

# Serbia's national innovation system and its performance

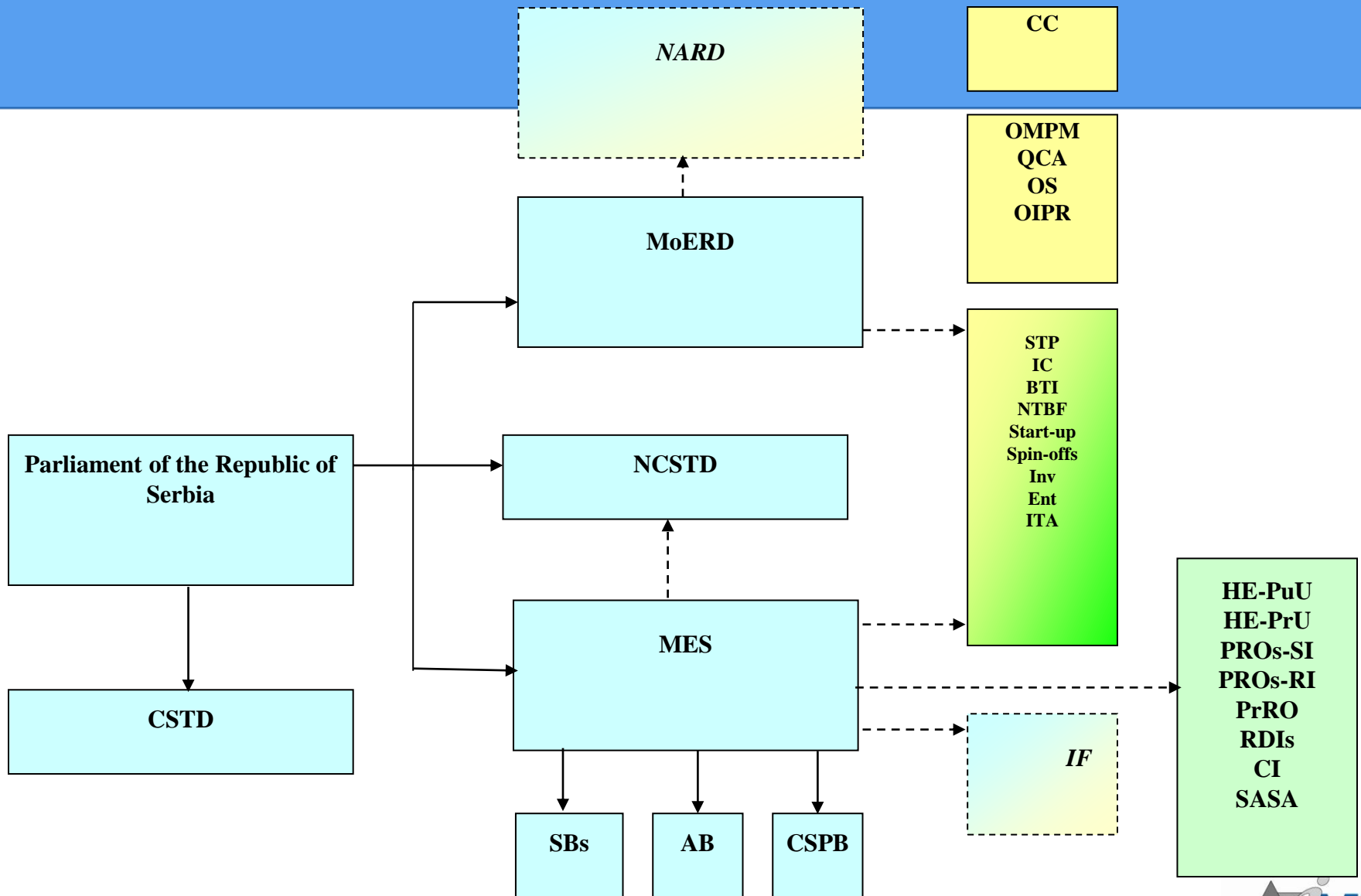
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# Innovation governance in the Republic of Serbia



## Strategy of S&T Development of the Republic of Serbia 2010-2015

*Vision of the development of the Serbia in XXI century:  
Knowledge Based Society and Economy*

*„The Republic of Serbia as an innovative country, where scientists attain European standards, contribute to society's overall level of knowledge and advance the technological development of the economy.“*

**Ministry of Education and Science**

**Objective:**

*National Innovation System:*

*The ultimate objective is to create a system that fosters strong national innovation*

## Strategic Vision

*„The development of an Entrepreneurial Economy, based on knowledge and innovativeness, which creates strong, competitive and export oriented SME sector and sustainability contributes to an increase in living standards in the Republic of Serbia.“*

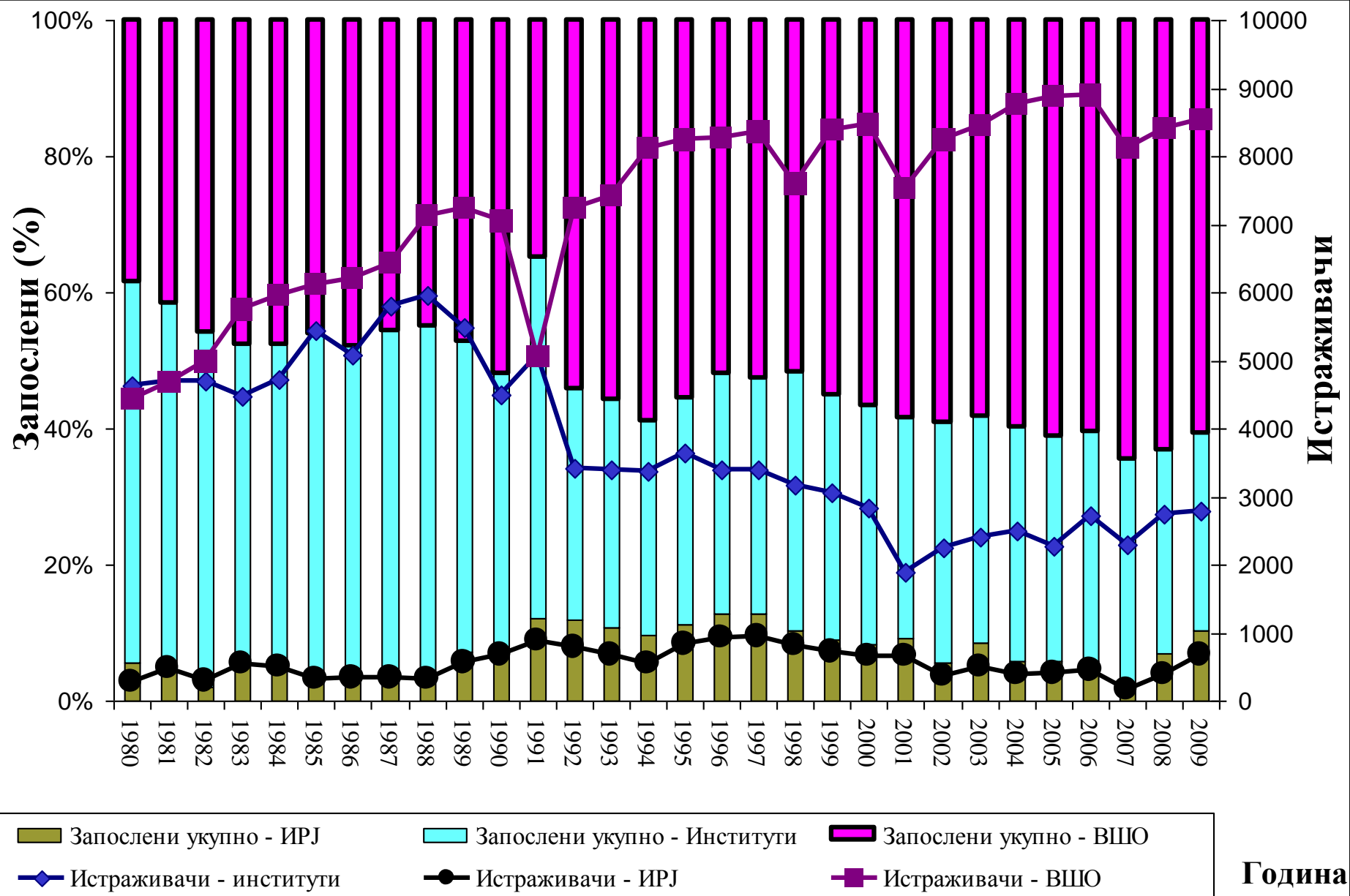
## Ministry of Economy and Regional Development

The Strategy is based on five pillars, further developed in modules and measures, corresponding to the priorities in SME development and aimed to contribute to improving the performance of the entrepreneurs through all stages of start-up, growth and development of SMEs:

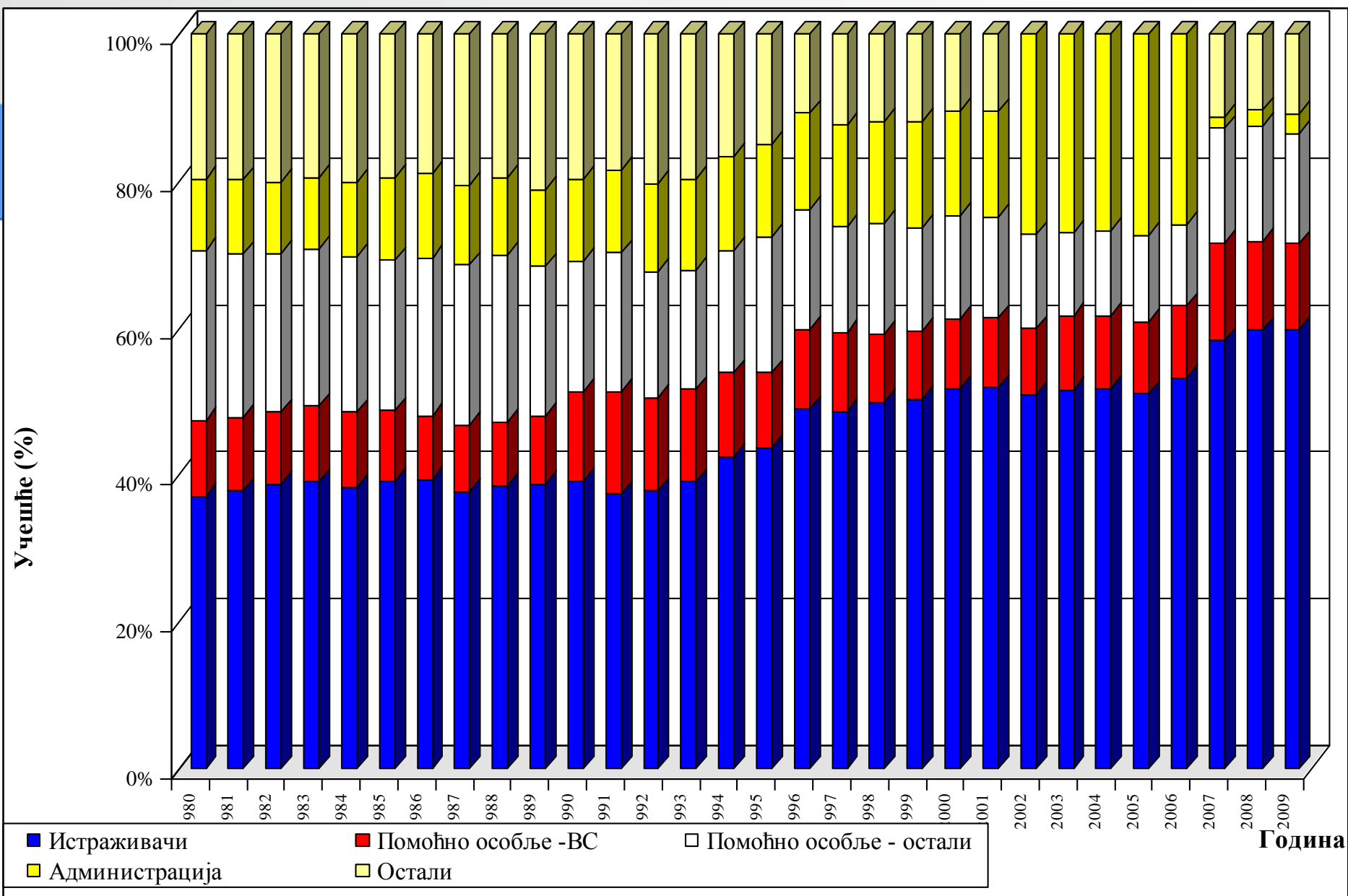
**Pillar 1** deals with potential entrepreneurs, the conditions for establishing a start up and encouraging micro enterprises development within the SME sector.

**Pillars 2-4** define specific types of support to SMEs for growth and development, i.e. for transformation of micro into small and small into medium-sized enterprises.

**Pillar 5** is targeted at improving general business environment, whatever the size of the enterprise.

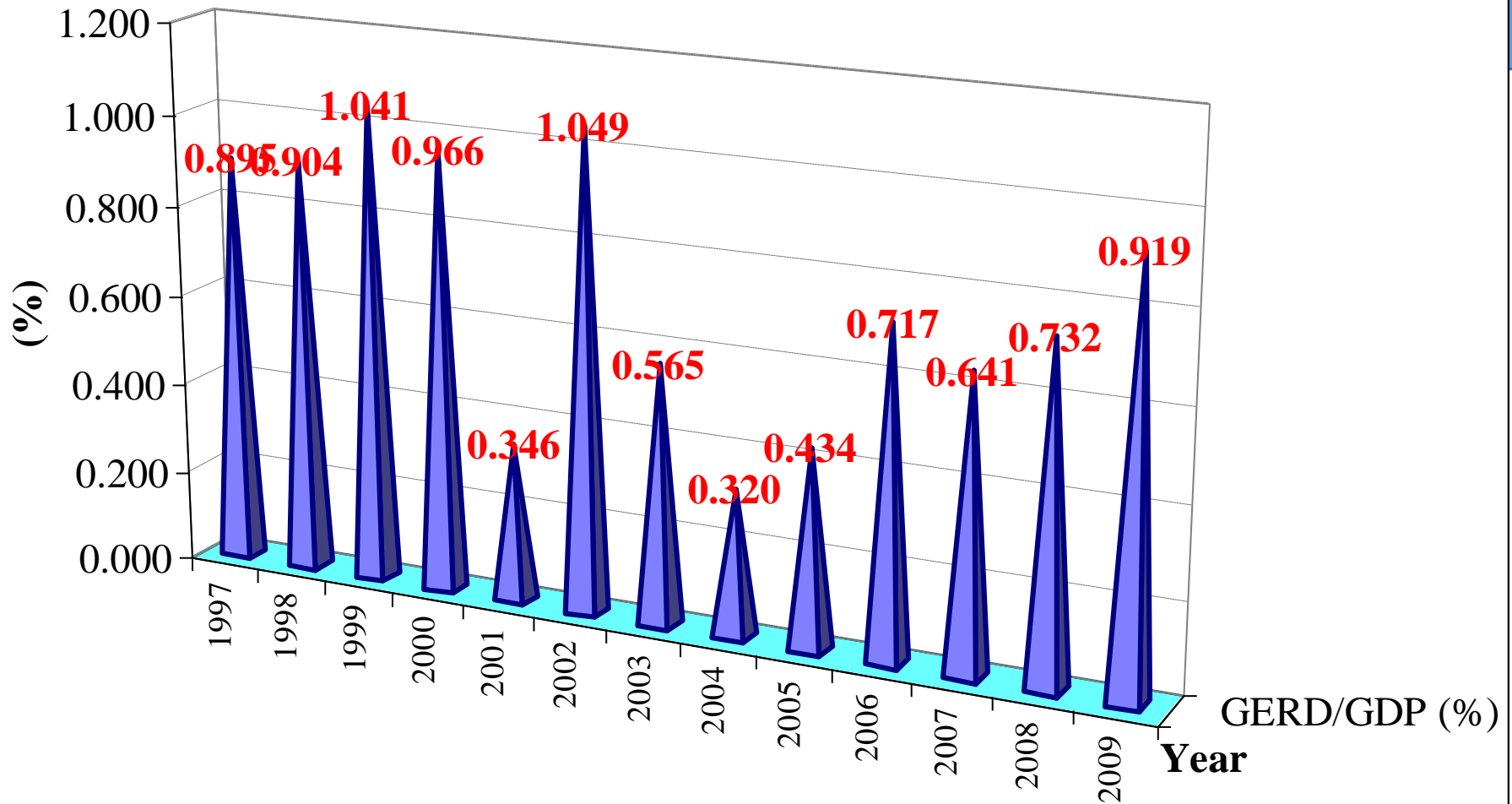


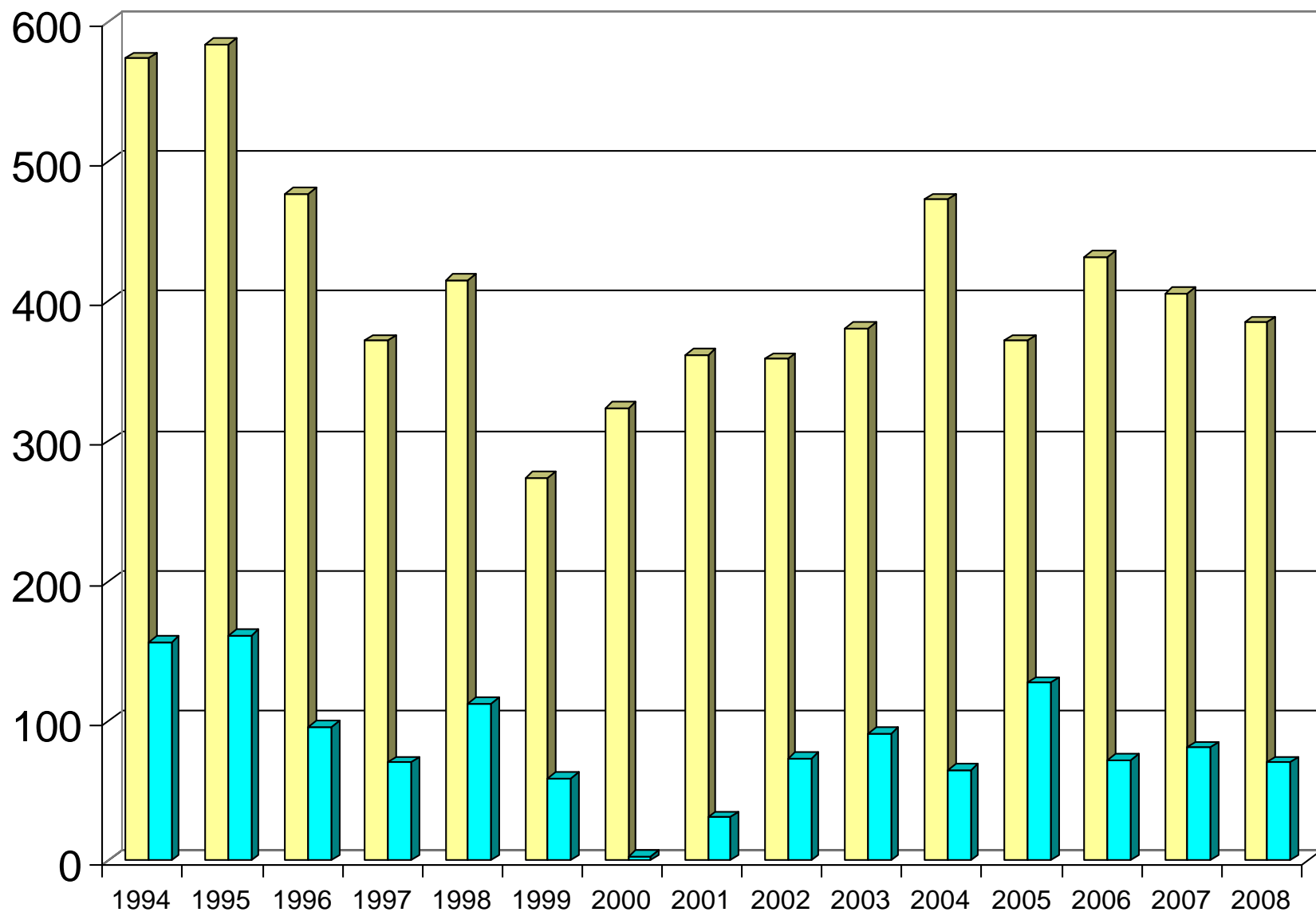
# Serbia – R&D system: Employment, Researchers



## Serbia – R&D system: Employment

# Serbia: GERD/GDP (%)



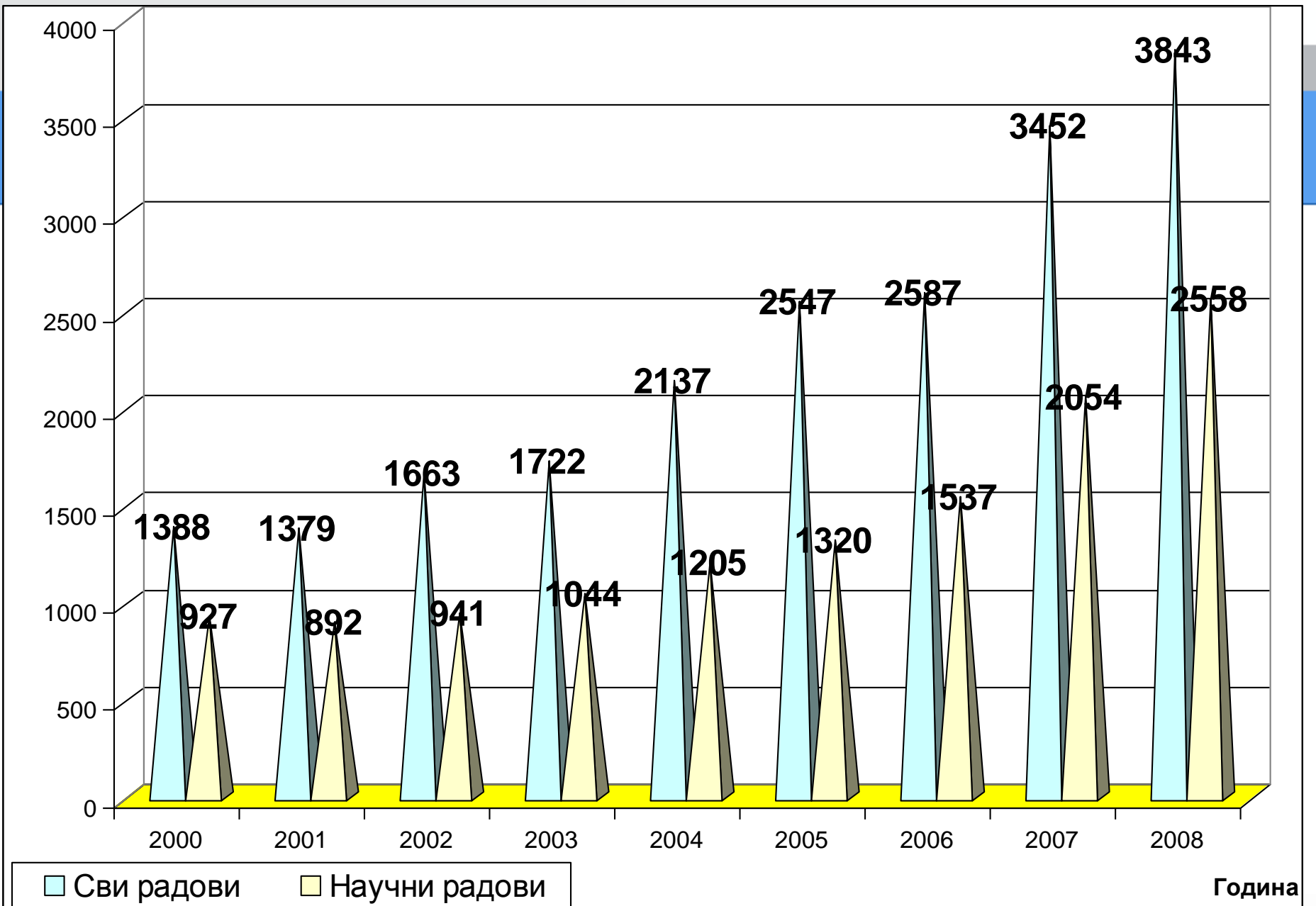


■ Патенти - пријаве
 ■ Регистровани патенти

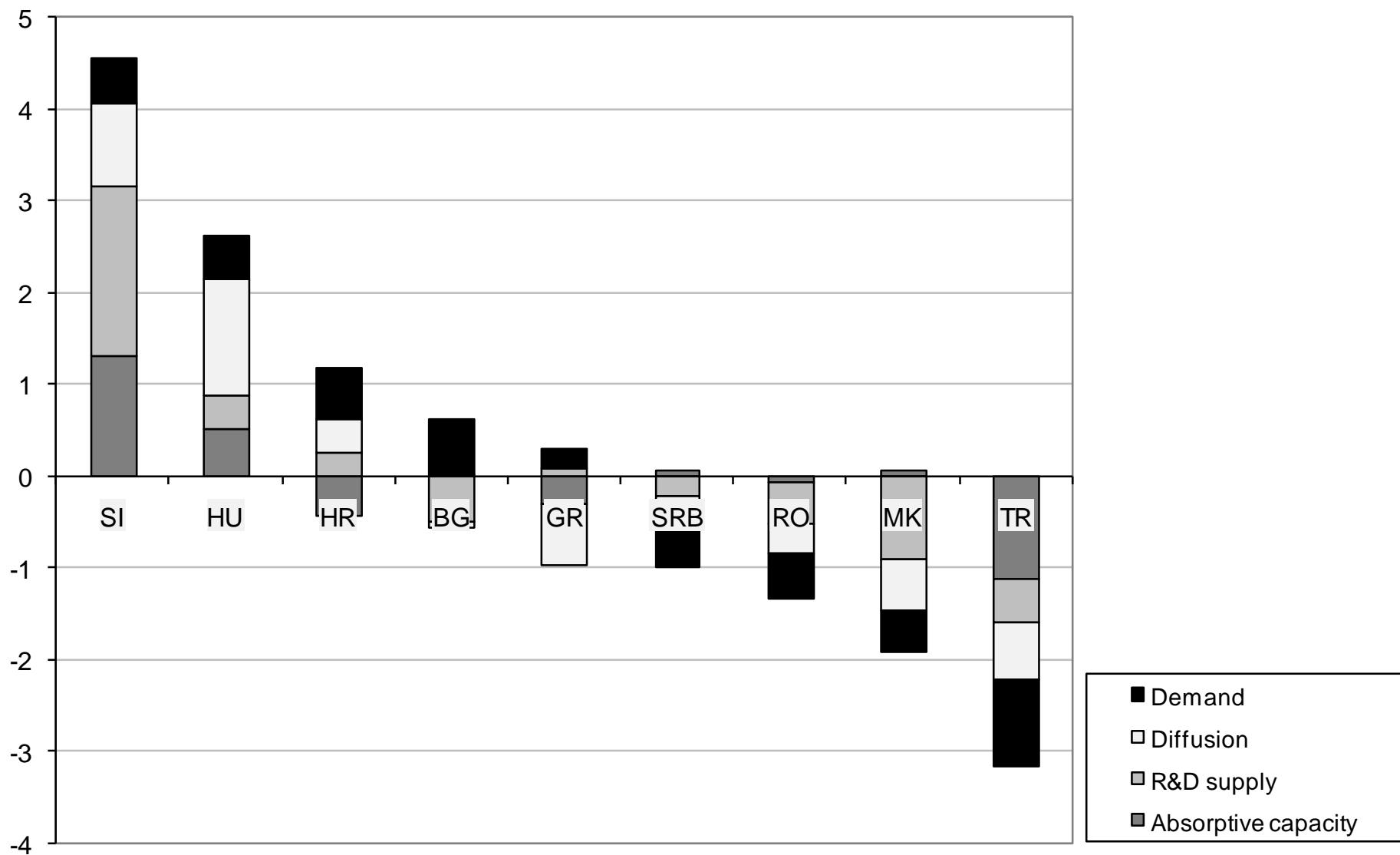
**Година**

## Patent activity in Serbia





ISI – Authors from Serbia – number of papers



Radosevic, Kutlaca, 2010: National innovation capacity of the SEE countries

# STRENGTHS

- Serbian **budget allocations** for science grew significantly
- **Rising number of papers on the SCI list and the number of citation**
- **Adopted institutional framework** for restructuring and transformation of R&D system
- **Good information support system** for public R&D sector through COBISS
- Number of SMEs invest in inner R&D
- FDI in R&D (SMEs suppliers of foreign corporations)

## WEAKNESS

- The **absence of coordinated governance and funding of NIS in Serbia**
- Still present **linear model of governance of the R&D and innovation system**
- **The attractiveness of R&D system for private investments in R&D is insufficient**
- **Undeveloped infrastructure for innovative entrepreneurship and lack of culture for technological entrepreneurship HES and public R&D**
- **Absence of an evaluation culture and practice in R&D and innovation system**
- **Insufficient knowledge about R&D and innovation capacities in business sector**
- **Recognition of the needs for financing of innovation activities with a much larger budget and significantly increased financing per innovation grant**
- **Lack of demand-side R&D and innovation policy tools and measures**
- **Obsolete R&D infrastructure**
- **Mobility of researchers is, at present, a one-way move**
- **Very modest participation of R&D and innovative and corporate organizations in FP7:**
  - **Less than 20% of researchers have been involved in EU projects;**
  - **No single HE institution from Serbia within “Shanghai top 100 HE”**
  - **The number of patents registered by R&D organizations is low**

# OPPORTUNITIES

- The development of a **national innovation system** is an overall aim of S&T

## Strategy

- The special programme for **development of human capital** in Serbia
- HE Law and Innovation Law which stimulates and legally approves **creation of university and PROs spin-offs**.
- financial scheme for financing of the **Innovation fund** activities
- Public funding** of investments in R&D and Innovation activities in the period 2011-2014 will be realized under the S&T Strategy
- Three programs** for funding of – Basic Research, Technological Development and Integrated and Interdisciplinary Research
- The Law on Higher Education (LHE),**
- Innovation Law**
- Commercialization of R&D results** must be among the highest priorities for MES
- International S&T cooperation**
- The Republic of Serbia became the **member of the European Patent Organization**
- The **MINI GRANTS Programme**
- The **Programme for Supporting SMEs and Entrepreneurs** to Strengthen Innovation Activities

# THREATS

- **Impact of the economic crisis on the R&D expenditure** could be strongest in the public sector
- **Ageing of the research population**
- **Drain of highly educated individuals from the country**
- Crucial challenge for research governance in Serbia is question how **to increase R&D and Innovation activities in Business Enterprise Sector**
- **No equivalence in the High Education Law for research and scientific positions in High Education institutions**
- **Policy instruments for knowledge circulation promotion** could have limited effects

# The key structural challenges faced by the national innovation system in Serbia are:

1. **The absence of coordinated governance** and funding of national innovation system in Serbia between main ministries and public funding sources as a consequence of the fact that the concept, purpose and functioning of innovation is not sufficiently developed and accepted in the economy and the society in Serbia.
2. Still present **linear model of governance** of the R&D and innovation system in the country; this is the main obstacle for networking of R&D sector with the rest of economy and society. A crucial challenge for research governance in Serbia is the question how to increase R&D and Innovation activities in the BES.
3. One of the significant problems in preserving and strengthening the scientific community is the ongoing **drain of highly educated individuals from the country.**

# The key structural challenges faced by the national innovation system in Serbia are:

4. The attractiveness of R&D system in Serbia for **private investments in R&D** is insufficient because of the present structure and capacities of public R&D system. Restructuring of public R&D system and integration of BES into national innovation system is primary task for the government. In addition, legal framework is not in favour of private sector engagement in R&D and innovation activities.
5. **Undeveloped infrastructure for innovative entrepreneurship** and lack of culture for technological entrepreneurship in Higher Education Sector (HES) and public R&D laboratories and institutes (PRO – Public Research Organisations).



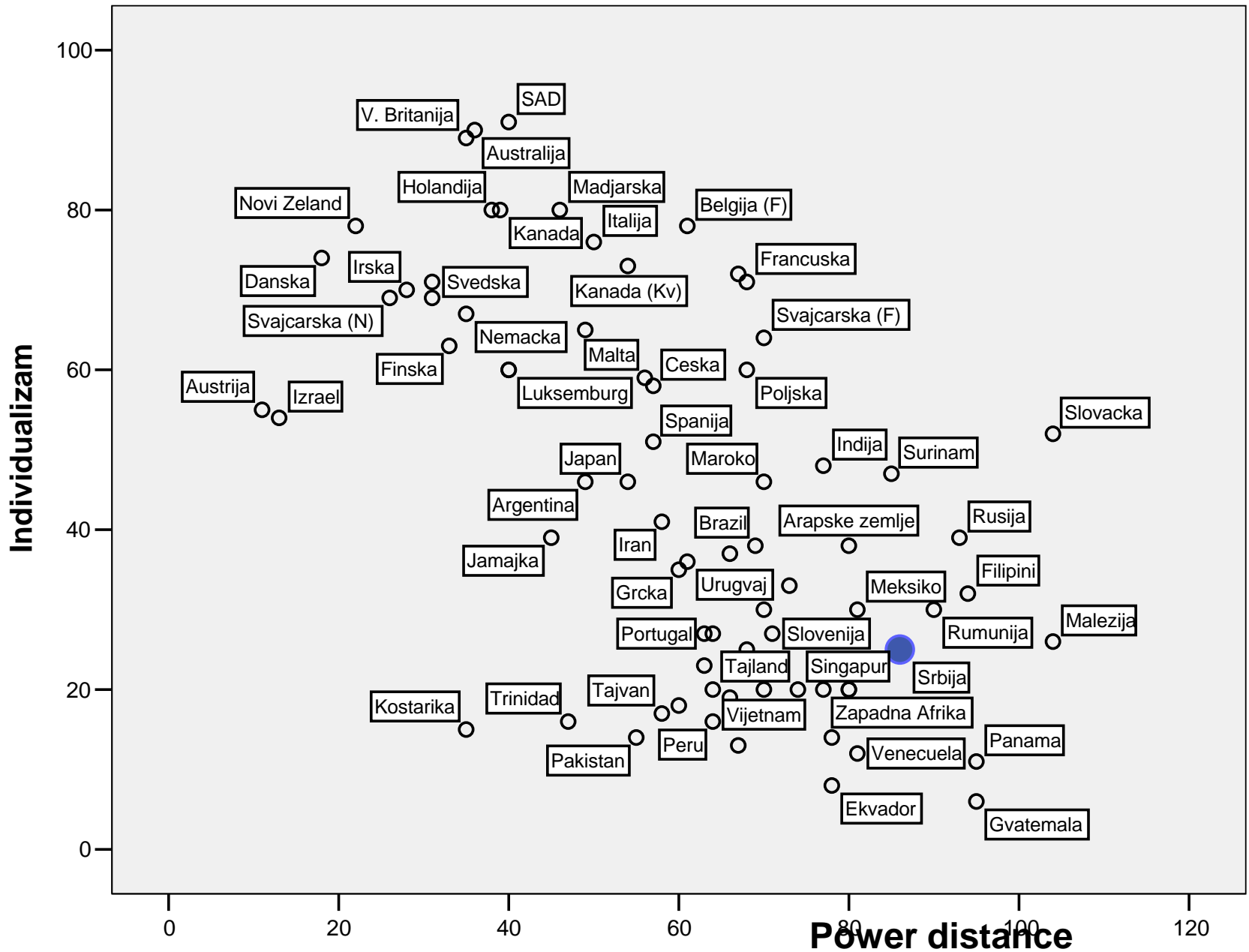
## The key structural challenges faced by the national innovation system in Serbia are:

6. Absence of evaluation culture and practice in R&D and innovation system in Serbia;
7. Insufficient knowledge about R&D and innovation capacities in BES;
8. Recognition of the needs for financing of innovation activities with a much larger budget and significantly increased financing per innovation grant;
9. Lack of demand-side R&D and innovation policy tools and measures in Serbia.

<b>WOS search TOTAL</b>	2555	2603	3526	4111	4785	5027	22607
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<b>Web of Science Category</b>	<b>2005 (#)</b>	<b>2006 (#)</b>	<b>2007 (#)</b>	<b>2008 (#)</b>	<b>2009 (#)</b>	<b>2010 (#)</b>	<b>2005-10</b>
ENGINEERING ELECTRICAL ELECTRONIC	161	140	261	261	277	172	1272
MEDICINE GENERAL INTERNAL	11	12	28	312	332	358	1053
CHEMISTRY MULTIDISCIPLINARY	157	145	200	155	163	178	998
MATHEMATICS APPLIED	78	102	139	155	240	236	950
MATERIALS SCIENCE MULTIDISCIPLINARY	135	146	171	149	149	155	905
CLINICAL NEUROLOGY	161	114	82	144	187	160	848
PHARMACOLOGY PHARMACY	87	107	125	169	163	138	789
ONCOLOGY	132	94	108	130	152	144	760
PHYSICS APPLIED	55	90	189	128	157	107	726
MATHEMATICS	69	87	116	139	152	141	704
PHYSICS MULTIDISCIPLINARY	66	69	165	103	179	115	697
NEUROSCIENCES	120	92	56	129	142	132	671
CHEMISTRY PHYSICAL	76	73	136	94	139	107	625
ENGINEERING CHEMICAL	19	46	100	115	175	158	613
BIOLOGY	23	36	106	132	135	162	594
BIOCHEMISTRY MOLECULAR BIOLOGY	77	68	82	81	150	102	560
TELECOMMUNICATIONS	175	19	97	42	121	40	494
HEMATOLOGY	23	40	69	99	72	154	457
ENVIRONMENTAL SCIENCES	46	43	65	71	116	113	454
PERIPHERAL VASCULAR DISEASE	50	97	43	75	59	104	428
OPTICS	40	55	84	103	79	66	427
PLANT SCIENCES	49	55	89	93	60	70	416
ASTRONOMY ASTROPHYSICS	38	73	44	129	89	42	415
COMPUTER SCIENCE THEORY METHODS	48	34	57	60	120	72	391
COMPUTER SCIENCE ARTIFICIAL INTELLIGENCE	28	51	64	106	80	59	388
COMPUTER SCIENCE INFORMATION SYSTEMS	96	9	47	78	103	51	384

WIPO N Technical Unit	PAI1	PAI2	PAI3	PAI4	PAI5	PA-tot
	1995-1997	1998-2000	2001-2003	2004-2006	2007-2009	1995-2009
13 Chemistry (Organic)	2143	12395	585	70	86	15279
31 Electricity (Electronic Circuits, Communication Techniques)	1330	12483	16	22	14	13865
4 Health; Amusement	1317	10502	192	227	231	12469
5 Preparations for medical, dental or toilet purposes	1433	10044	388	141	210	12216
27 Instruments (Horology, Regulating, Computing)	788	10501	55	58	34	11436
16 Chemistry (Biochemistry, Sugar industry, Leather)	999	8949	53	37	20	10058
26 Instruments (Measuring, Optics, Photography)	945	7826	70	59	61	8961
30 Electricity (Electric Techniques)	878	7062	120	159	100	8319
32 Others (unclassified)	1273	7038	0	2	0	8313
10 Transporting	422	4740	140	134	72	5508
6 Separating; Mixing	594	4172	47	64	65	4942
20 Building	547	3271	151	187	90	4246
8 Shaping (Material Processing)	488	3392	50	101	73	4104
14 Chemistry (Macromolecular compounds)	402	3488	16	4	7	3917
15 Chemistry (Dyes, Animal and Vegetable Oils)	515	3198	49	31	23	3816
3 Personal or domestic articles	441	3063	91	103	71	3769
11 Micro-structural technology; Nano-technology	601	2349	21	68	51	3090
12 Chemistry (Inorganic)	326	2384	67	113	38	2928
23 Engineering in general	397	2351	70	64	32	2914
28 Instruments (Musical Instruments, Information Storage)	276	2247	24	39	25	2611
22 Engines or Pumps	366	1789	118	171	127	2571
2 Food stuffs; Tobacco	330	1855	75	102	151	2513
24 Lighting; Heating	295	1852	86	97	66	2396
7 Shaping (Metal)	244	1665	35	28	24	1996
1 Agriculture	222	1473	54	94	57	1900
17 Metallurgy	162	1537	44	30	12	1785
9 Printing	149	1211	15	13	5	1393
18 Textiles; Flexible Materials	149	1151	10	13	6	1329
19 Paper (including class B31)	151	1015	0	2	0	1168
21 Earth drilling; Mining	109	854	1	4	3	971
25 Weapons; Blasting	90	457	38	38	24	647
29 Nucleonic	20	177	5	11	3	216
Total	18402	136491	2686	2286	1781	161646



G.Hofstede, G.J. Hofstede, Cultures and Organizations Software of the Mind, (Intercultural Cooperation and Its Importance for Survival), Mc Graw Hill, 2005

# Business Enterprise Sector Pessimist vs. Optimist view:

- R&D - ?
- Innovation activities - ?
- Faculty of Technical Sciences, University of Novi Sad: 68+ spin-offs

# Questions



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# Answers