

# EVOLUTION OF ROMANIA'S R&D AND INNOVATION SYSTEM

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## *SUMMARY*

- ✓ **The Dynamics of the Romania's RDI system**
- ✓ **Lessons learnt from the implementation of the RDI Strategy 2007-2013**
- ✓ **The RDI in support of economic competitiveness**
- ✓ **Paradigm shift for the 2014-2020 National RDI Strategy**

# The dynamics of the Romania's RDI system (I)

## 1. Constant number of RDI entities & researchers

~ 1300 organizations performing RD&I activities:

- 266 public R&D organizations
- About 1000 private companies performing R&D



## The dynamics of the Romania's RDI system (II)

### 2. System fragmentation

- ❑ Strategy document for the RDI domain in the post-EU accession period 2007-2013:
  - *The National RDI Strategy for 2007-2013*
    - approved by Government Decision no. 217/ 2007
- ❑ The main instrument for implementing the National Strategy
  - *The National RDI Plan for 2007-2013*, also called **National Plan II – NP II (PN II)**
    - approved by Government Decision no. 475/ 2007
    - coordinated by **ANCS**
- ❑ Instruments complementary to NP II:
  - *SOP-IEC / Axis 2 - Competitiveness through research and innovation*
    - Managing Authority- **MECMA**, Implementation Intermediate Body - ANCS
  - *6 sectorial R&D plans*
    - coordinated by ministries: **MECMA, MADR, MCSI, MDTR, MAI, MAPN**
  - *The priority research programmes coordinated by the Romanian Academy*
  - *49 core R&D programmes* of the National R&D Institutes
    - coordinated by ANCS

## The dynamics of the Romania's RDI system (III)

### 3. Discontinuity

- **Funds,**
  - Cuts back of the projects budget: 2008, 2009,2010
- **Legislation**
  - Rules of participation changed: 2011,2012
- **Financing system**
  - Eligibility criteria, instruments, evaluation criteria: 2010,2011,2012
- **Governance**
  - Implementing agencies merged, New roles for the Advisory Bodies and new membership: 2010,2011,2012
  - The National Council for Science and Technology Policy (CNPST) – not yet functional

## The dynamics of the Romania's RDI system (IV)

### 4. Consolidation of RDI system (# of publications, research infrastructures, # of researchers –constant, international collaboration)

*Human resources:* support for scientific career development for more than 500 young researchers

- research projects supporting doctoral and post-doctoral studies
- formation of young research teams in frontier domains
- reintegration of researchers with stages abroad

*Infrastructures:*

- new/ up-graded R&D equipment/ facilities in more than 250 labs
- 26 projects for large scale R&D infrastructures (in correlation with corresponding pan-european facilities - ESFRI projects)

*Visibility:*

- the number of internationally quoted publications almost doubled between 2007 and 2011

## The dynamics of the Romania's RDI system (V)

### 4. Consolidation of RDI system (# of publication, research infrastructure, # of researchers –constant, international collaboration)

#### ***Increasing economic competitiveness***

Support for the development of R&D activities and infrastructures for more than 600 enterprises

Participation in five pan-european Joint Technology Initiatives (JTIs):

„Clean Sky” (aeronautics), ENIAC (nanotechnology), “Fuel Cells” (energy), ARTEMIS (embedded systems), IMI (health)

#### ***Cooperation in the international arena***

FP7: 708 participants in 575 projects (position 19 in total EU); total budget/ RO participants: 96 M€uro

Participation in 16 ERA Nets, 15 ESFRI projects

Recent membership to the European Space Agency – ESA

Accession to CERN

Development of bilateral S&T cooperation (15 active bilateral cooperation programs, with countries from/ outside Europe, including USA, China, Japan)

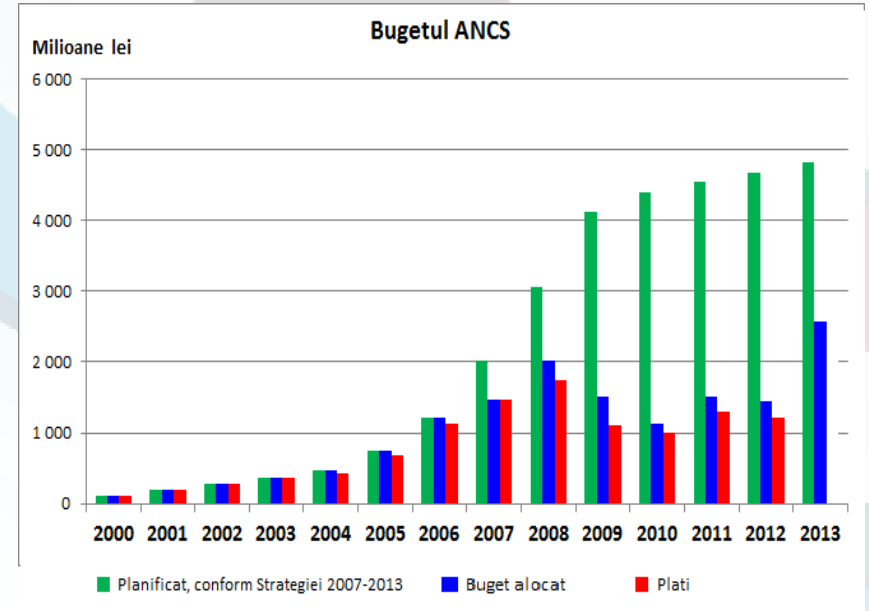
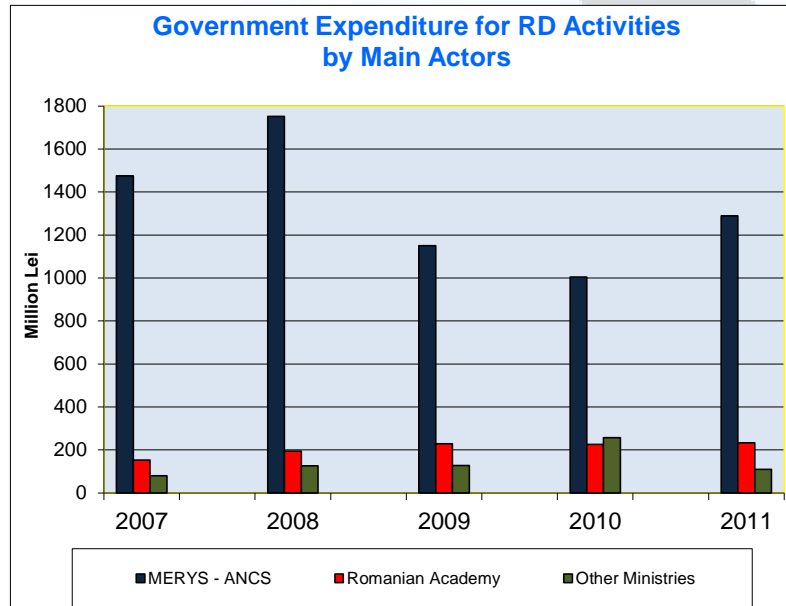
## **Lessons learnt from the implementation of the 2007-2013 Strategy for RDI**

- ✓ *The institutional framework needs*
  - *stability, administrative capacity, professionalism-good practices,*
- ✓ *The legal framework should provide*
  - *predictability, better coordination, CNPST*
- ✓ *The budget allocation within*
  - *multiannual framework*
- ✓ *Priorities supported by*
  - *Capacity –Potential; performing RDI activities*



## The Budget

- R&D national budget



- R&D structural funds - ~ 650 Meuro (SOP-IEC/Axis 2)
  - ~ 13,7% of total structural funds (POS-CCE/all axes + ..)

Due to the financial crisis, severe budget cuts for R&D were performed in 2009 and 2010. Despite this reduction, programs dedicated to the human resources and international cooperation were not affected.

## RDI in support of economic competitiveness (I)

### ➤ *highest productivity growth rate in the EU in the last 10 years*

- total productivity growth/ by all factors/: 50% in 2008; 35% în 2011
- decrease between 2008-2011, because of the economic and financial crisis

but

### ➤ **modest innovator**

- EU: position 24 of EU27 (~ ½ of EU27 SII – summary aggregated innovation index - 2010: 0,513/ 0,236)
- global: position 77 out of 150 countries (*World Economic Forum - Global Competitiveness Report 2011*)
- (still) efficiency-based economy (low cost resources), as compared to innovation-based economies in advanced countries

### ➤ **imbalances in RDI capacity:**

- mainly based in the public sector; **private sector R&D counts for only 38,3%** (EU average: 61,5%)
- **low R&D expenditure** in both public and private sector (38% and, respectively, 15% of EU27 average);
- **very high non-R&D innovation expenditure** (192% of EU27 average)
- an estimated **15.000 romanian researchers working abroad** (~ 10.000 researchers in the country)

yet

- Very high rate of PhD graduates (87% of EU27) - coming from structural funds projects
  - S&T cooperation well distributed all over Europe:
    - France, Germany, Italy, UK Spain as main co-publication partners,
    - Germany, Ireland: main co-patenting partners
  - Trade balance: significant increase in favour of medium and high-tech sectors
- ***World Bank estimations: improving the quality and increasing aggregate R&D to EU 2020 target in Romania would raise GDP by 12% by 2025***

## RDI in support of economic competitiveness (II)

Romania's economic competitiveness - International evaluation

➤ *EU comparative analysis – European Innovation Scoreboard (EIS) 2010*

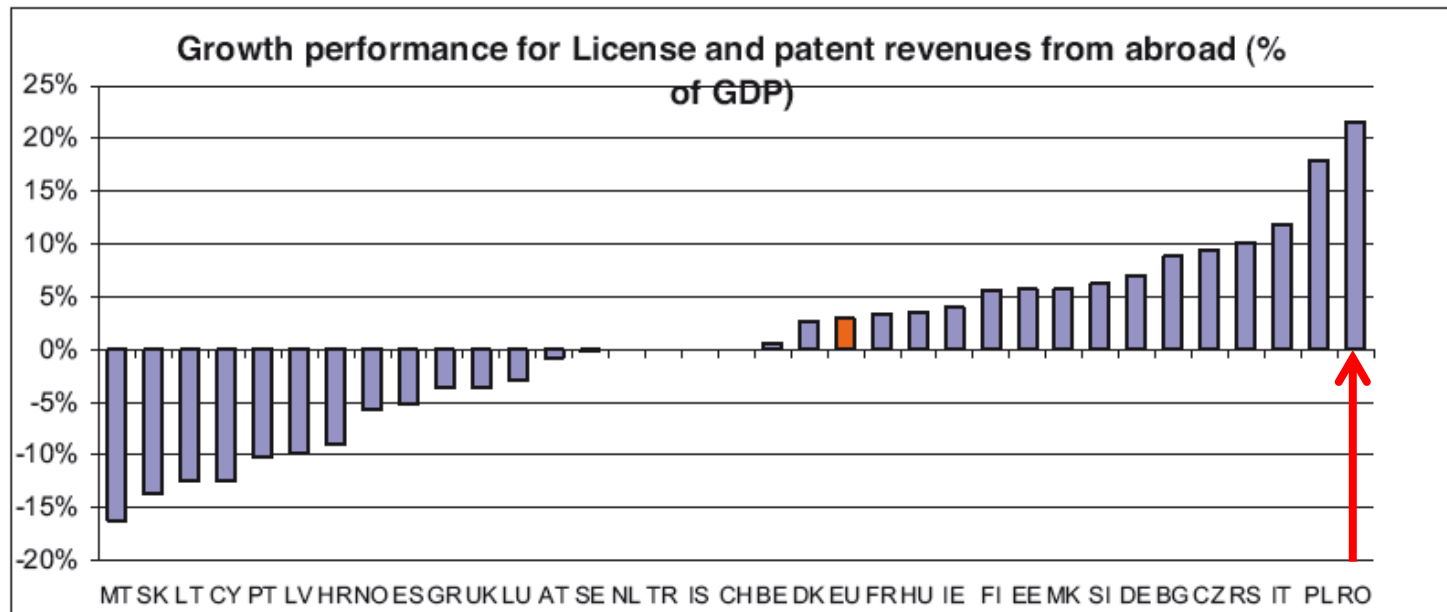
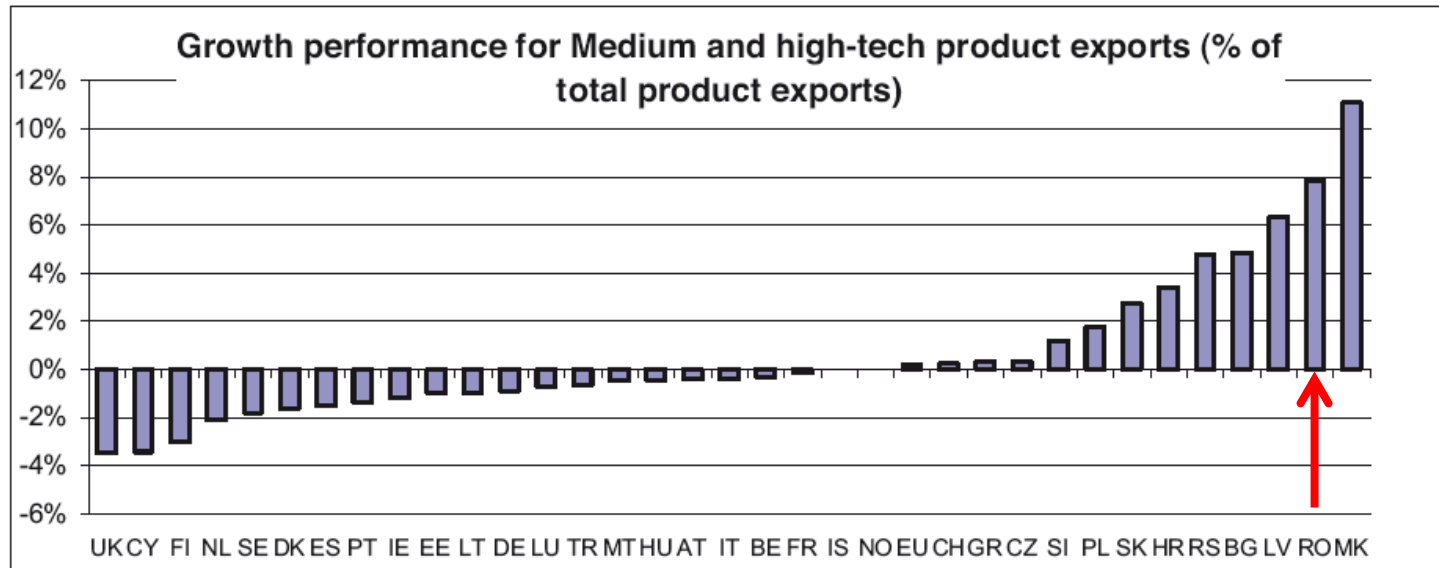
Indicator	RO	UE 27	Gap
<b>Summary Innovation Index SII</b>	<b>0.236</b>	<b>0.513</b>	<b>&lt; 1/2</b>
<u>System Capacity</u>			
Researchers (share of total employment)	3.64‰	9.20‰	~ 1/3
RD Personnel (share of total employment)	5.04‰	15.50‰	~ 1/3
Human Res. in ST (share of total employment)	22.90%	39.25%	~ 1/2
<u>Financial support</u>			
GERD (% GDP)	0.48	2.00	~ 1/4
Public RD expenditure (% GDP)	0.29	0.75	< 1/2
Business RD expenditure (% GDP)	0.19	1.25	~ 1/6
<u>Economic Effects</u>			
Mid and HiTech Product Exports	50.14%	47.36%	No gap!
Knowledge Intensive Services Exports	44.91%	49.43%	Almost equal
Employment in knowledge intensive activities	6.16%	13,03%	~ 1/2

## RDI in support of economic competitiveness (III)

### ➤ EU comparative analysis - Innovation Union Scoreboard 2011

Indicator	Share of <u>EU27 ~ 100%</u>
<u>Human resources</u>	54
Population aged 30-34 completed tertiary education	
New doctorate graduates	87
<u>Excellence/ Attractiveness Research Systems</u>	
International scientific co-publications; Top 10% most cited publications world wide	46; 39
Non-EU doctorate studies	11
<u>Finance and support</u>	
R&D expenditure in the public sector	38
R&D expenditure in the private sector	15
Non-R&D innovation expenditure	192
<u>Innovators</u>	
SMEs introducing product or process innovations	53
SMEs introducing marketing or organisational innovations	66
<u>Economic Effects</u>	
Employment in knowledge intensive activities	44
Medium and HighTech Product Exports; Knowledge Intensive Services Exports	105; 100
Sales of new to market and new to firm innovations	112

## RDI in support of economic competitiveness (IV)



## RDI in support of economic competitiveness (V)

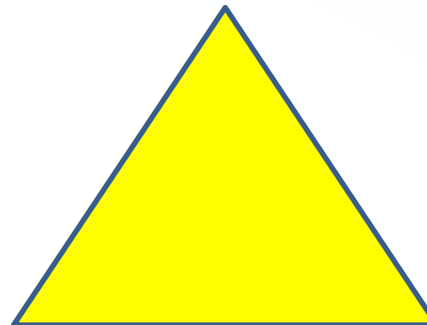
### ❑ **Main gaps to cover (to reach current EU27 average):**

- **Highly qualified personnel: need to increase at least 2,5 – 3 times, especially in the private sector, in knowledge intensive activities**
  - **R&D personnel/ total (~ 1/3 of current EU27)**
  - **employment in knowledge intensive activities (< 50% of current EU27)**
- **Increase of R&D expenditure:**
  - **at least 2,5 times in the public sector (38% of current EU27)**
  - **at least 6 times in the private sector (15% of current EU27)**

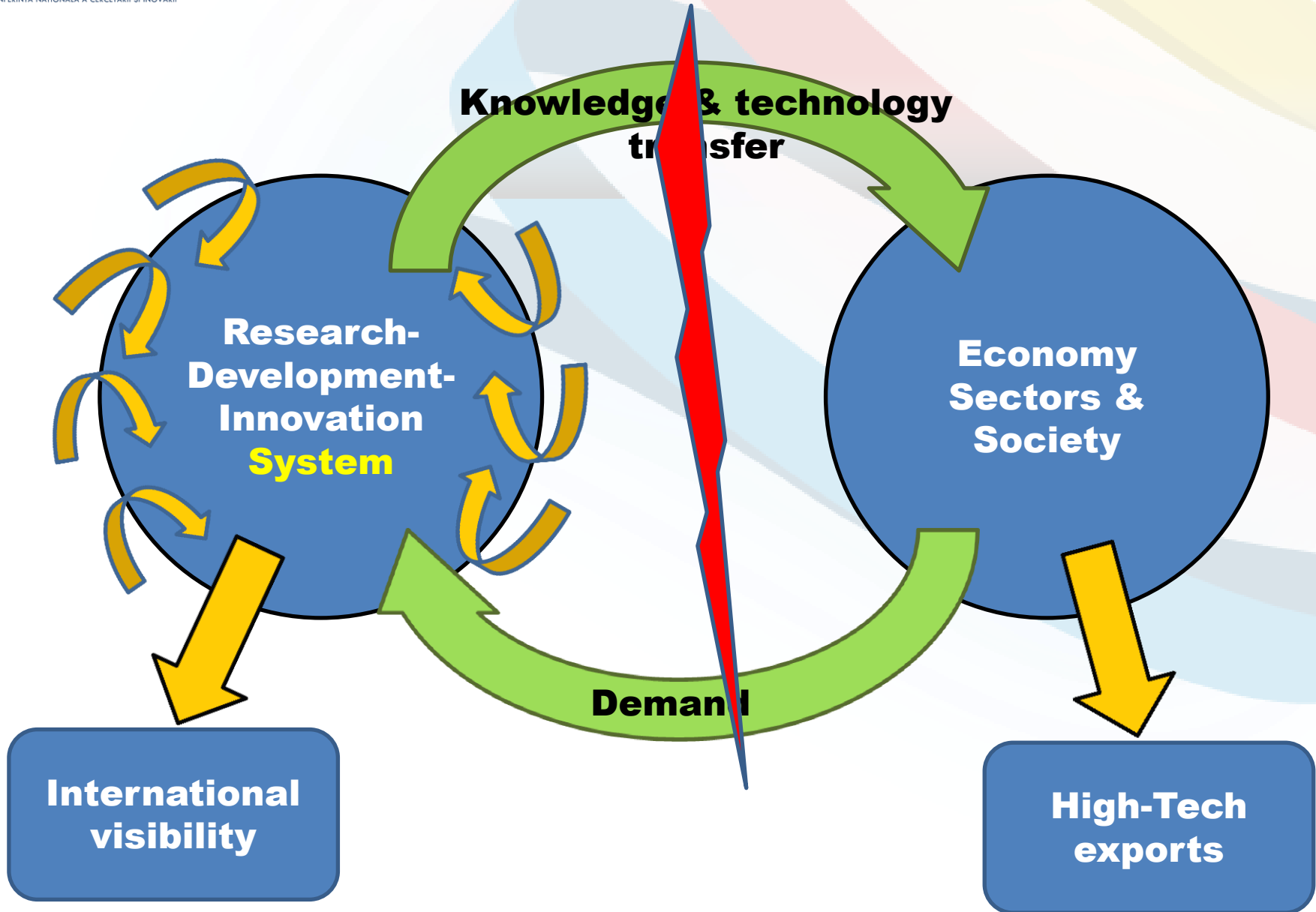
### ❑ **Main challenge for government innovation policies in the next 10 years**

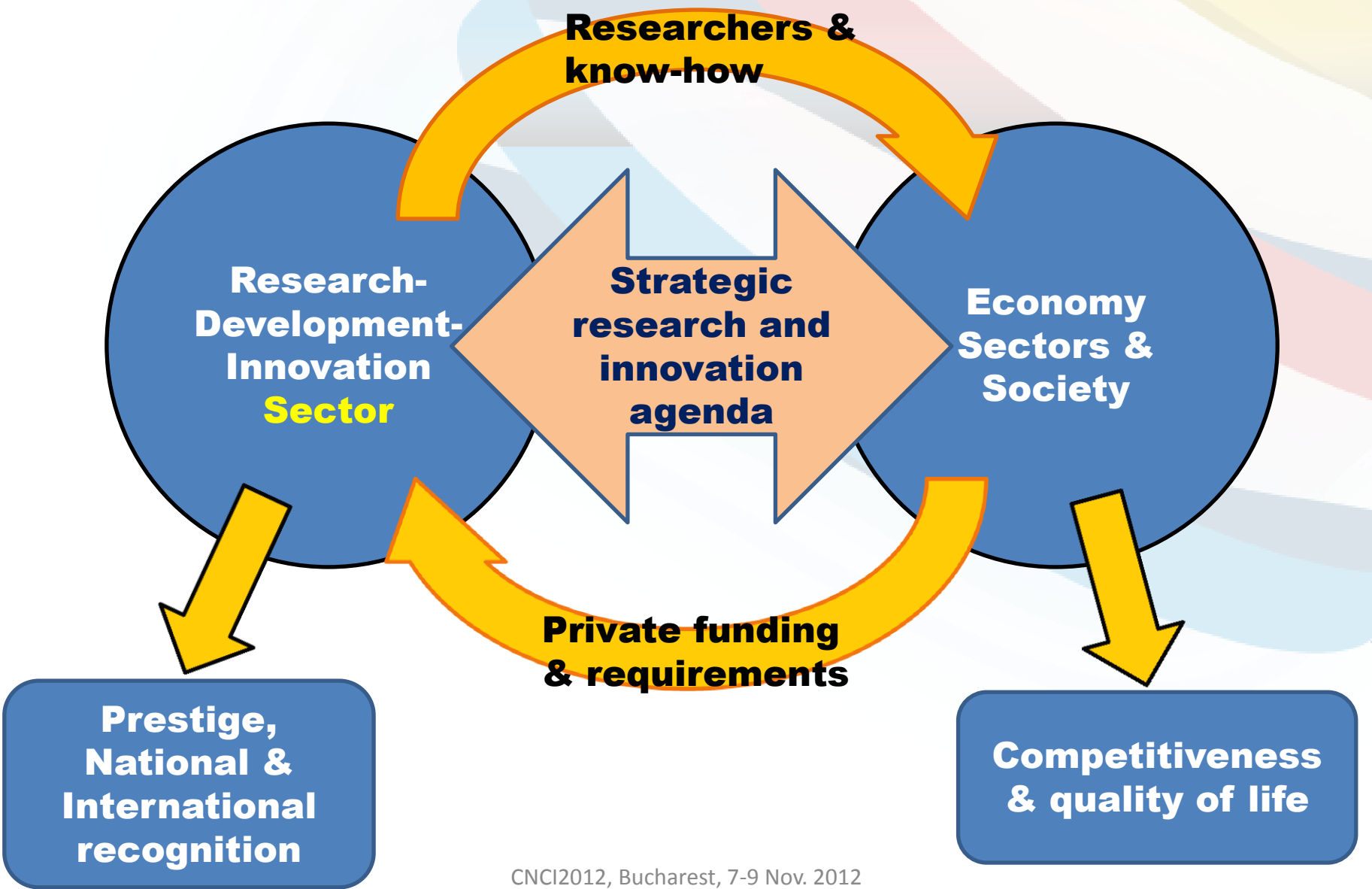
***We need a R&D-based innovative climate in economy***

***Steep increase of R&D investment  
in the private sector  
(human resources, expenditures)***



***Sectors/domains/regions with a  
high innovative potential***







## Paradigm shift for the 2014-2020 National RDI Strategy (III)

- What are the priorities, How better use and exploit our resources? Smart specialization
  - Dedicated project launched by ANCS in September 2012, to be finalized in September 2013
  - Preparatory activities launched by ANCS:
    - Analysis of R&D-based economic growth potential – identification of smart specializations (collaboration with JASPERS = consultant for European Commission and European Investment Bank )
- The Strategy will result from a broad and transparent process of consultation and prioritization
- The strategy will address national & regional priorities
- A paradigm change  
SYSTEM (upgrading and consolidation) → SECTOR  
(innovation and competitiveness )

**Thank you!**