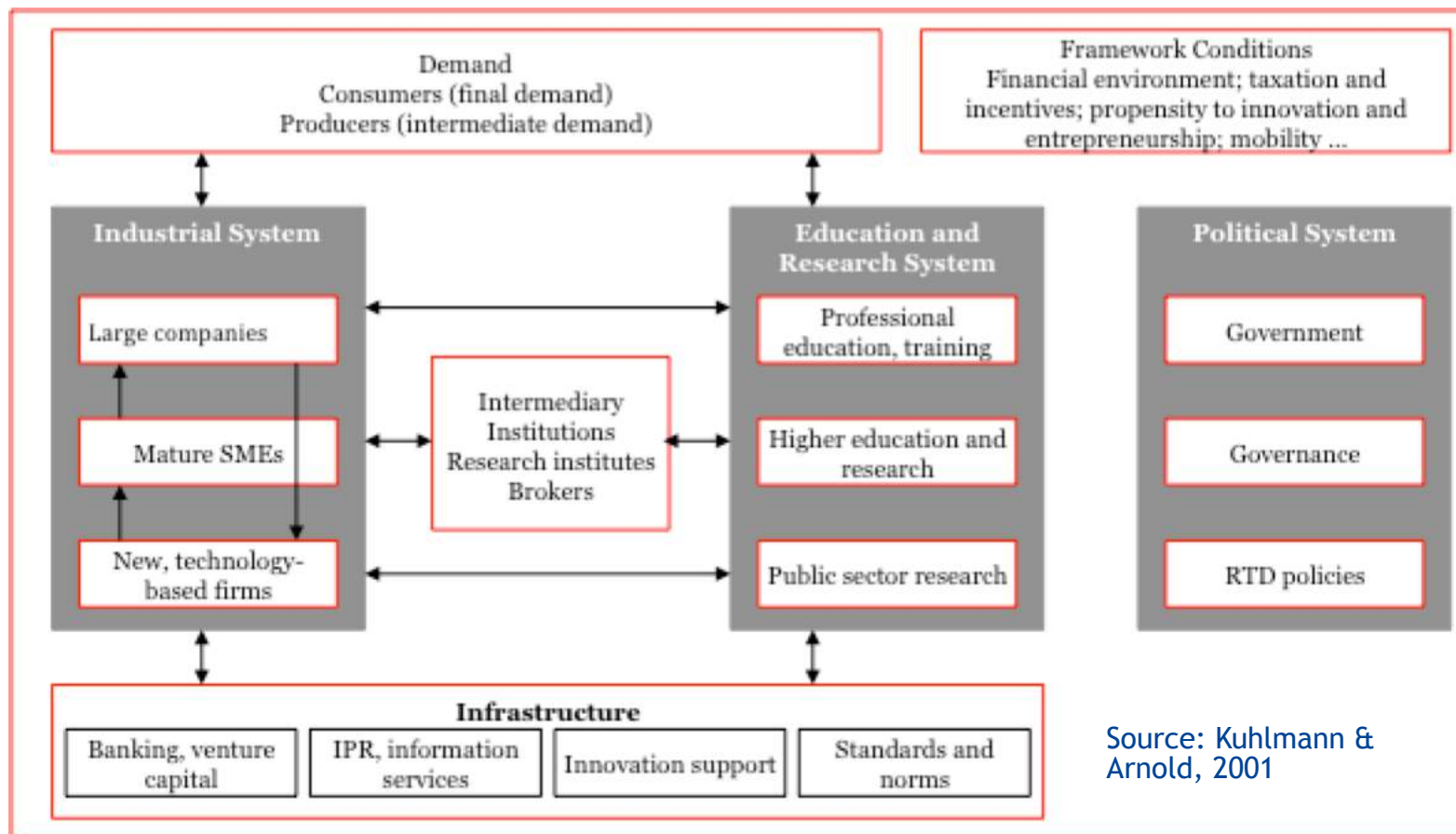
Source: Kuhlmann & Arnold, 2001

The NIS perspective has important implications for how we understand performance

- The bounded rationality of actors has important consequences
  - Knowledge, learning and institutions are key
  - Path dependence
- Institutions and their environments are inter-dependent – they co-evolve, so institutions are always context dependent
- In many cases, the relevant unit of analysis is not the individual but networks, clusters and institutions
- Governance and other mechanisms that create systemic cohesion are important
- Key systems issues are **balance** and the **policy mix** we use to achieve it
- Systems develop and change – there is no static 'ideal'

Three generations of 'failure' justifications for intervention

Market failure - often about basic research

- Indivisibility
- Inappropriability
- Uncertainty

Systems failure - mostly about inadequate performance

- Capability
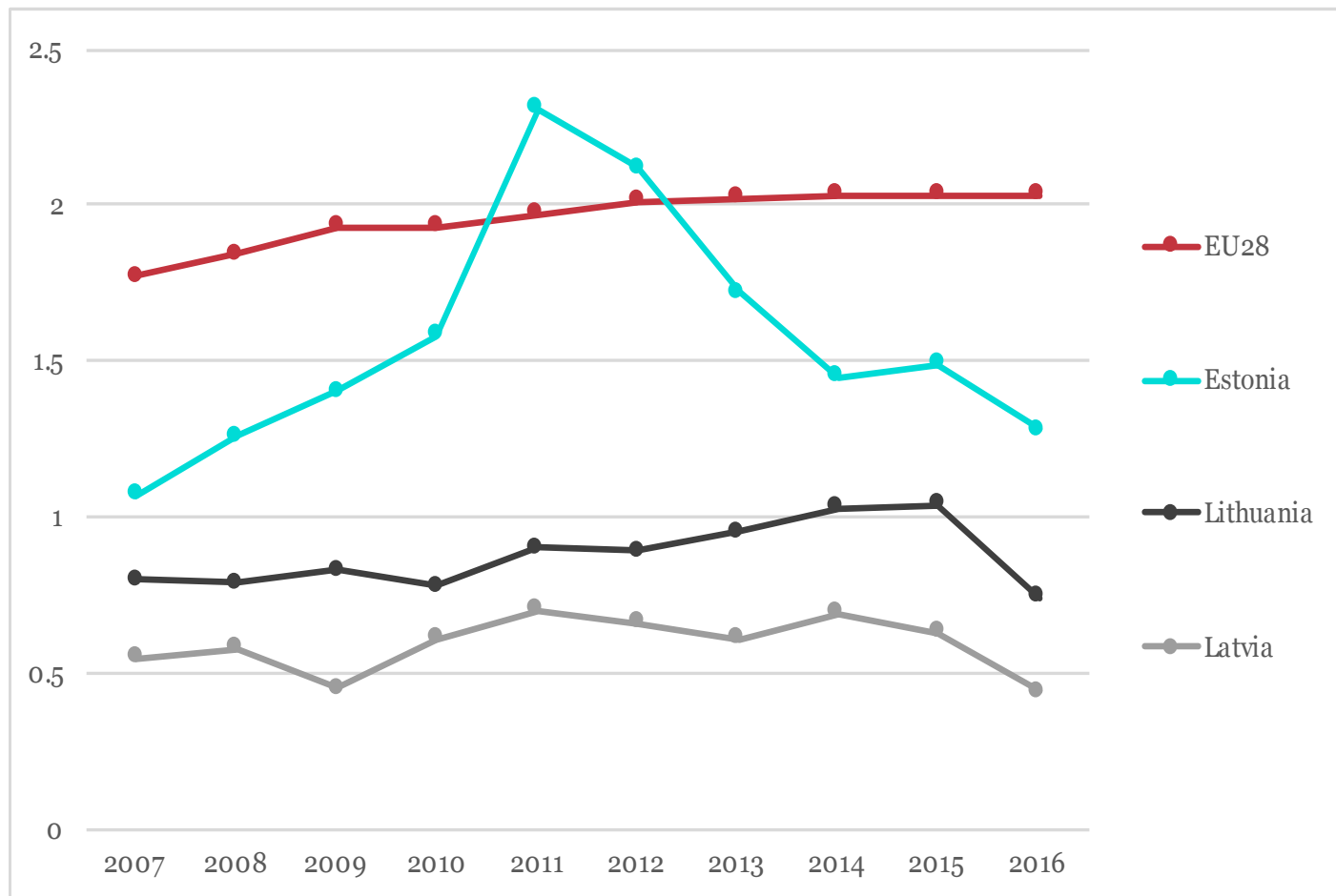- Institutional
- Network (including lock-in failures)
- Framework

Transition failure - mostly about inadequate performance

- Directionality
- Demand articulation
- Policy coordination
- Reflexivity

Nelson, 1959, Arrow, 1962

Smith, Arnold, many others …
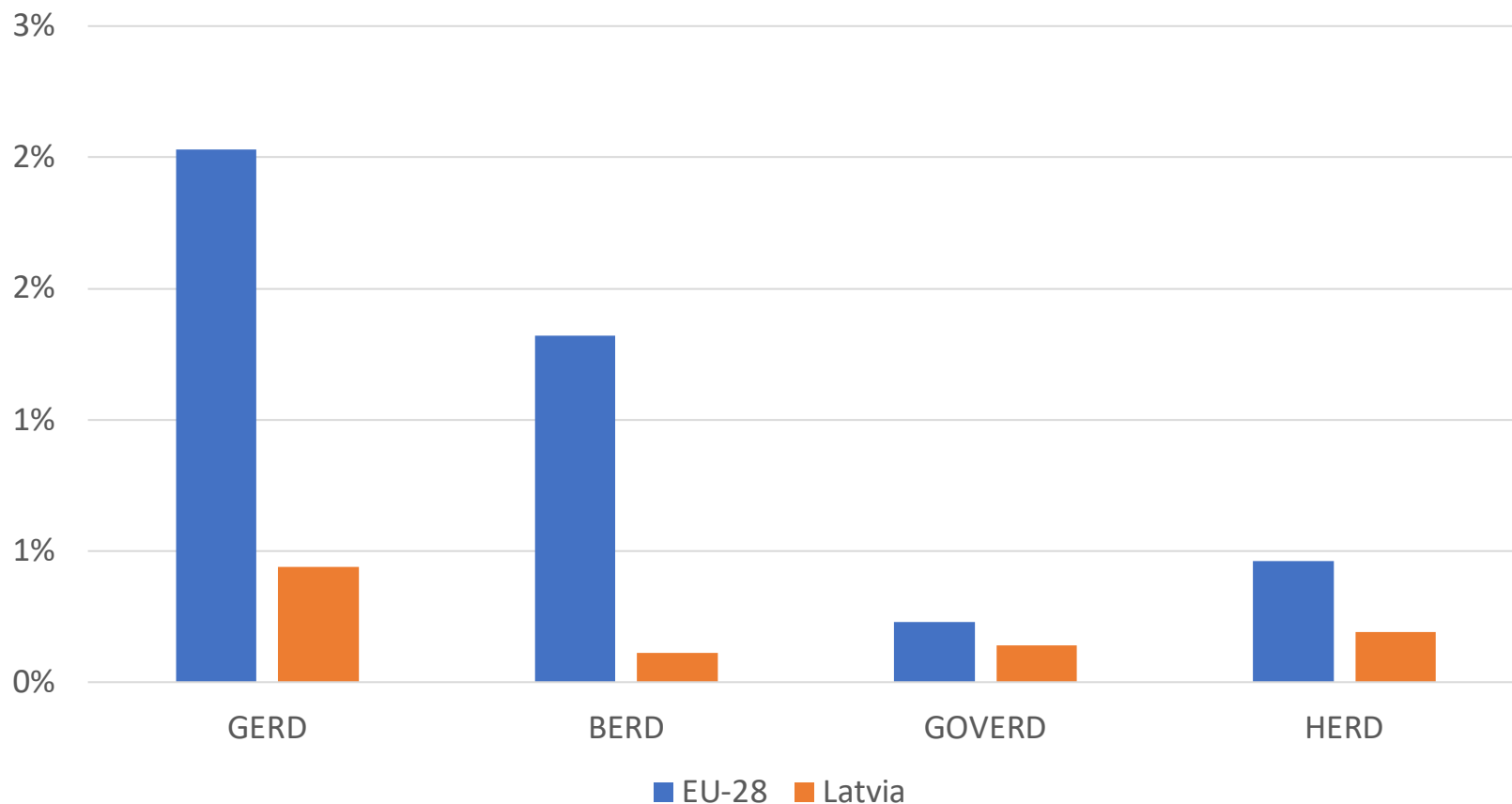
Weber & Rohracher, 2012

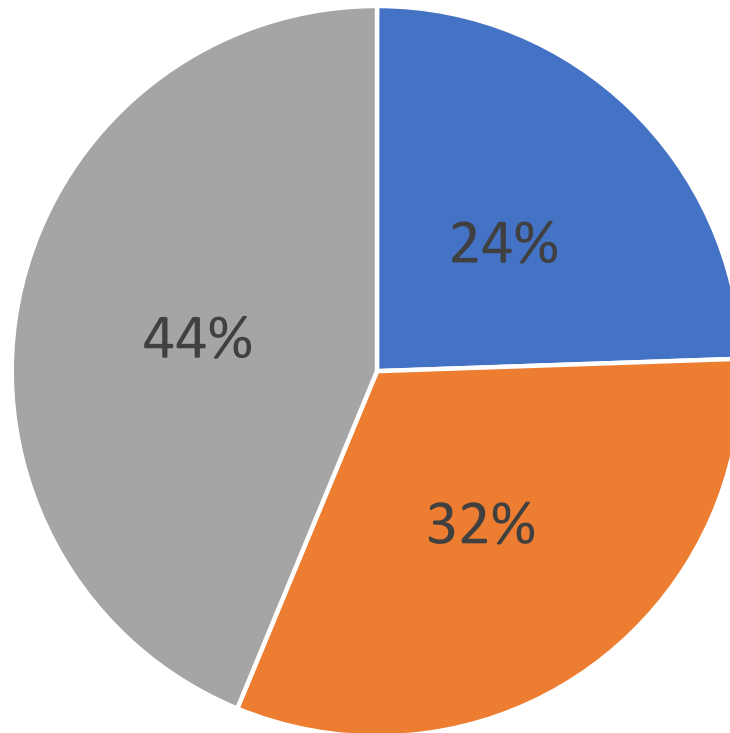# Latvia: low gross R&D expenditure as % of GDP, 2007-16

Source: Eurostat, 2017

All parts of R&D spending lag the EU as a percentage of GDP, 2016
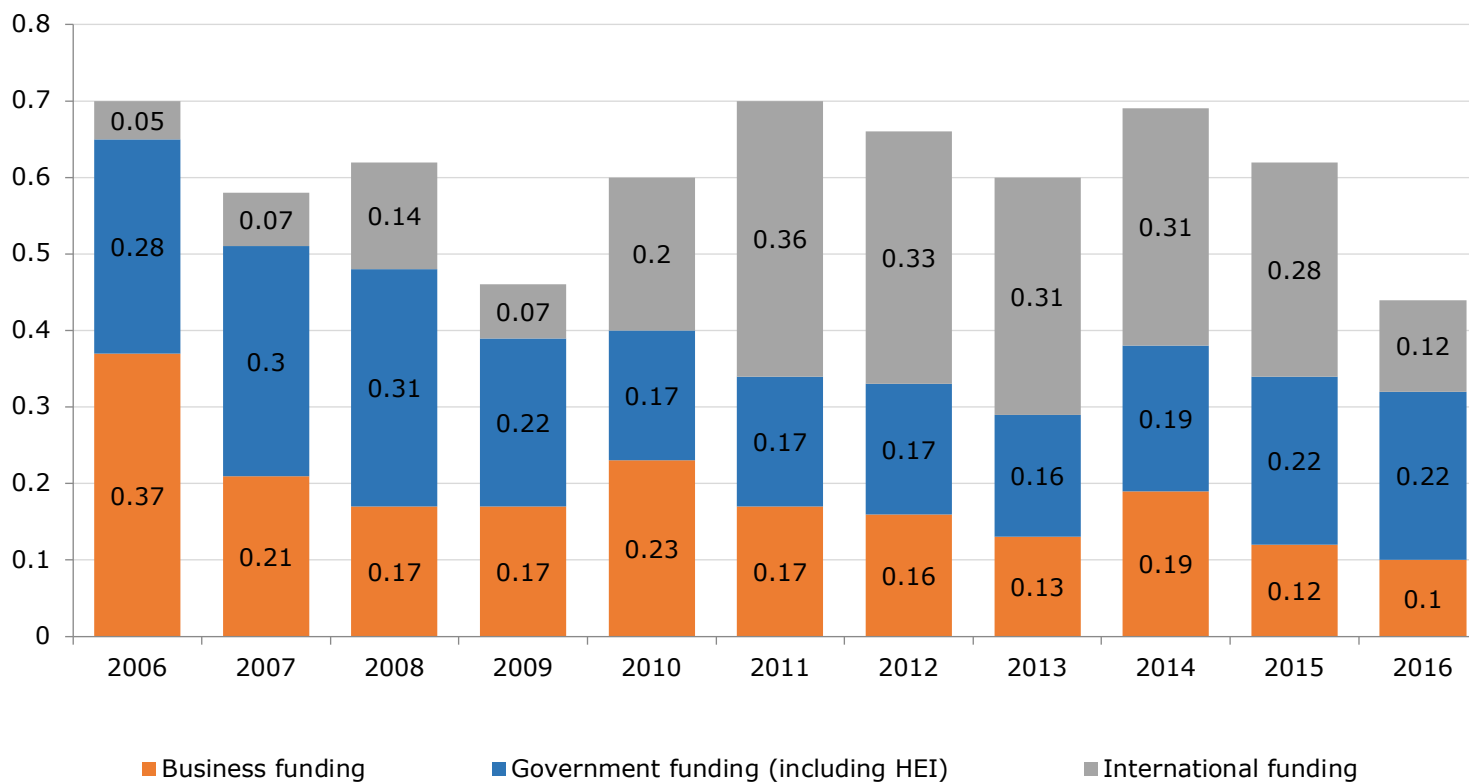
Composition of GERD 2016 – typical pattern of a developing country

24%
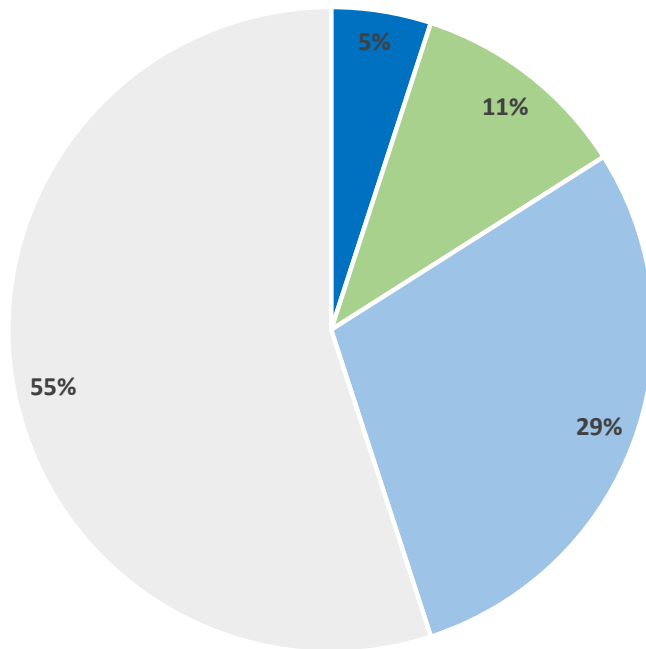
32%

44%

■ BERD ■ GOVERD ■ HERD

Structure of R&D funding, 2006-2016 (% of GDP)

Industry specialised in low-tech
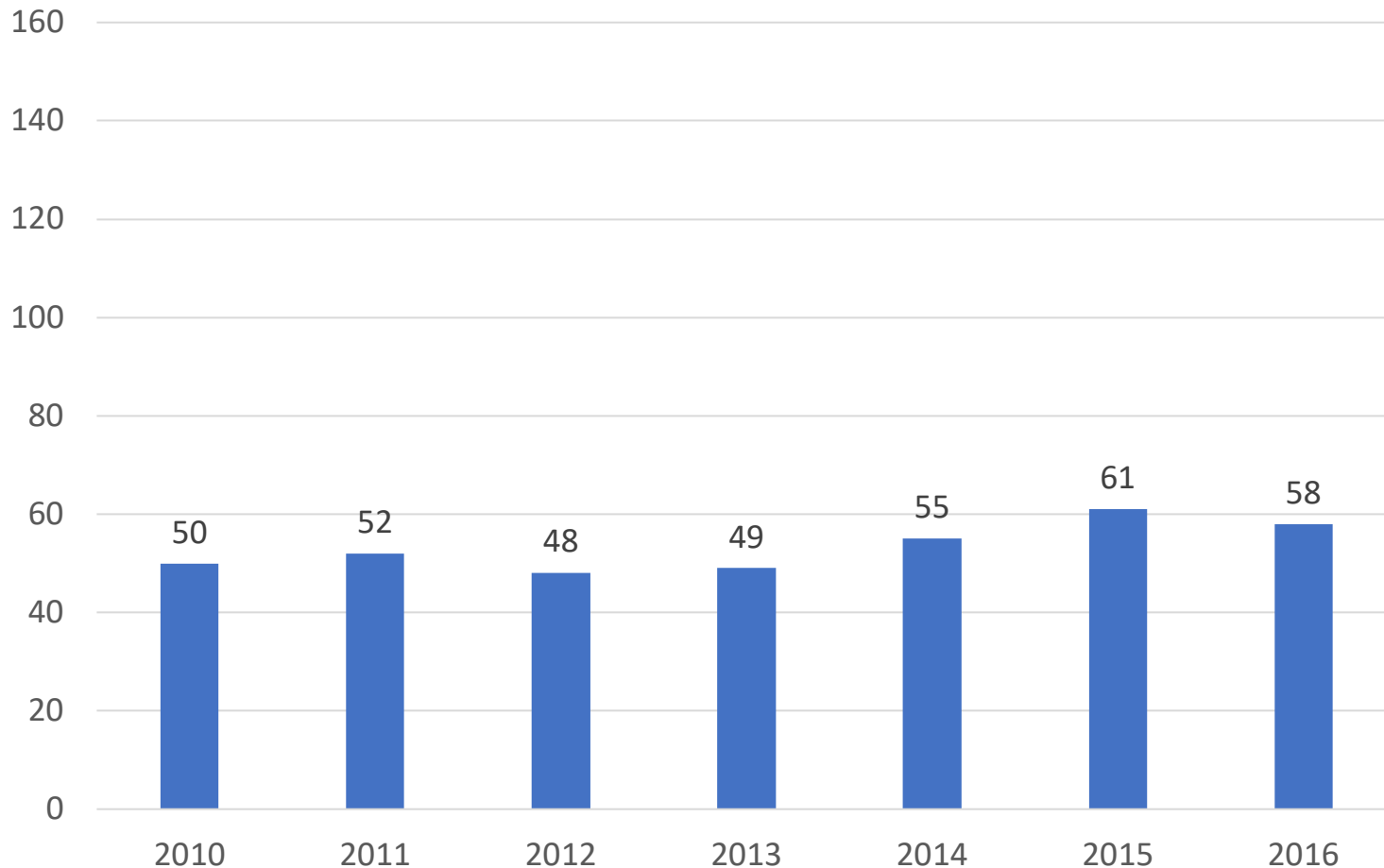

Latvia 2013   EU-27 2012

- High-technology industries
- Medium-high technology industries
- Medium-low technology industries
- Low-technology industries

Latvia in European Innovation Scoreboard relative to EU (100)

Source: EIS, 2017

Latvia in EIS 2016 relative to EU average

LINKAGES
MEs collaborating with others
Public-private co-publications
g of public R&D expenditures
INTELLECTUAL ASSETS
3.3.1 PCT patent applications
3.3.2 Trademark applications
3.3.3 Design applications
EMPLOYMENT IMPACTS
knowledge-intensive activities
ng firms of innovative sectors
SALES IMPACTS
n & high tech product exports
lge-intensive services exports
t and new-to-firm innovations

0   50   100   150   200   250   300

- The European Innovation Scoreboard listed Latvia in 2016 and 2017 as one of the EU's 'moderate innovators'.

- Production of graduates is strong but there are continuing problems of brain drain and population loss.

- **Qualification for migration?**
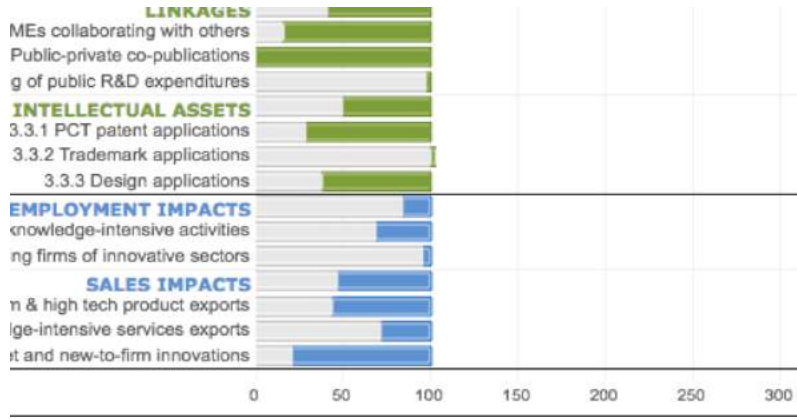
Source: EIS, 2017

Policy: development via export-led growth with FDI

- Guidelines for science, technology and innovation as well as for industry.
  - In line with the National Development Plan and the Smart Specialisation Strategy
- Coherent framework for the development of the country
- Many recent reforms, eg
  - Structural reform of the research sector, 2014-5, aiming to reduce the fragmentation of the state's research-performing system
  - Reform of the public funding for higher education (also in 2014-5), setting up a 'three-pillar' system
- Two more reforms currently in the implementation phase.
  - Modernisation of infrastructure, strengthening of institutional capacity and development of institutional strategies
  - Introduction of specific mechanisms to change the behaviour of research institutes and industry organisations

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Generic research and innovation governance

Source: Arnold, Bell, Bessant, & Brimble, 2000
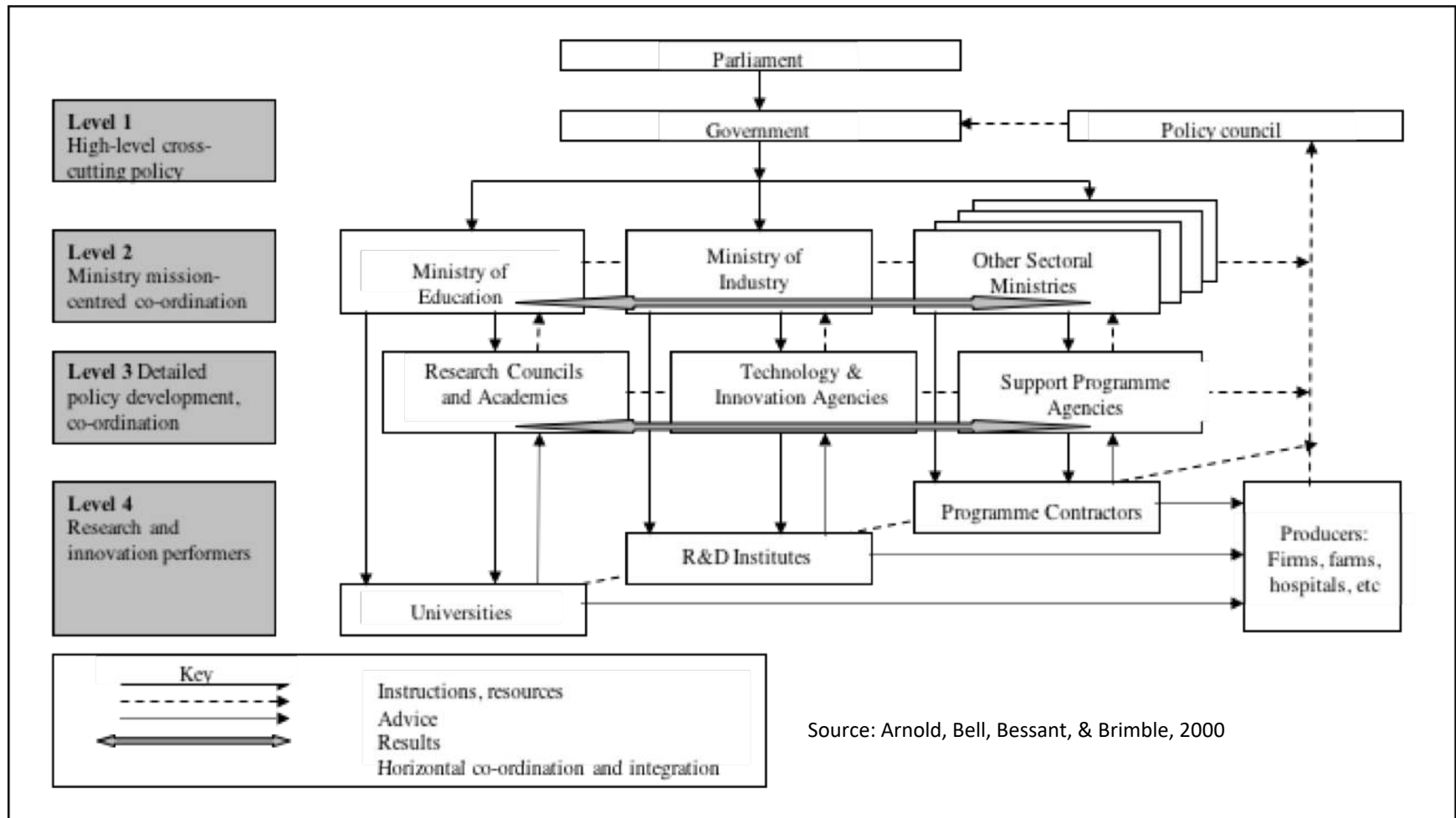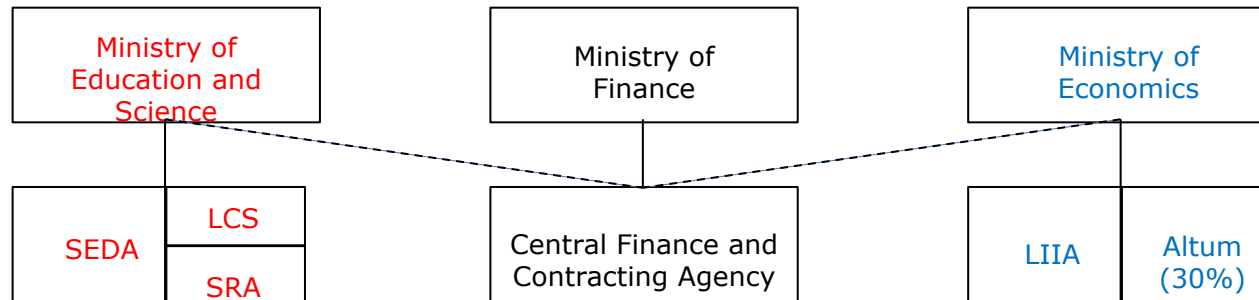
Why do we use agencies?

- Separates funding from the political level, reducing opportunities for political intervention at the micro level

- Supports the 'sector principle'

- Separates policymaking from implementation

- Builds scale and professionalism in implementation

Governance of the Latvian R&I system
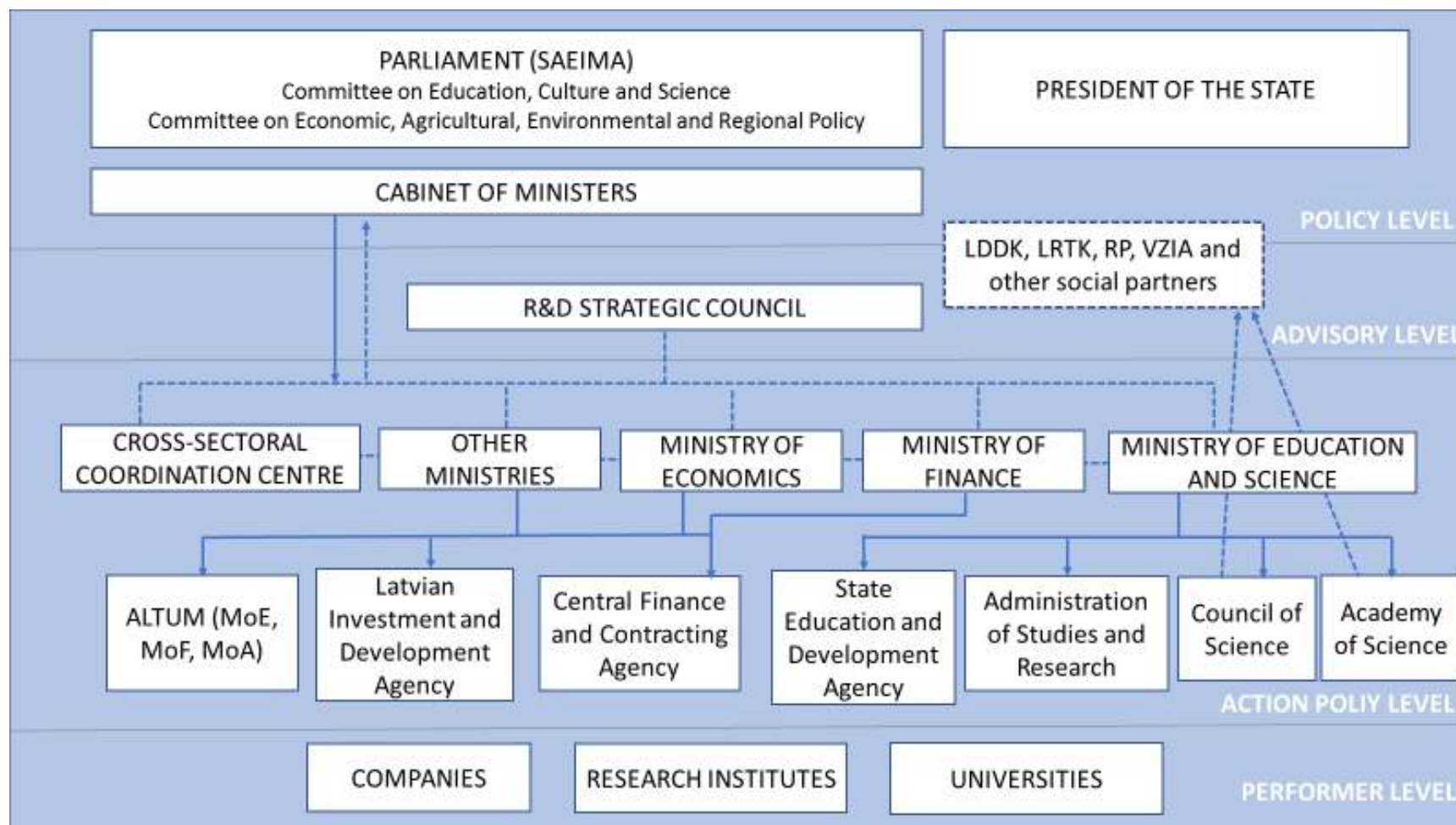
Sector lines of responsibility are disrupted

Ministry of Education and Science	Ministry of Finance	Ministry of Economics

| SEDA | LCS / SRA | Central Finance and Contracting Agency | LIIA | Altum (30%) |

- Institutional funding for research
- State Research Programmes
- Fundamental and applied research grants
- Grants for postdoctoral research

- Practically orientated research grants
- Strengthening the institutional capacity of scientific institutions
- Support for international cooperation in S&T
- Competence centres
- Support to implementation of new products into production
- Support for employee training
- Clusters

- Technology-transfer system including Innovation vouchers
- Innovation motivation programme
- Business Incubators

Governance

- System of agencies is fragmented
  - Critical mass of capacity, quality and scale?
- Budget restrictions
  - Few ministries beyond the MoES and MoE develop and fund their own research strategies.
- Coordination across government is limited

Agencies

- The Latvian Council of Sciences (LCS)
  - Performs peer review
  - Not appropriate staffed
  - Not fully independent of the Latvian Academy of Sciences.

- The Investment and Development Agency of Latvia (LIIA)
  - Has established a 'technology transfer' group
  - Functions as a small (sub-scale) innovation agency.

- Roles and functions of different agencies in implementation, monitoring, project selection etc. are overlapping, unclear and complicated

Governance: implications

- Reduce the number of organisations involved in research and innovation funding

- Allow to develop capacities that are lacking or in small supply

- Stop separating nationally resourced and structural funds-based policies and instruments

- Tasks should not be fragmented across two or more agencies

- Peer review should be centralised into a single competent organisation

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How do you influence the quality and direction of research?
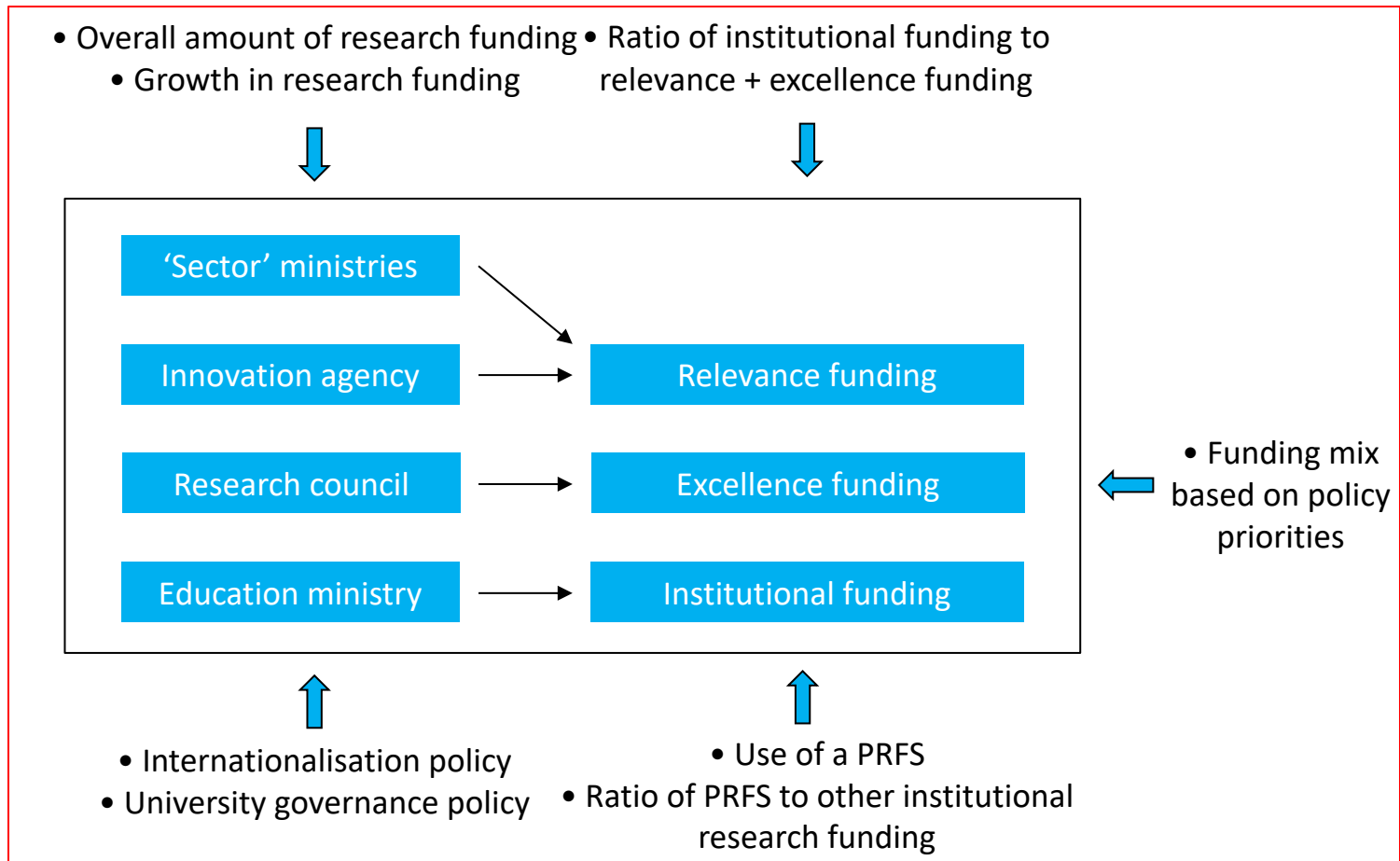
Research and innovation performers

- Most research takes place in higher education institutions and research institutes.
- Funding levels are low
  - Well below those in other developed countries
  - Unhealthy dependence upon structural funds
- Fragmentation is still high
  - Despite significant reductions in recent years

Universities

- Universities' governance is largely collegial, limiting their ability to act strategically
    - Too few people doing research
    - Overall quality needs to improve despite areas of strength
- Funding incentives have been introduced to address these problems
- Age structure
    - High proportion of the research workforce is coming up to retirement
    - New generation of young researchers but few people in the middle age-groups.
- Research careers are insecure and poorly structured.

Firms

- BERD was only 0.10% of GDP in 2016, compared with an EU average of 1.3%.
- Latvian firms tend to be smaller than the European average
  - 6% are foreign-owned, compared with 1% in the EU
- FDI is not concentrated in R&D intensive fields
- Some 30% of GDP is produced by state-owned firms
  - most of which also do little R&D
- More firms becoming more competitive via internationalisation and innovation
  - But these also do little R&D
- Riga has a small technology start-up community but not yet a well-developed ecosystem

How do research-innovation links normally work at the micro level?

- Increase in the stock of useful knowledge
- Supply of skilled graduates and researchers
- New instrumentation and methodologies
- Creation of networks and stimulation of social interaction
- Enhancement of problem-solving capability
- 'Spin-off' companies
- Provision of social knowledge

Ben Martin and Puay Tang, The Benefits from Publicly Funded Research, SPRU, 2007

A need to build absorptive capacity

Company Types

|	
Research Performers	• Research department or equivalent • Able to take long run view of technological capabilities
Technological Competents	• Multiple engineers • Some budgetary discretion • Able to participate in technology networks
Minimum-Capability Companies'	• One engineer • Able to adopt/adapt packaged solutions • May need implementation help
Low-Technology SMEs	• No meaningful technological capability • No perceived need for this • May be no actual need

Research-industry links in Latvia

- Links are relatively few
    - The industrial side is technologically weak
    - Companies lack significant technical staff that could undertake R&D
- Competence centres programme is seen as providing a large and positive contribution to such links
- Limited entrepreneurial culture within the universities
    - Except at Riga Technical University (RTU)
    - A small number of institutes work very actively with industry, abroad as well as at home
- Few 'boundary organisations'
    - RTOs like Fraunhofer are missing
    - RTU, the competence centres, some others provide some of the corresponding functions

'Boundary Organisation' – VTT's Innovation Model
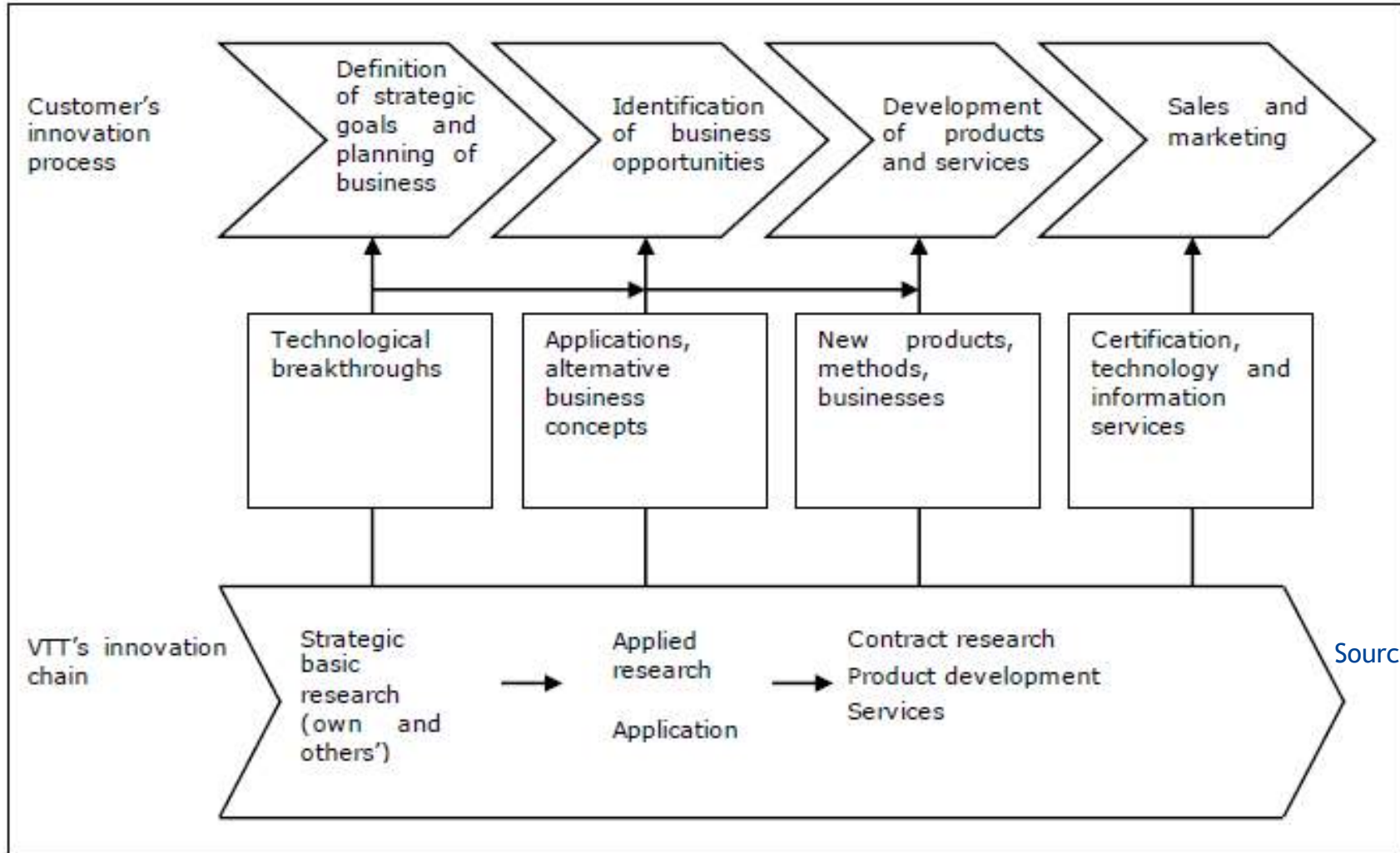
Source: VTT

Implications: Higher Education

Higher education structure and governance should further be modernised

- Consolidate the research-performing organisations further

- Run universities using boards with a majority of external, societal representatives and the power to appoint the rector

- Reform the research career system

- Connect the national higher education accreditation agency with the main European networks

Implications: Firms and absorptive capacity

Increase and broaden innovation investment by private and public businesses

- Introduce further measures to foster innovation and create absorptive capacity in firms

- The state-owned firms represent a significant lever over the performance of industrial R&D. Required them to spend a certain minimum of their revenues on doing or commissioning R&D

- Investigate the opportunities to strengthen the 'boundary' function

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Research and innovation funding

- Total annual public funding for research
  - €73m in 2017
  - Half came from structural funds.
- Most national money was devoted to institutional funding
  - Leaving little for competitive, project-based programmes.
- Growing portfolio of research funding instruments (ESIF funded)
  - Building research capacity
  - Supporting young researchers

Performance based funding

- Following the research assessment exercise of 2014, the government has decided to make some of research-performing organisations' institutional funding dependent on past performance
- This is being done as part of implementing a 'three-pillar' funding model
  - Institutional funding for higher education and research and competitive project funding for research
  - Funding dependent upon past performance in higher education and research
  - Funding to promote institutional development and innovation – which has largely yet to be implemented

Outline of the new HEI funding model

	pillar 1: basic funding	pillar 2: performance – oriented funding	pillar 3: innovation – oriented funding
teaching	• numbers of study places (per field) • cost oriented weight	• Alignment of HE and R & D • Rewards past perfomance	profile-oriented target agreements teaching + research + third mission
research	• numbers of research staff (per field) • cost-oriented weight	• **Research staff FTE (MAs, PhDs)** • **Industry funded research;** • **International research.**	funding of centers of excellence

Source: Ministry of Education and Science

Innovation funding and internationalisation

- Internationalisation of research is promoted through a number of bi- and multi-lateral arrangements, including the Framework Programme.

- Innovation funding programmes for industry amount to some €40m in 2017
    - Entirely paid for by structural funds and including the competence centres, technology transfer, innovation vouchers, innovation promotion and a range of investment and training incentives
    - The portfolio is ambitious but has some missing elements and is inherently unstable, owing to the dependence on structural funds.

Implications

Competitively-won research funding should increase, in order to meet national needs

- The next research assessment exercise
  - Should be directly coupled to performance-based funding
  - Should continue to use peer review, in order to generate institution-specific feedback
- Both the scale and the scope of competitive, external research funding schemes should increase, in order to meet national needs for both 'bottom-up' and thematically orientated research

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Funding for R&I should increase, especially from national sources

- Increase state expenditure on research and innovation in order to drive performance and growth

- Improve communication to achieve a clearer national understanding and vision of R&I, and upgrade the visibility and priority of research and innovation policy

- The line ministries should allocate a certain share of their budget to research and innovation in their respective areas

- The current high dependence on structural funds is not sustainable in the longer term so Latvia should seek a better balance between national and European funding

Streamline structure and governance of state organisations

- Restructure and improve coordination and the division of labour

- Clearly separate policymaking in the ministries and implementation in agencies

- Re-integrate the implementation of structural funds programmes with national funding in order to build implementation capacity and scale

- Centralise peer review proposal assessment, building on existing experience and capabilities

- Develop a stronger and more integrated innovation agency function, with good links to research as well as business innovation

- Consider the role and function of the Latvian Academy of Science
  - Support its efforts to be a learned society and champion of science
  - Detach the Latvian Council of Sciences, which should form part of a unified implementation agency or, failing that, be governed by an independent board

- An incidental bugbear is the perceived complexity of procurement rules that impede project implementation. These should be clarified

Modernise higher education structure and governance further

- Consolidate the research-performing organisations further
  - Respecting individual circumstances and opportunities for some to act as 'boundary organisations'
- Run universities using boards that have a majority of external, societal representatives and the power to appoint the rector
- Reforming the research career system, for example by introducing a tenure track
- Connect the national higher education accreditation agency to the main European networks in its area, both to obtain recognition and in order to learn

Increase competitively-won research funding

- Link the next research assessment exercise to performance-based funding
  - Care should be taken to ensure that this does not accidentally undermine the incentives for other vital functions such as teaching and the third mission

- Continue to use peer review next time, to generate institution-specific feedback

- Increase the scale and scope of competitive, external research funding schemes to meet national needs for both 'bottom-up' and thematically orientated research

Increase and broaden innovation investment by business

- The innovation funding portfolio is incomplete
  - Strengthen it with additional measures that foster innovation and create absorptive capacity in firms
- The state-owned firms represent a significant lever over the performance of industrial R&D
  - Require them to spend a certain minimum of their revenues on doing or commissioning R&D
- This study was not able to go into the detail needed to make specific recommendations about creating or strengthening 'boundary organisations between research and industry
  - Investigate further the opportunities to strengthen the 'boundary' function

Option 1: A unitary implementation agency
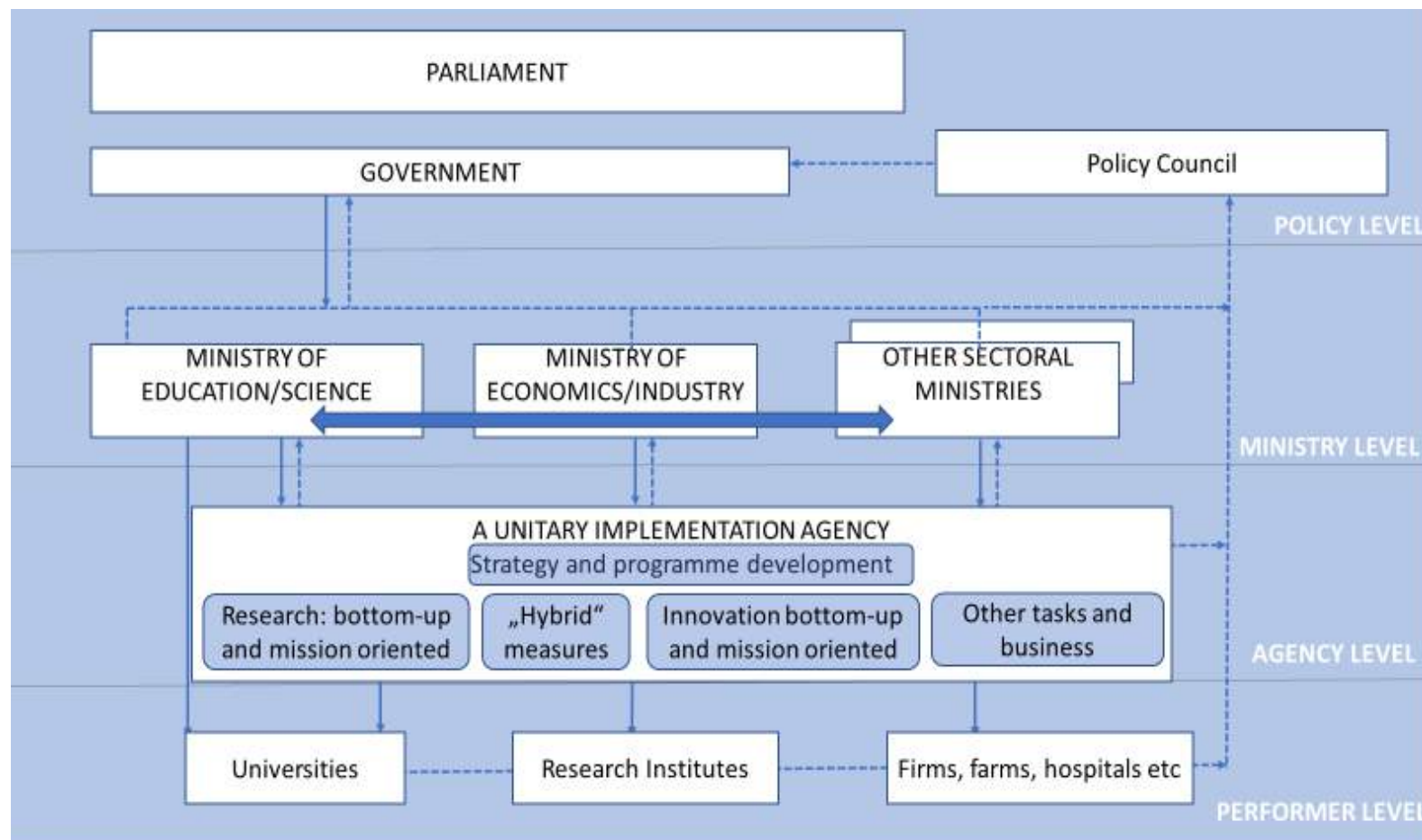
Option 2: A ´two-pillar´ structure
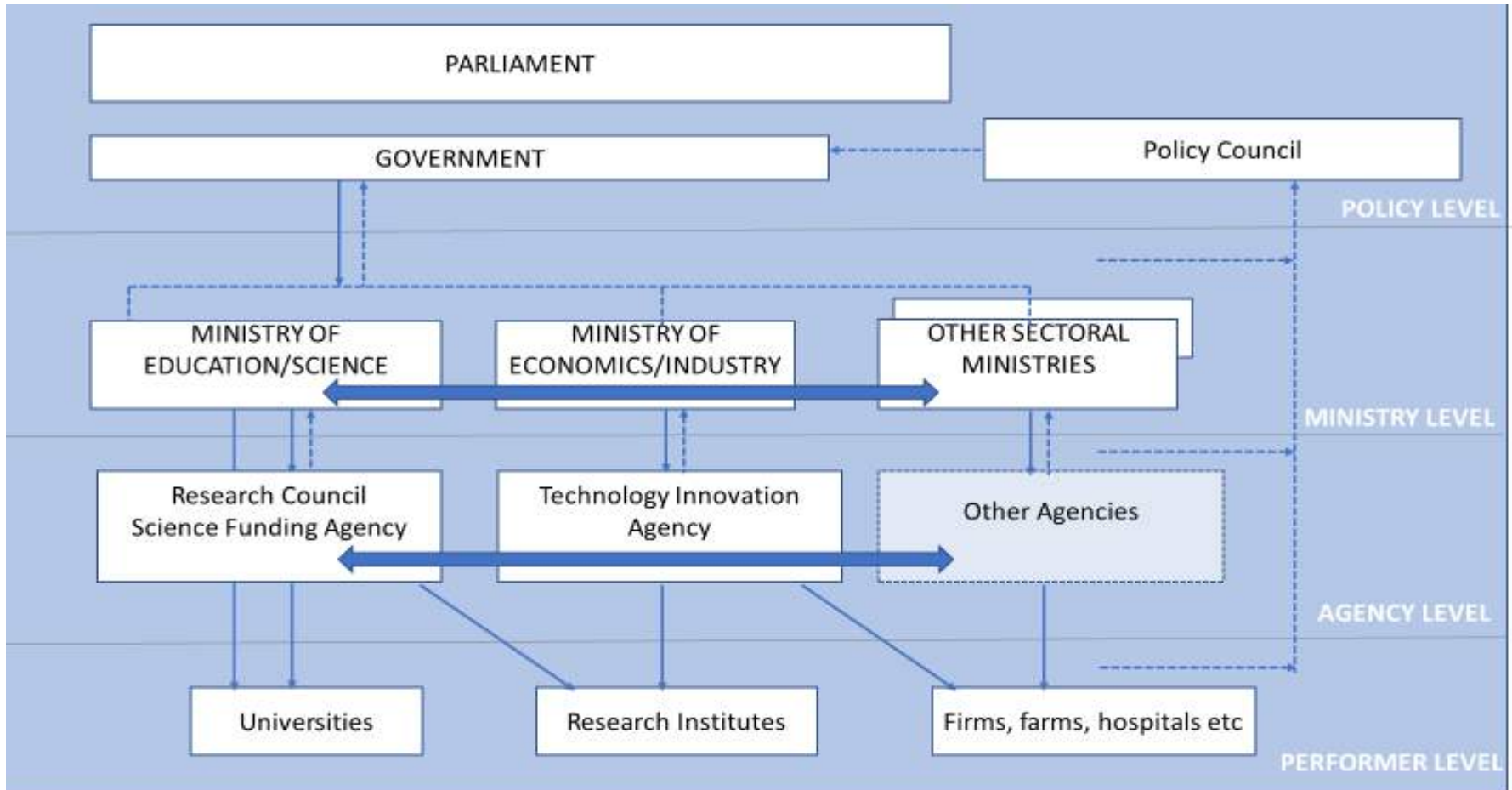
Existing tasks in research and innovation funding

Organisation	Programming	Research Project Selection	Innovation Project Selection	Monitoring and funding administration
MoES	√	√		√
MoE	√			
MoF	√			
LCS		√		
SEDA		√		√
SRA		√		√
LIIA			√	
CFCA		√	√	√

Proposed tasks in research and innovation funding

Organisation	Programming	Research Project Selection	Innovation Project Selection	Monitoring and funding administration
MoES	√			
MoE	√			
MoF	√			
Proposal 1				
Unitary implementation agency		√	√	√
Proposal 2				
Research agency		√		√
Innovation agency			√	√

PRFS in addressing research policy needs 1

Research Policy Needs	PRFS	Other Policies and Instruments
De-fragmentation among research institutions	*Encouraged by other PRFS incentives*	Merger incentives already in place
Reform HEI governance	*Encouraged by other PRFS incentives*	Specific reform policy needed
Increase number of HEI researchers	–	Additional funding needed
Raise research quality	*PRFS quality incentive*	Continue to provide external, competitive funding

PRFS in addressing research policy needs 2

Research Policy Needs	PRFS	Other Policies and Instruments
Improve HR management to tackle generational shift	*PFRS 'environment' incentive*	HEI reforms and programmes aimed at young researchers
Introduce better academic career structure	*PRFS 'environment' incentive*	Needs complementary tenure track policy
Increase research funding, especially institutional funding	–	Increase institutional funding, some of which should be driven by the PRFS
Improve research-industry links; focus more on 'third mission'	*PRFS 'impact' incentive*	Complementary programmes such as competence centres