

Government Policy and Reforms in the Russian R&D Complex

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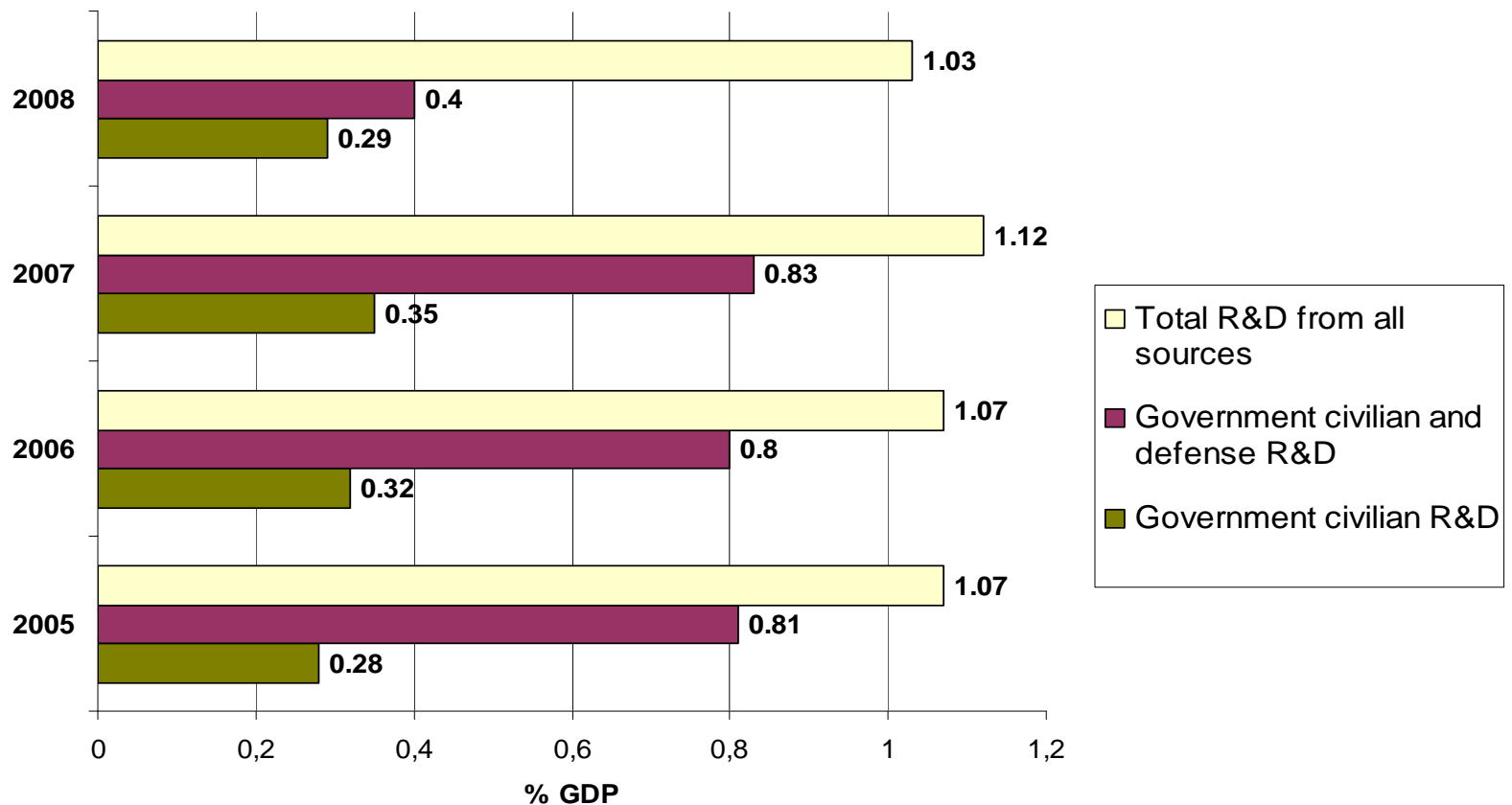
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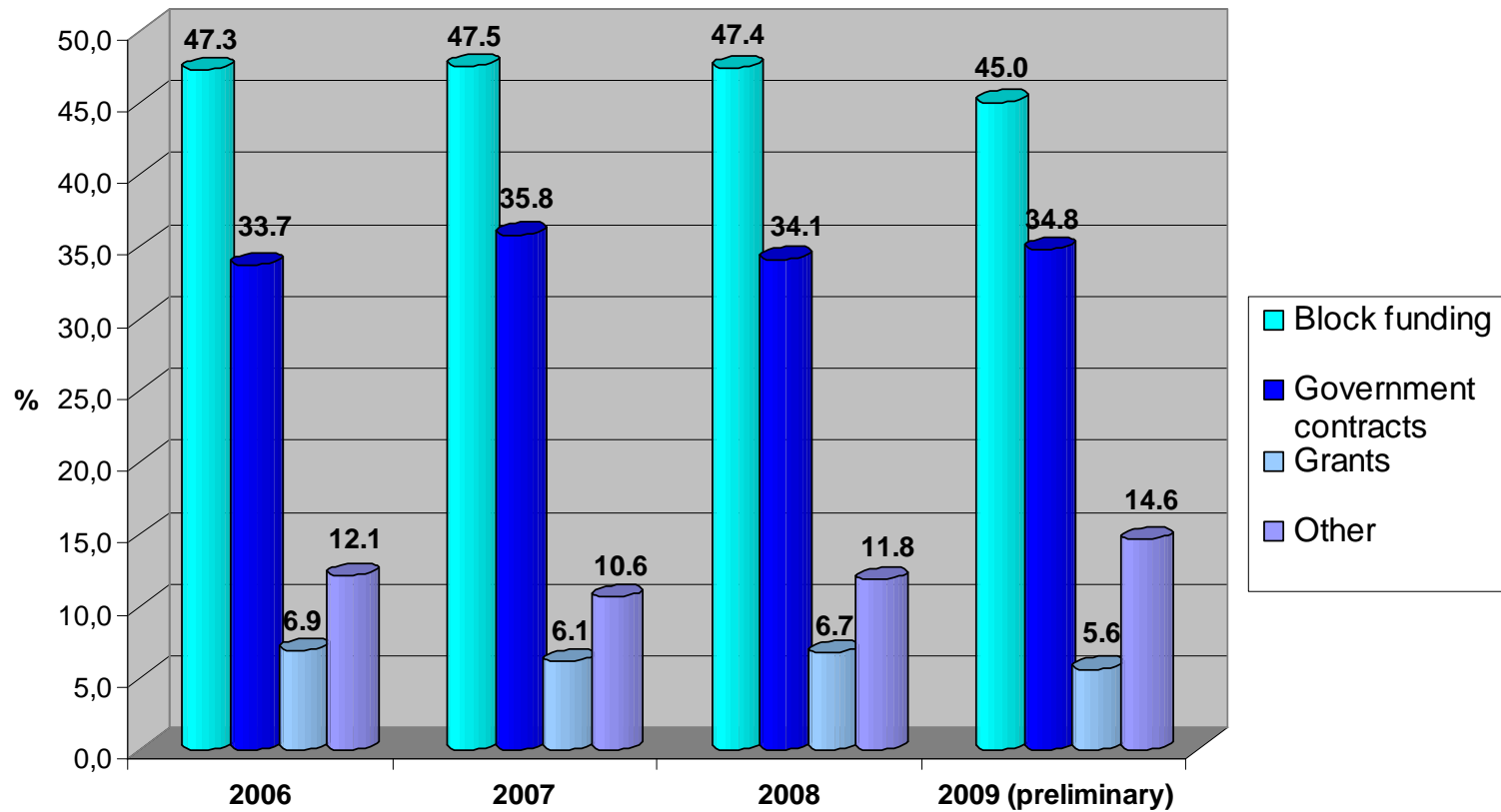
Major Trends in Financing R&D

- Government remains the major source of R&D financing (over 63% from the total expenditures on R&D – data for 2008)
- Business enterprise expenditures on R&D are low (22.4% of the total in 2008) and even lower during the crisis
- Foreign financing has decreased from 16.9% of total expenditures on R&D in 1999 (this was maximum) to 5.9% in 2008.
- Government claims growing competitive approach in distribution of government funds; however share of competitive funding is low (in Academy).
- Very low share of grant form of financing.

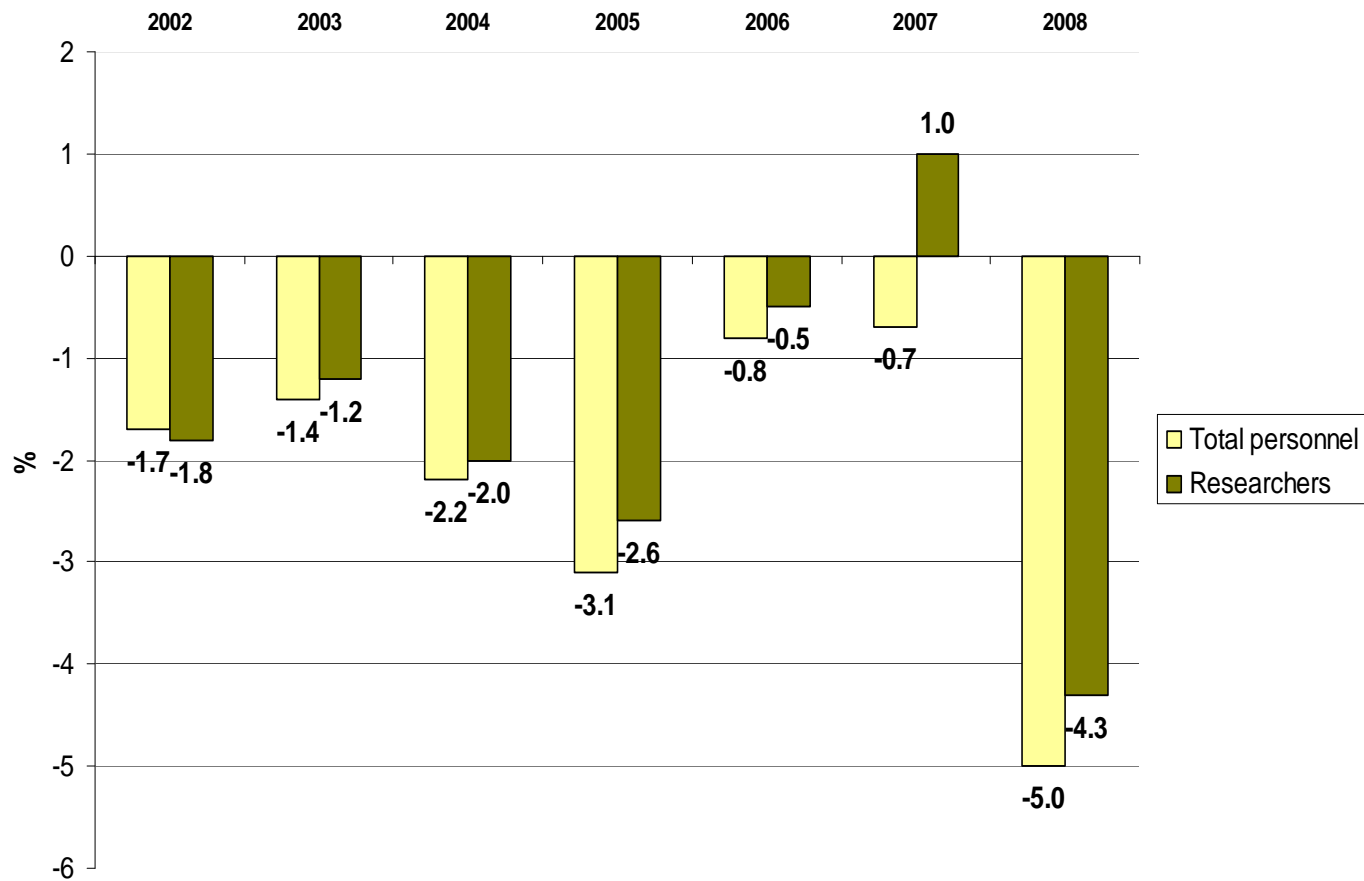
Expenditures on R&D in Russia, % GDP



Types of Government Financing of R&D, % to total



Changes in R&D Personnel, % to the Previous Year



Human Resources Policy

- Major focus – support of young researchers (up to 35 years old). Growing number of initiatives; larger grants.
- Turning “brain drain” into “brain gain”: new initiatives to attract scientific diaspora (joint R&D projects; conferences; teaching; peer reviewing).
- New policy to attract best world researchers to Russia (planned for 2010-2012): support to scholars ready to work in Russian universities.

New Government Program to Fix Workforce Problems

Federal Goal-Oriented Program “Research and Teaching Workforce of Innovative Russia for 2009-2013”:

- Total budget (assigned) – about 3.2 billion USD for 5 years; government share – about 90%.
- Support of leading research-educational centers and groups of researchers (over 80% of the total program budget);
- Support of joint research projects with Russian scientists-emigrants;
- Support of conferences, trainings, popularization of science among high school students.

Positive Features and Problems

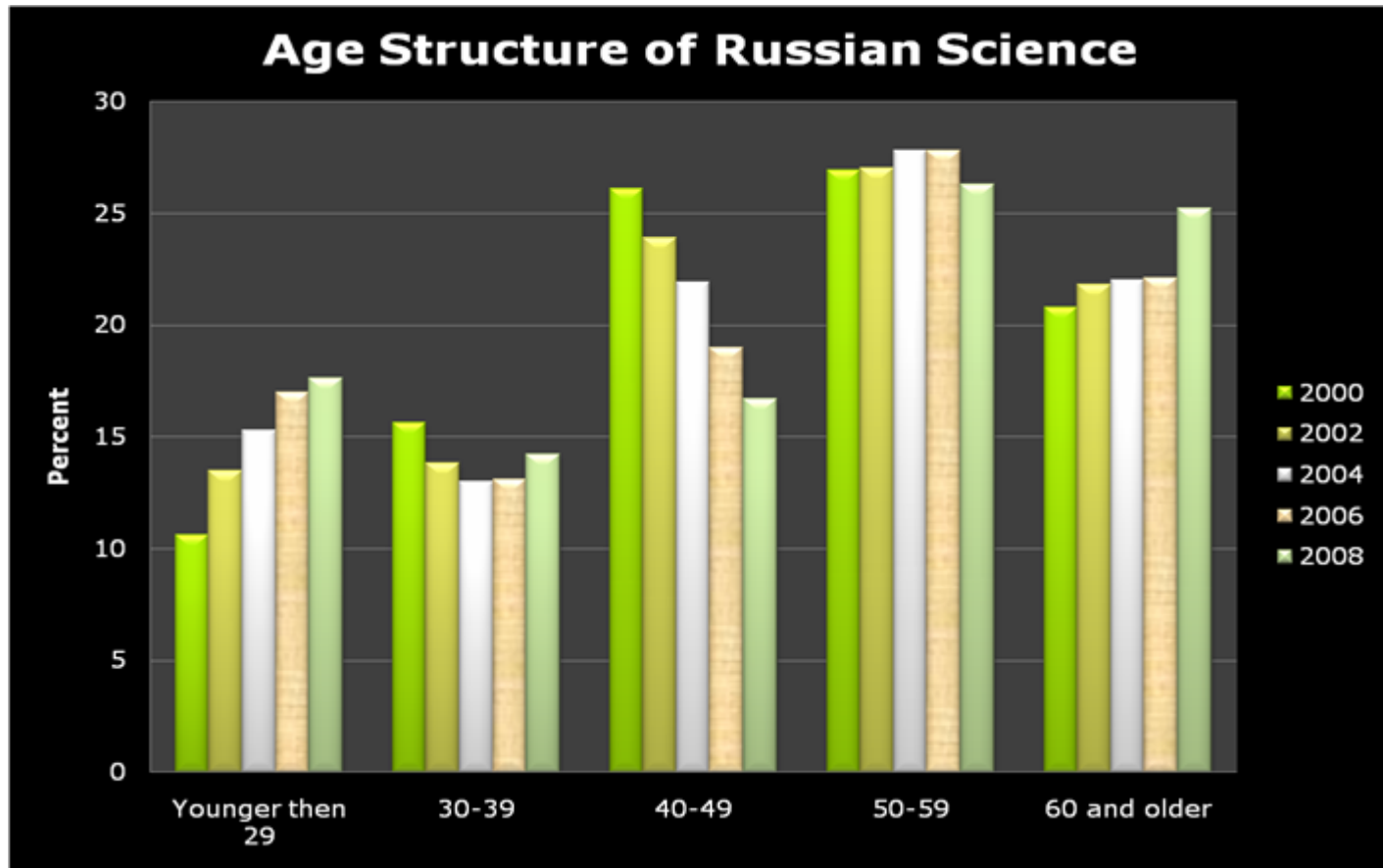
Positive Features:

- Support of integration of research and education
- Promotion of mobility
- Attraction of foreign specialists (emigrated Russian researchers) – “brain gain” policy

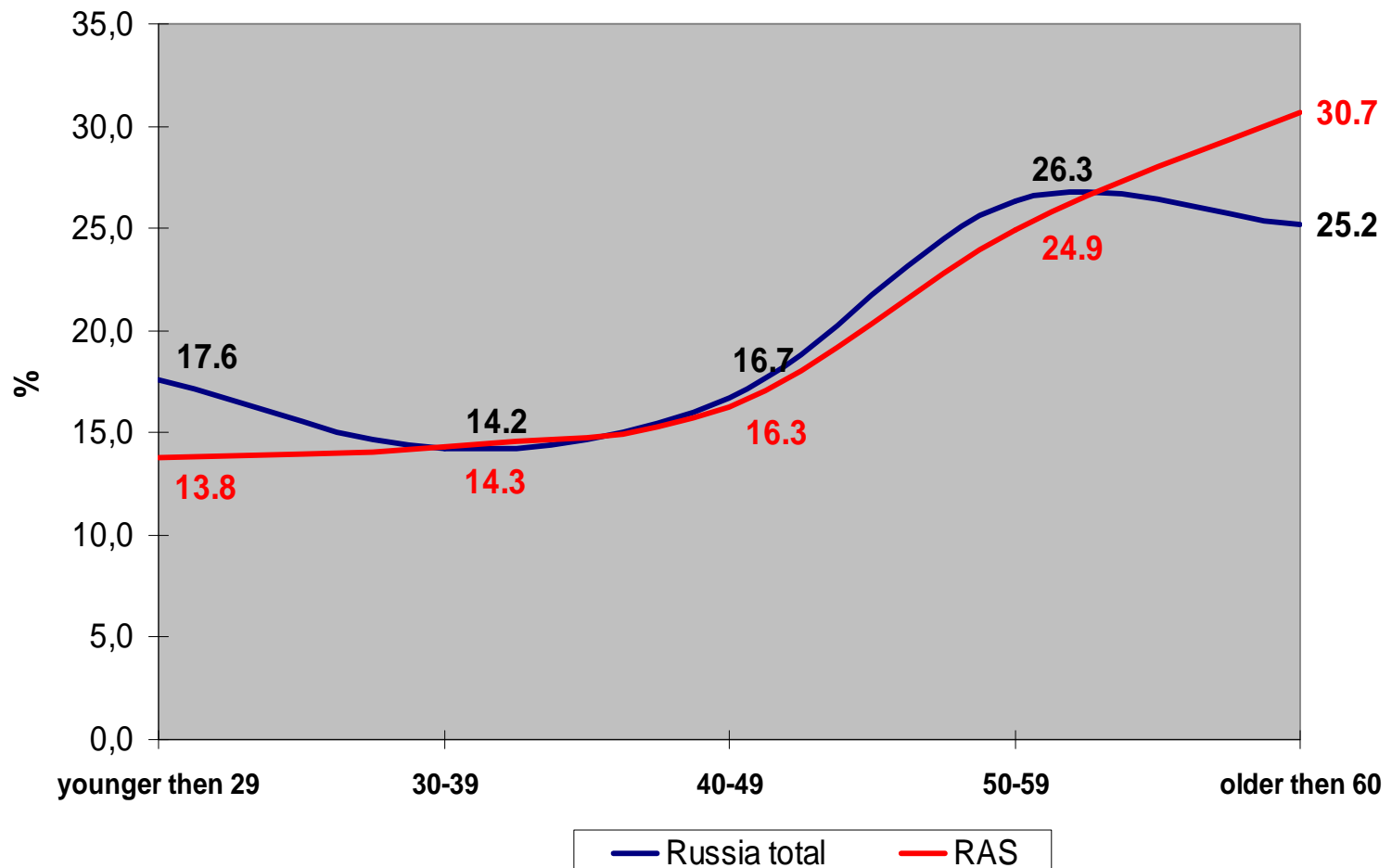
Problems:

- Little attention to older generations (especially those at retirement age) who are still very active in science;
- Bureaucratic regulations for cooperation with foreign scholars

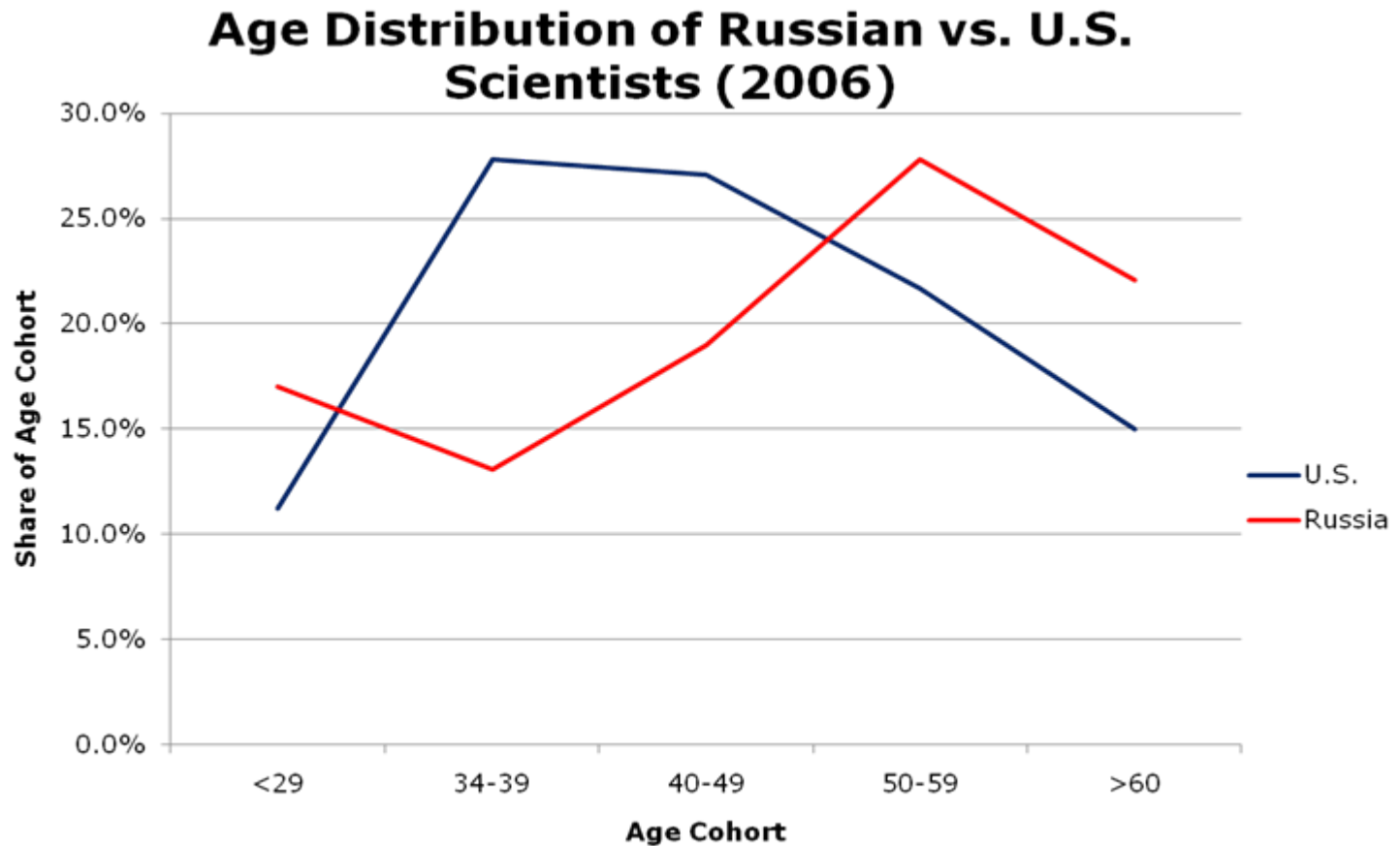
Age Structure of Russian Active Researchers



Age Structure of Russian Scientists: Total and in Russian Academy of Sciences (2008)



Russia-U.S. Scientist Age Comparison



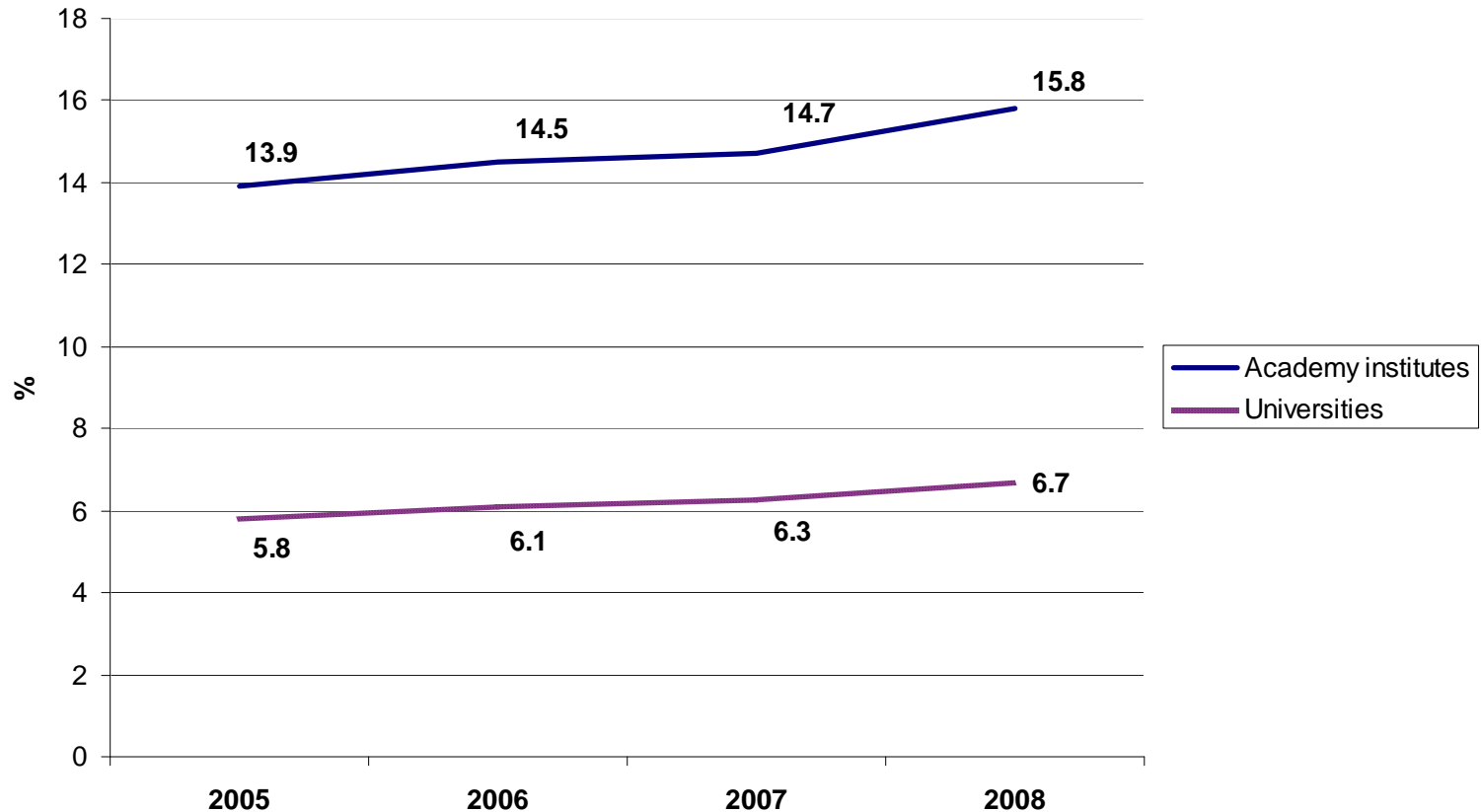
Organizational Changes in R&D Complex

- Preferential support of best universities (new status of “research university” was given in 2009 to 14 Russian universities; 16 more expected in 2010).
- Creation of “Federal universities” by joining several higher educational institutes.
- Creation of “national research centers” by uniting several organizations under one “umbrella” (Kurchatovsky institute in 2009; 5-7 more in the nearest future).
- Postponed reform of R&D organizations in the government sector of science (including Russian Academy of Sciences). Still over 73% R&D organizations (including universities) are government-owned or controlled.

Organizations Conducting R&D

	2005		2006		2007		2008	
	#	% of total	#	% of total	#	% of total	#	% of total
Academy institutes	837	23.5	851	23.5	891	22.5	865	23.7
Universities	406	11.4	417	11.5	500	12.6	503	13.7
Total organizations conducting R&D	3,566	100	3,622	100	3,957	100	3,666	100

Universities and Academy Institutes, by Share of Financing, % to the Total



New Presidential Priorities in Technology Development

In June 2009 President Medvedev announced new priorities of “Technological Breakthrough”:

- Energy efficiency
- Nuclear technologies
- Space technologies including telecommunications
- Medical equipment
- Strategic information technologies including supercomputers

Government agencies, foundations, state corporations and Academies are reorienting to these priorities. RAS: 23% of financing in fundamental research is within 5 priority areas; may be increased by 35%. Russian Foundation for Basic Research – 14%.

Financing of R&D by Government Priority Areas, % to the total

	2006	2007	2008
Transport, aviation and space systems	56.8	51.6	46.8
Information and communication technologies	14.9	15.6	15.4
Energy and energy saving	7.9	8.1	10.0
Rational use of nature	7.1	7.9	9.3
Nanotechnology	4.5	7.1	7.4
Life sciences	3.5	4.2	4.2

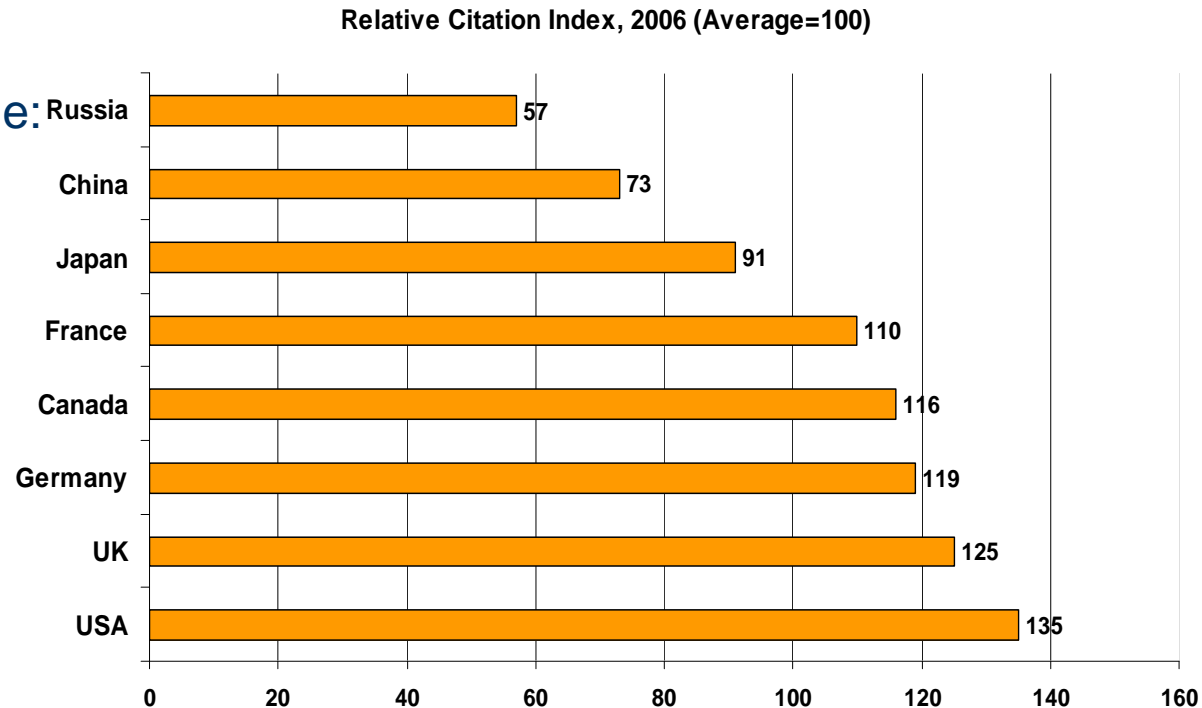
Government Approach to Impact Assessment

- President stated that one of the major indicators to measure quality of research and of organizations should be the citation index.
- Impact-factor and citations will be used in evaluation of government R&D organizations' performance; educational-research centers' performance.
- Number of publications and citations index will be core indicators to judge foreign scholars wishing to work in Russia.
- Bibliometrics is used by RUSNANO in the process of selection of experts for projects evaluation.

Publication Output: Russia and the World

Total Share of Publications
for the Last 5 years, average:

- **Russia 2.6%**
- Brazil 2.1%
- India 2.9%
- China 8.4%
- USA more than 25%



Russian Publications by Field

	Share in total world publications, %	
	1999-2003	2004-2008
Physics	9.68	7.39
Space Research	7.66	6.90
Earth Sciences	8.07	6.76
Chemistry	6.15	4.87
Mathematics	5.68	4.63
Material Science	4.73	3.28
Engineering	3.84	2.30
Molecular Biology	2.48	1.97
Clinical Medicine	0.70	0.62

Recent Institutional Changes

- State corporations (RUSNANO; Russian Technologies; ROSATOM, etc.) play growing role in innovation policy setting and implementation.
- New legal environment for commercialization: the new law allowing universities and R&D institutes to found small innovative companies came into force on August 2, 2009.
- New forms of support to small innovative companies
 - Seed Fund is under creation at Russian Venture Company - RVC;
 - new grant program to support R&D at start-ups in universities initiated by Fund for Assistance;
 - infrastructural projects under consideration in RUSNANO and RVC.

Comparative Investments in Nanotechnologies (2008)

(Source: Spanish analytical information company «*Cientifica*»)

Country	Billion current USD	Billion USD, Purchasing Power Parity equivalent
Russia	1.00	2.11
China	0.51	2.03
USA	1.82	1.82
Japan	1.13	1.00

Russian Corporation of Nanotechnologies

Government has released 130 billion rubles (4.8 billion USD) in 2007 – till 2015

Tasks of the Corporation:

- 1) investment in developing nanoindustry production, forming markets for nano-production (investment projects);
- 2) financing infrastructural programs in nanotechnologies, work on standardization, certification and metrological guarantee, providing safety in nanoindustry;
- 3) financing projects in education, the promotion of science, and the advance of Russia as one of the world centers of nanoindustry.
- 4) Main requirement – production should be located in Russia.

Activity of RUSNANO (as of February, 2010)

- Corporation receives currently about 100 applications and proposals per month.
- Total the Corporation has received 1356 applications – requests to finance projects in nanotechnologies. Out of these 64 are close to start.
- 38 projects are under implementation.
- Slow start: in 2008 RUSNANO invested in projects 1 billion rubles instead of planned 8 billion rubles.

Difference Between Russian and the U.S. Nanotechnology Initiatives

- Degree of centralization: RUSNANO is “picking winners” and tries to control the field. U.S.: government is not the major actor; it is combined with activity of private venture capital effort.
- Business involvement: low in Russia.
- Handling regulatory and health issues that nanotechnology raises: poor in Russia.
- Commercial potential: USA – 19865 patents in nanotechnology (as of September 1, 2009); Russia – less than 800.

Conclusions (1)

- Government announces innovation development as a priority:
 - financing for R&D from the federal budget was increasing
 - new technological priorities were set by the President
 - new institutions established
 - variety of initiatives aimed to improve the situation in the R&D complex initiated.
- However the policy and reforms may be characterized as near-term and half-hearted. None of the measures was fully implemented and evaluated.

Conclusions (2)

- Growing financing is distributed through no effective mechanisms.
- Human resources policy is focused on selected groups of researchers and in absence of organizational reforms is not very fruitful.
- Short-sighted government vision affects the behavior of business enterprises. They continue to be a passive actor of innovation system.