

# Croatian national innovation system - SWOT analysis

Innovation Policy Learning from Norway in Western Balkans (WBinNO)

**Sarajevo Workshop**

Zoran Aralica and Denis Redžepagić

4-6 June 2012, School of Economics and Business, Sarajevo

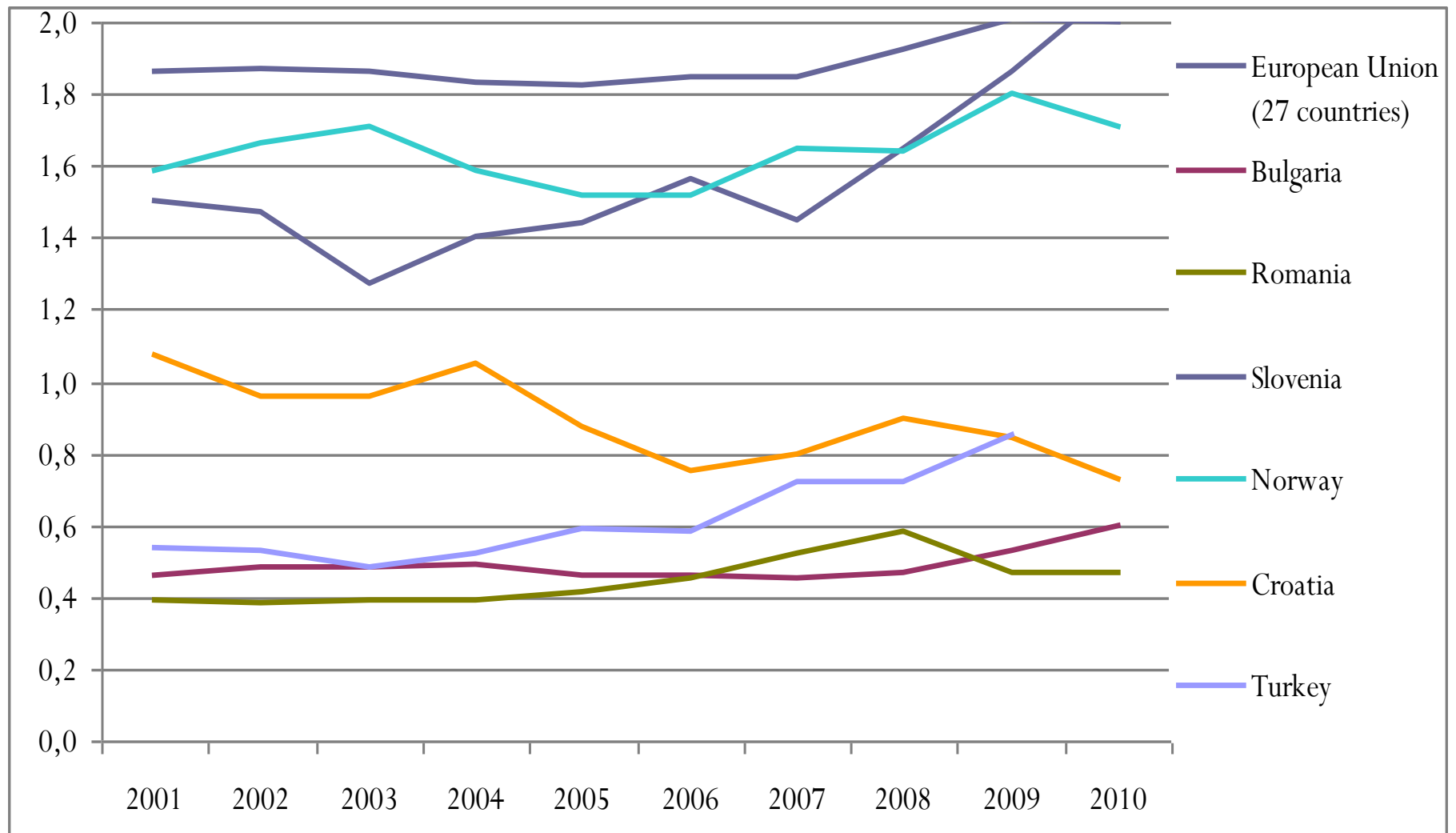
# Contents

1. Macroeconomic Framework
2. Science and research inputs into the innovation process
3. Innovation outputs
4. Innovation infrastructure networks and technology transfer
5. Institutional arrangements and policies
6. SWOT Analysis

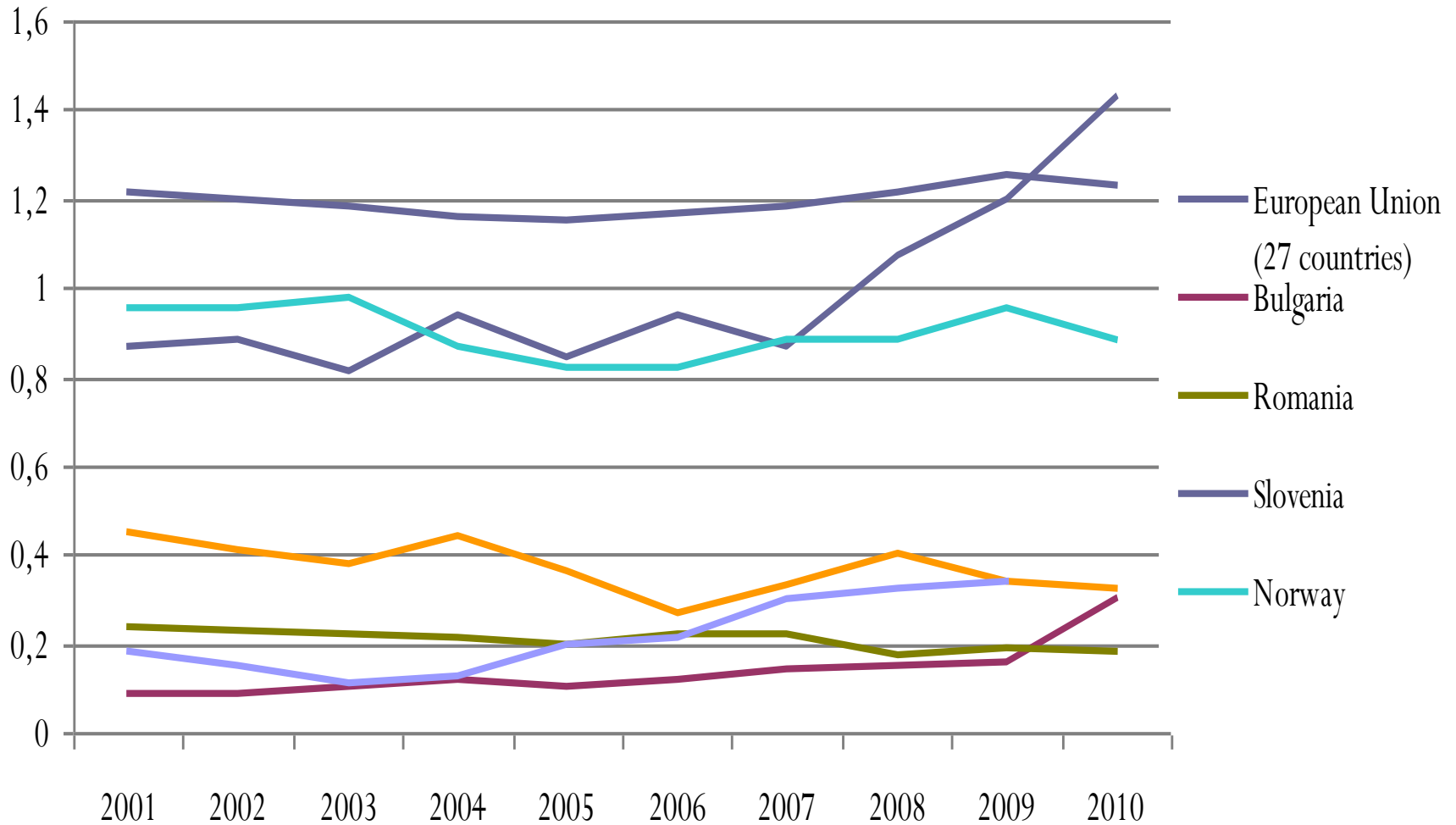
# Macroeconomic model affects on the science and technology sector

	<b>2000.</b>	<b>2008.</b>	<b>2009.</b>
GDP/capita, (EUR at exchange rate)	5200	10700	10100
Population	4497735	4436401	4435056
GDP, real change in %	3.8	2.2	-6
Unemployment rate, reg., % average	16.1	8.4	9.1
Gross fixed capital form. (EUR mn, nom)	4359.6	13052.5	11207.3
Manufacturing Gross Value Added as a percent of GDP, %	17.6	9.3	9.2
Exports of goods, EUR, mn	4976.5	9814.0	7690.5
Import of goods, EUR, mn	8468.7	20607.8	15088.5
Exports of services	4442.0	10090.6	8453.9
Imports of services	1971.5	3132.7	2778.3
FDI inflow, EUR mn	1140.6	4195.4	2096.0
FDI outflow, EUR mn	5.0	988.8	918.7
Total expenditure on R&D as percentage of GDP	1,23	0.9	0.84

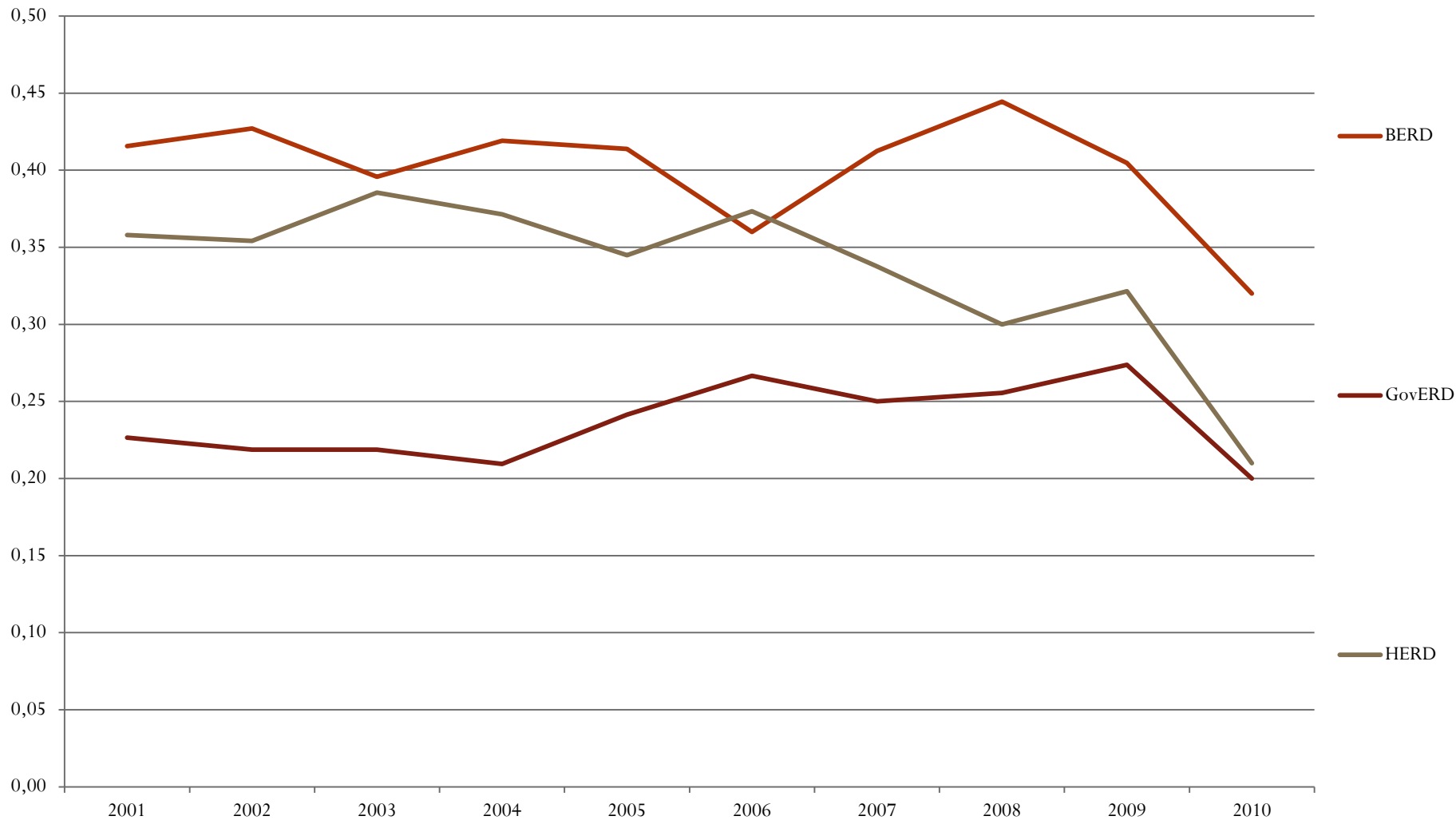
# Gross expenditure on research and development (% GDP) during the period 2001-2010



# Business expenditure on research and development (% GDP) during the period 2001-2010



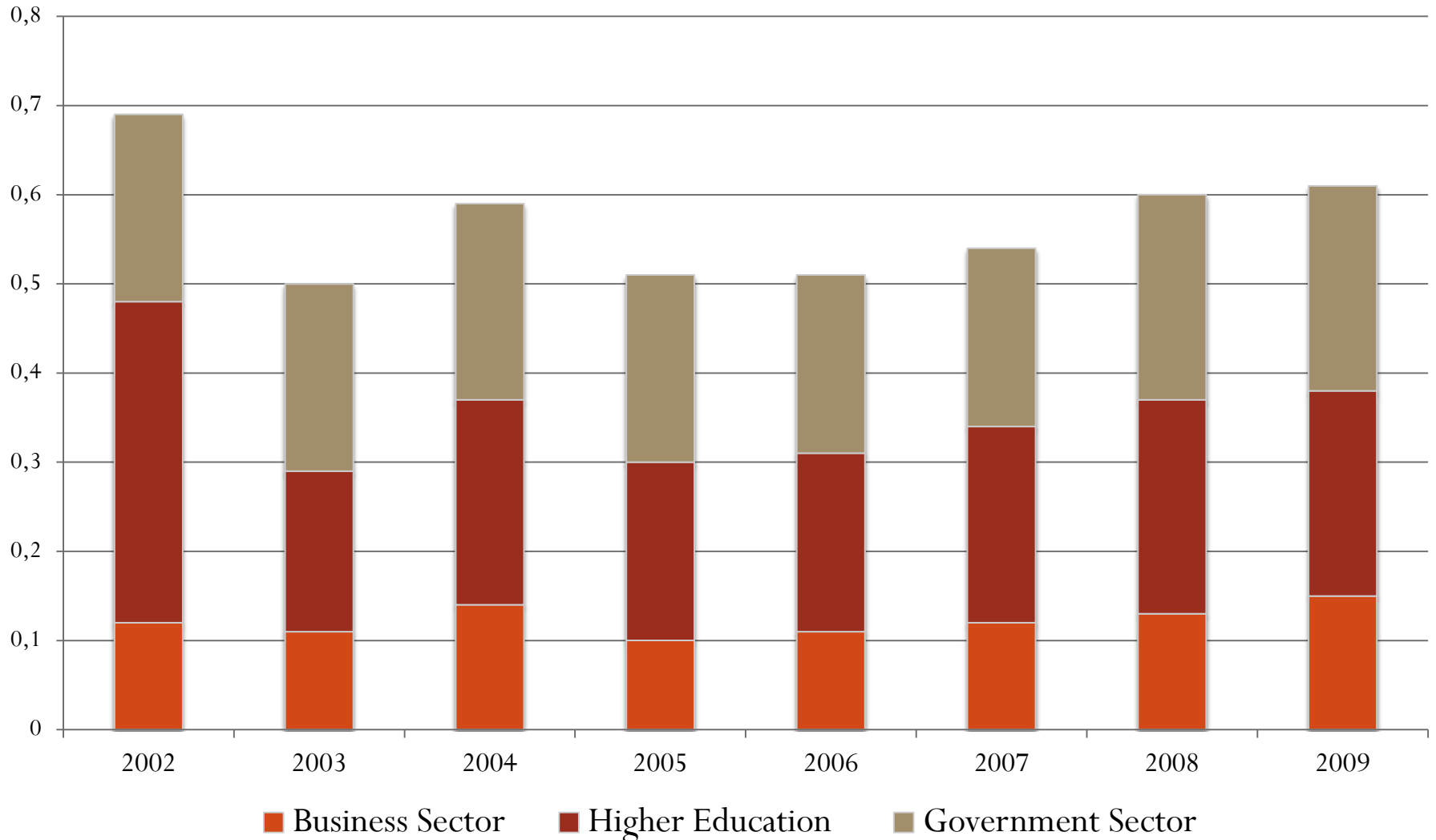
# The structure of the research and development activities as a percentage of GDP during the period 2001-2010



# Croatia vs. the EU main education indicators during the period 2007-2009

	2007		2008		2009	
	Croatia	EU - 27	Croatia	EU - 27	Croatia	EU - 27
Annual expenditure on public and private educational institutions compared to GDP per capita	24.9	24.9	26.4	25.6	N.A	N.A
Science and technology graduates by gender	6.8	13.8	10.1	14.5	12.8	14.3
Total population having completed at least upper secondary education	75.3	70.7	75.9	71.4	76.8	72
Life-long learning by gender	2.4	9.4	2.2	9.4	2.3	9.3

# The structure of the research and development personnel (% of the labor force) during the period 2002-2009

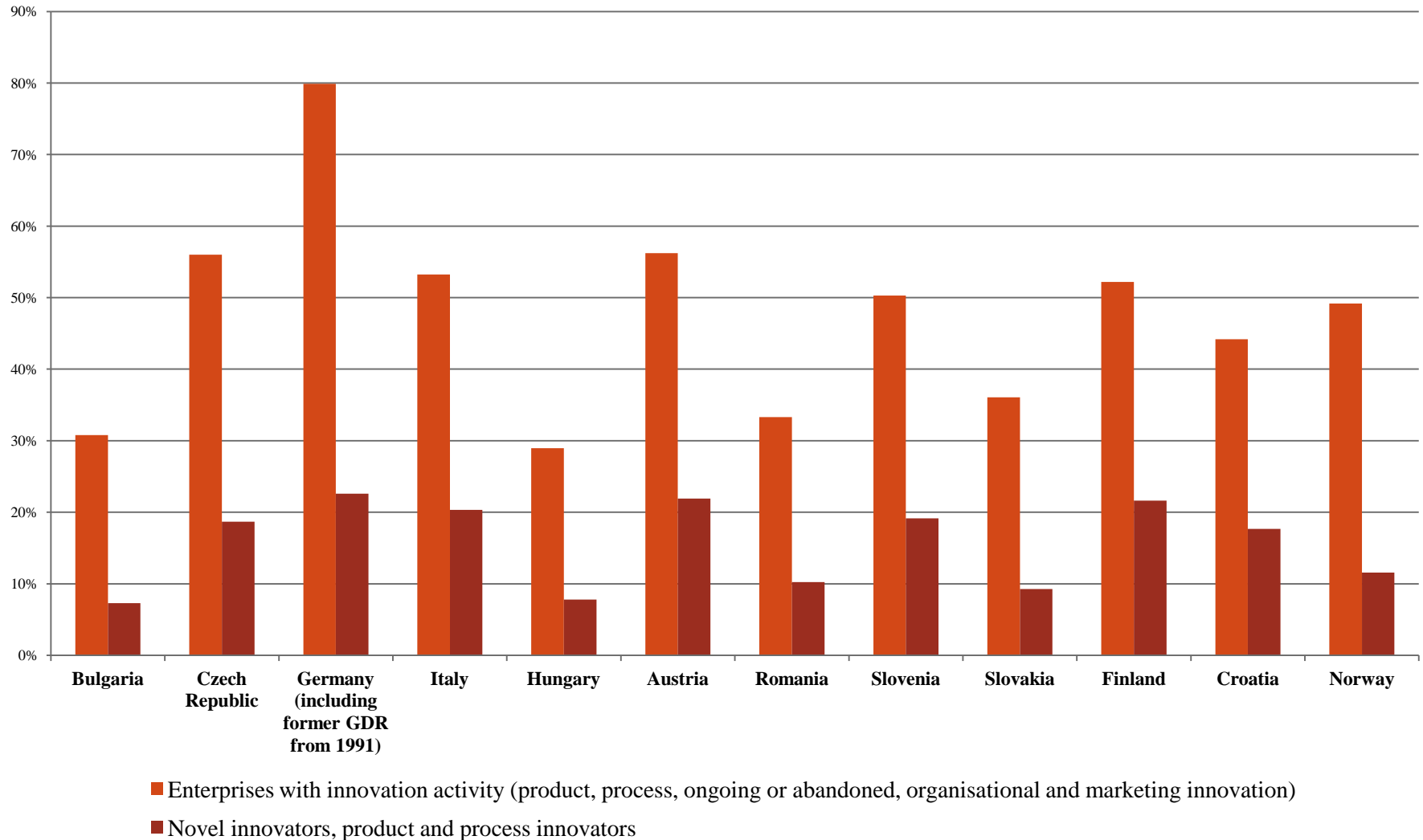




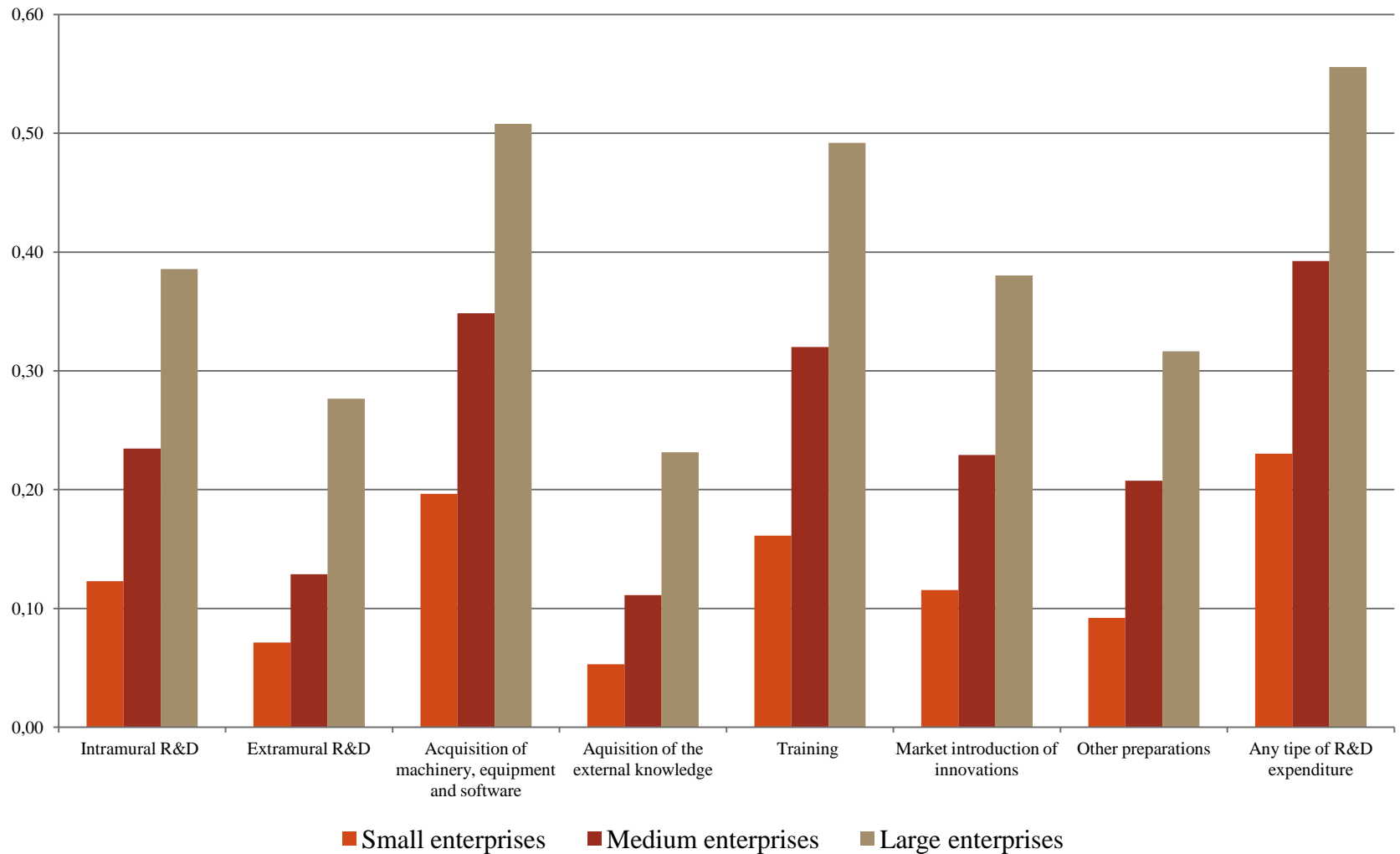
# R&D output in the selected countries in terms of high tech export, patent applications, and royalty and licences fees

	2008	2009	2008	2009	2008	2009
	High Technology Export (GDP current price)		Patent Applications (per capita)		Total royalty payments (per capita)	
Bosnia and Herzegovina	0.68	0.44	15.64	N.A	2.9	1.6
Bulgaria	1.46	1.47	43.29	32.96	12.5	15.5
Croatia	1.28	1.19	56.16	54.60	58.1	48.0
Romania	1.37	2.01	46.25	0.05	16.1	15.8
Slovenia	2.85	2.57	190.96	156.12	126.0	141.8
Serbia	N.A	N.A	4.07	4.99	26.5	19.6
Turkey	0.25	0.24	30.04	34.15	9.9	8.7
Norway	1.28	1.24	239.08	N.A.	16.1	114.5

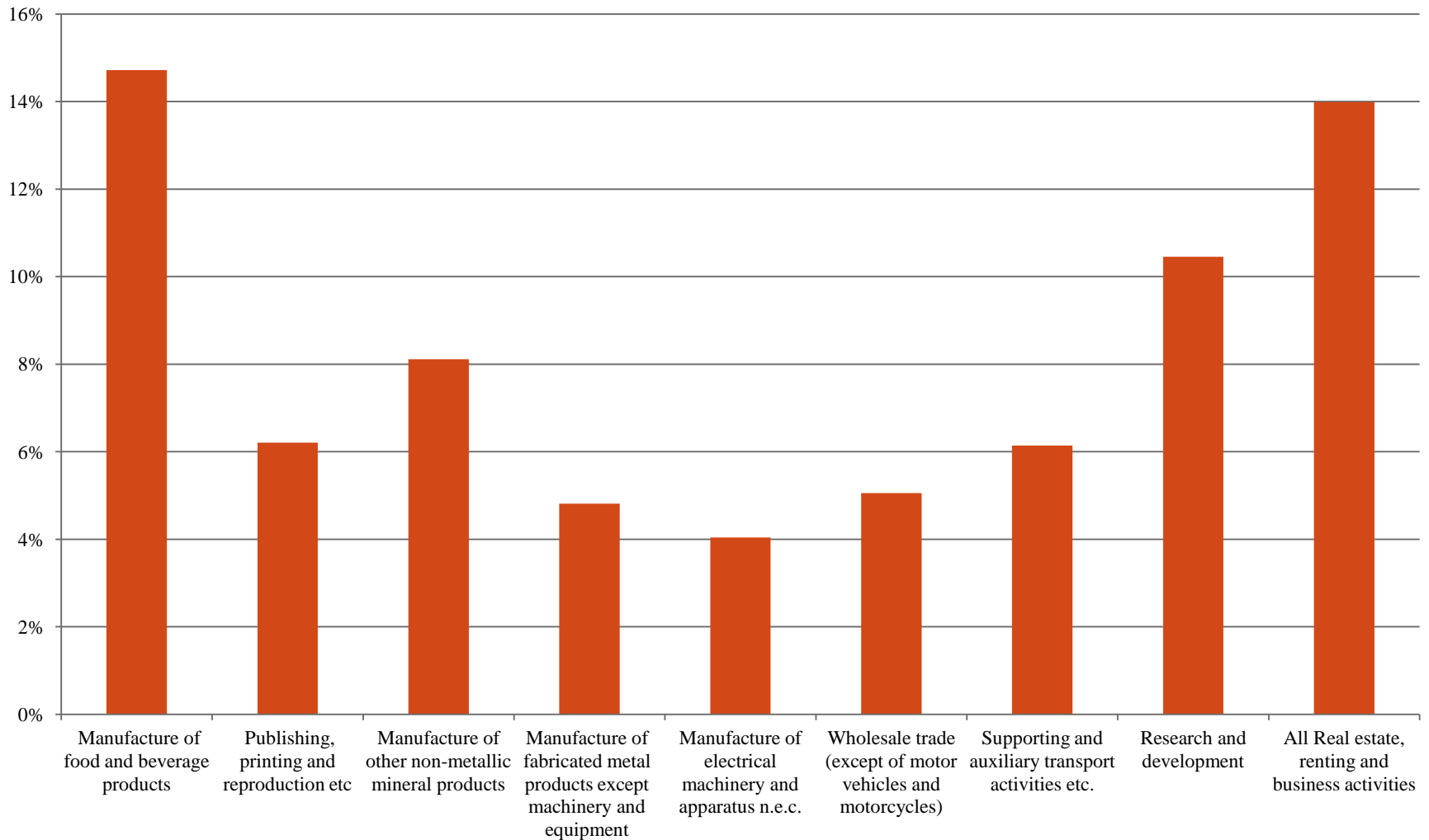
# Shares of enterprises with innovation activity and novel innovators in Croatia and selected countries



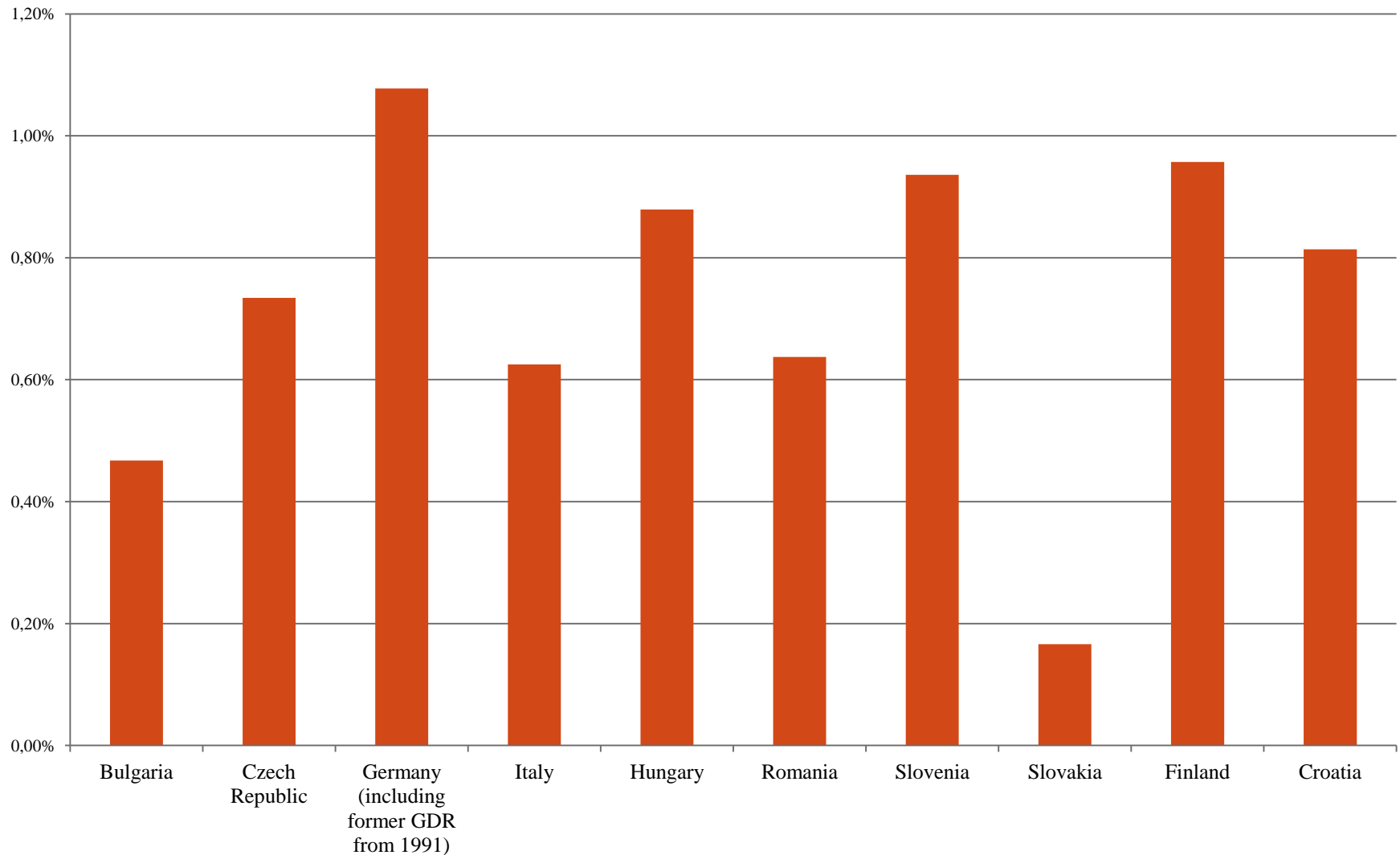
# Shares of enterprises with the innovation expenditure as % of total number of enterprises in the population in 2006



# Main economic activities sectors as % of total amount of innovation expenditure in 2006



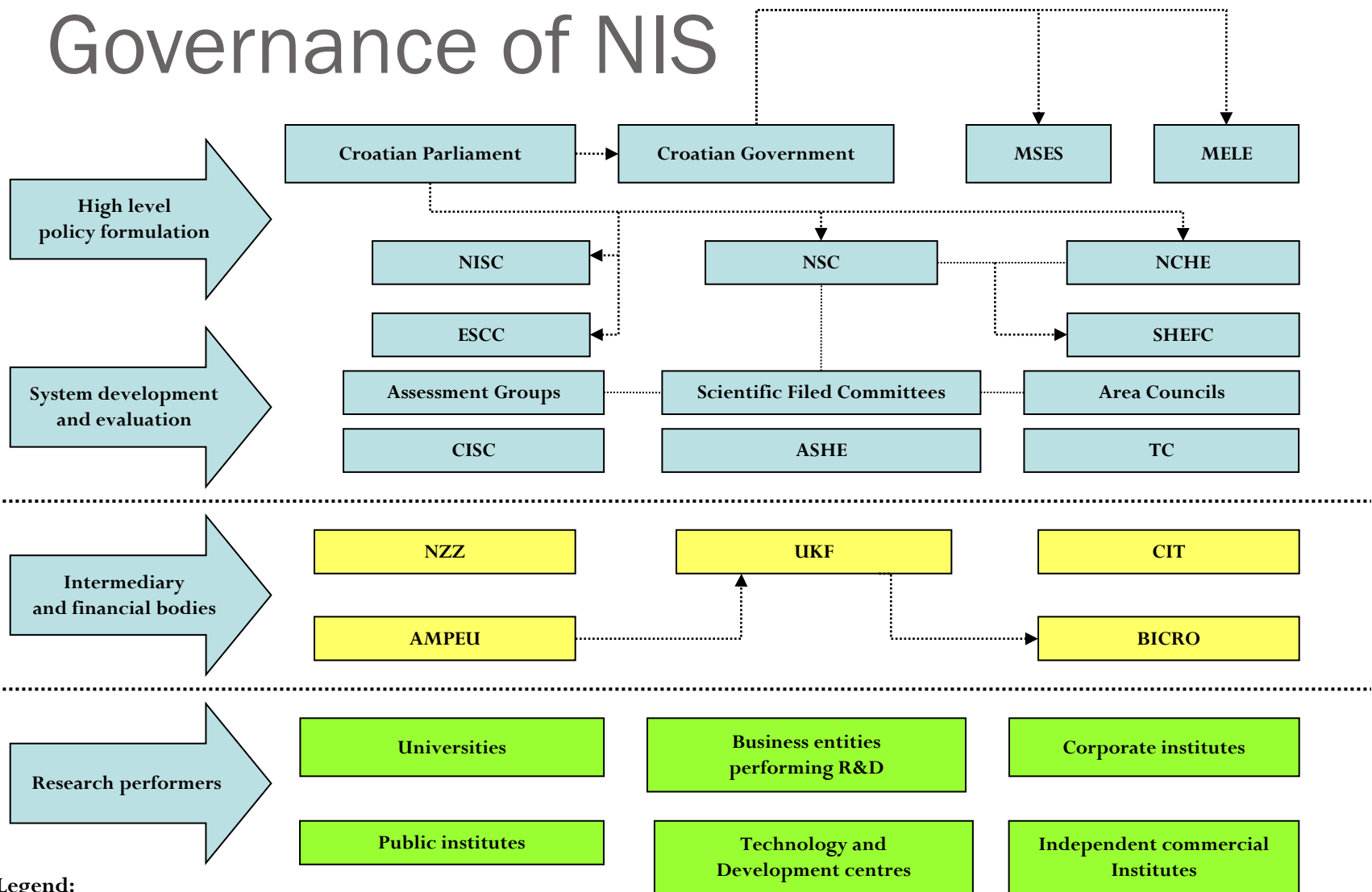
# Government and public institutions as highly important source of information for innovation during 2006-2008 (% of total number of enterprises in the population in 2006)



# National Innovation System

- Significant changes over the past 20 years
  - Major loss of capacities and human resources in 1990ties
  - Deindustrialisation – effect of transition and war
  - Major impulse from the Ministry of science, education and sports (S&T policy 2006-2010, Action plans)
  - Recently, two areas in focus: science and industry cooperation and human development within the science sector
  - Support programs and institutions established: HITRA, BICRO, HIT, UKF, AMMPEU
  - Currently, impact of EU funds, namely CIP-competitiveness and innovation

# Governance of NIS



## Legend:

MELE – Ministry of Economy Labour and Entrepreneurship

CISC – Croatian Innovation Systems Council

ASHE – Agency for Science and Higher Education

TC – Technological Council of MSES

CIT – Croatian Institute of Technology

UKF – Unity through Knowledge Fund

BICRO – Business Innovation Centre of Croatia

NZZ – National Foundation for Science, Higher Education and Technological Development

MSES – Ministry of Science, Education and Sports

NISC – National Information Society Council

ESCC – Education, Science and Culture Committee

NSC – National Scientific Council

NCHE – National Council for Higher Education

SHEFC – Science and Higher Education Funding Council

AMPEU - Agency for Mobility and EU programs

# New initiatives in the NIS system - 2012

- Competitive loans for innovations and R&D by HBOR and BICRO
- New **Business Innovation Agency** result of merging CIT and BICRO
- New World Bank loan (STP) **the Business Innovation Agency** R&D project with short of commercialization
- Ministry of Entrepreneurship - New SME programmes in 2012
  - 1) Development and application of innovation
  - 2) Standardization and quality marks
  - 3) Gazelles
  - 4) women Entrepreneurs
  - 5) Beginner entrepreneur
  - 6) Youth in Entrepreneurship
  - 7) Education for entrepreneurship



# New initiatives in the NIS system – 2012 (II)

- Ministry of regional development and EU funds:
  - CIP - Competitiveness and Innovation Framework Programme
  - CIP EIP - entrepreneurship and Innovation Programme
  - CIP ICT PSP - ICT Policy Support Programme
  - IEE - Intelligent Energy Europe

# SWOT analysis

## STRENGTHS

- Innovation policy experience via continuous projects since 2001.
- Established state support programs for innovation projects (MSES, MINECON, MINENT)
- Relatively complex institutional framework of the innovation system in the research and SME sector on the national level;
- stable R&D performers across sectors

## WEAKNESSES

- Declining share of total investments into R&D
- Insufficient innovation infrastructure enabling technology transfer to the SME sector
- Insufficient business sector R&D investments
- Human potential left unused (brain drain)
- Insufficient financial sources for MSE innovation processes
- Unsatisfactory IT use in the public sector

## OPPORTUNITIES

- EU accession an opportunity to increase innovation based competitiveness
- Regional cooperation as a competitiveness enhancing mechanism
- Increasing applicability of state sponsored research to increase competitiveness
- Inclusion of the research potential into the European Research Area
- Creation of work groups (cooperation of researchers and business sector) to clearly define the innovation policy goals and enable knowledge transfer

## THREATS

- No culture of ex ante and ex post culture in policy monitoring and improvements
- Relatively small research community insufficient to intensify cooperation with the industrial sector
- No institutional environment fostering cooperation between the research community and industry
- Insufficient knowledge of EU standards

# Policy development guidelines

- Short Term

- Evaluation (ex ante and ex post) policy
- Capacity building

- Medium – long term

- Strengthening Collaboration – Communication – Dissemination
- Supranational – National – Local