



EUROPEAN SCIENCE POLICY

(CHALLENGES AND EXPECTATIONS)

NORBERT KROO
HUNGARIAN ACADEMY OF SCIENCES
AND THE EUROPEAN RESEARCH COUNCIL

IT STAR, 11.11.2006

GROWING SIGNIFICANCE OF KNOWLEDGE

KNOWLEDGE BASED SOCIETY (ECONOMY)

→ INNOVATION ORIENTED SOCIETY

RESOURCES (LABOUR, MATERIALS, ENERGY, CAPITAL,
KNOWLEDGE). SCIENTIFIC KNOWLEDGE!

(danger to treat knowledge as a tradable commodity)

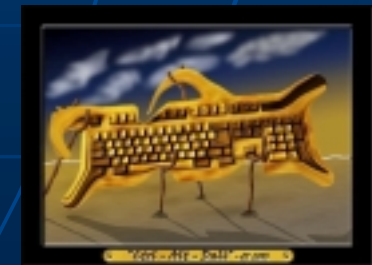
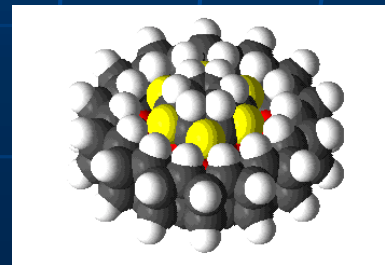
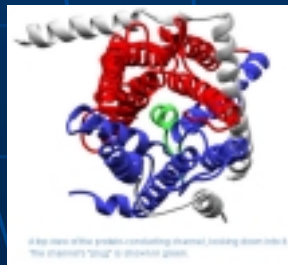
NEW PRACTICES IN RESEARCH (multidisciplinary, groups)

NEW PRIORITIES (sustainable devel., jobs, competitiveness)

DRIVING OUT TECHNOLOGIES

NEW POTENTIAL REVOLUTIONS (BIO-, NANO-, INFO-TECHNOLOGIES)

GLOBALIZATION. CRITICAL SIZE. INTERNATIONAL COOPERATION





R&D AS THE KEY TO (EUROPEAN) COMPETITIVENESS AND NEW (HIGH TECH.) JOBS

THE NEED FOR INCREASED RESEARCH POTENTIAL

HUMAN CAPITAL (700,000 NEW RESEARCH POSITIONS)

PROPER INFRASTRUCTURE (incl. IT). LARGE FACILITIES.

STRONG (BASIC) RESEARCH BASE (G.W. Bush)

ERC (excellence – competition on European level)

HIGHER R&D SPENDING

APPROPRIATE INSTITUTIONAL SYSTEM

IMPROVED ACADEMIA - INDUSTRY RELATIONS

BETTER SCIENCE - SOCIETY RELATIONS



EUROPEAN TRADITIONS

MANY (100 YEAR, 30 YEAR, 1. AND 2 WORLD) WARS

RENAISSANCE

ENLIGHTENMENT

GALILEI, KEPLER, NEWTON, MAXWELL,...

INDUSTRIAL AND AGRICULTURAL REVOLUTION

THE CRADLE OF MODERN SCIENCE

RESPONSIBILITY OF OUR GENERATION!

SKILLS IN INTERNATIONAL COOPERATION!

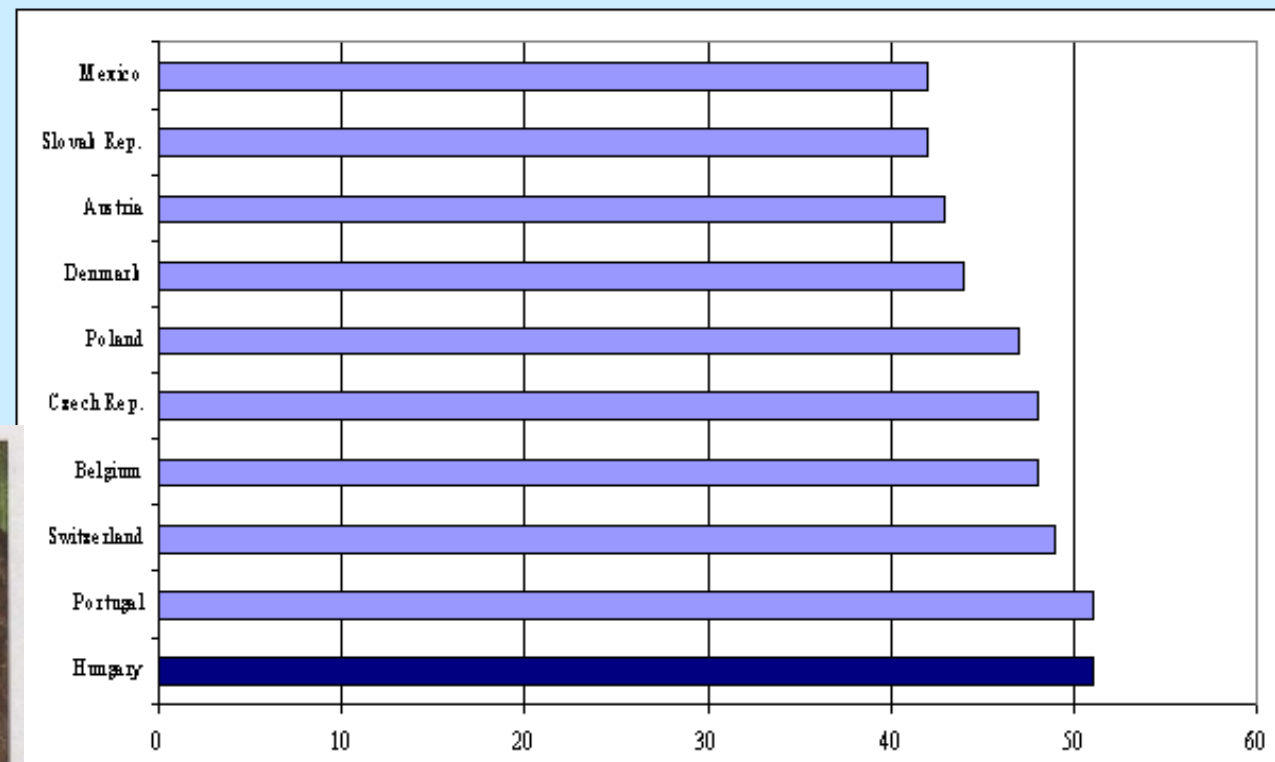
TRADITIONAL UNIVERSITY SYSTEM

BOLOGNA (drives universities to be more manageable)



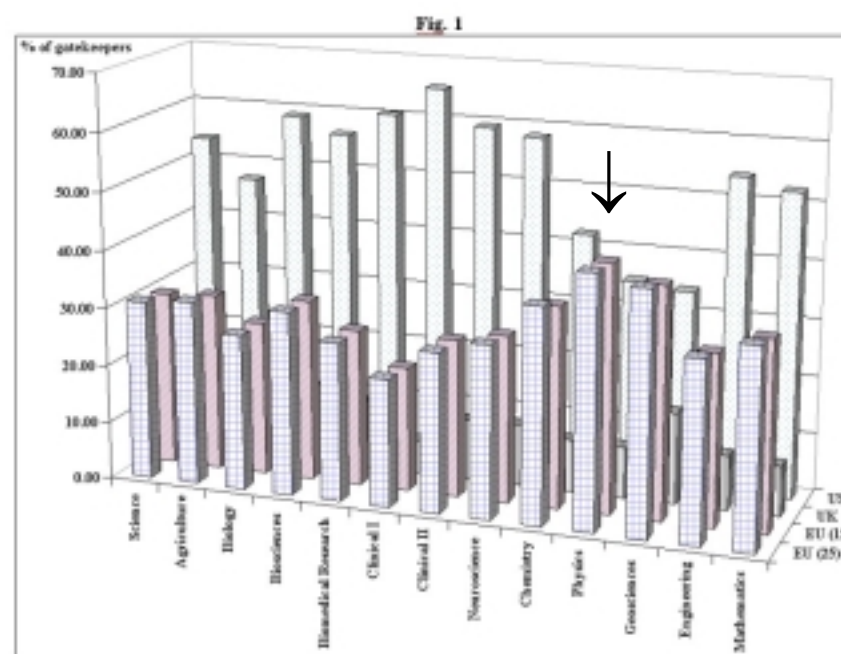
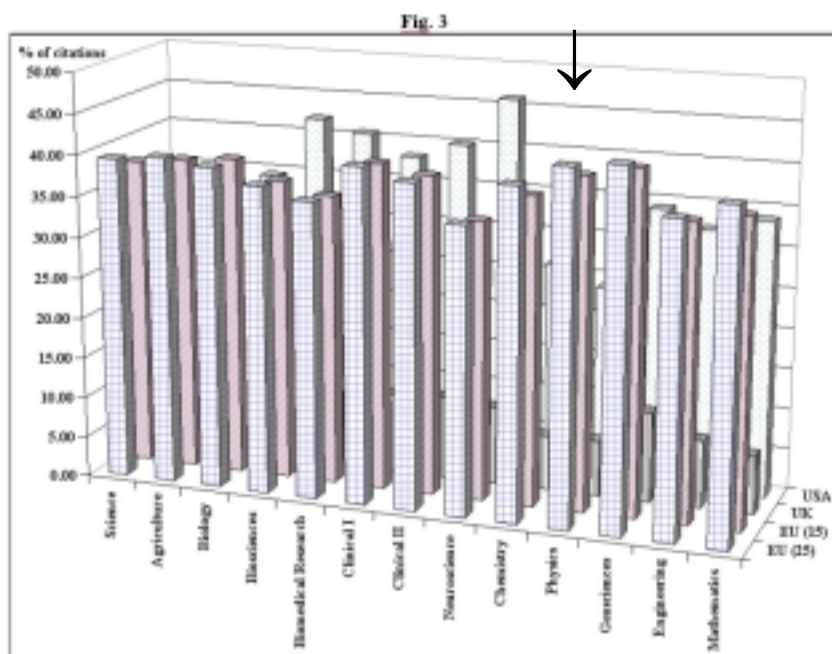
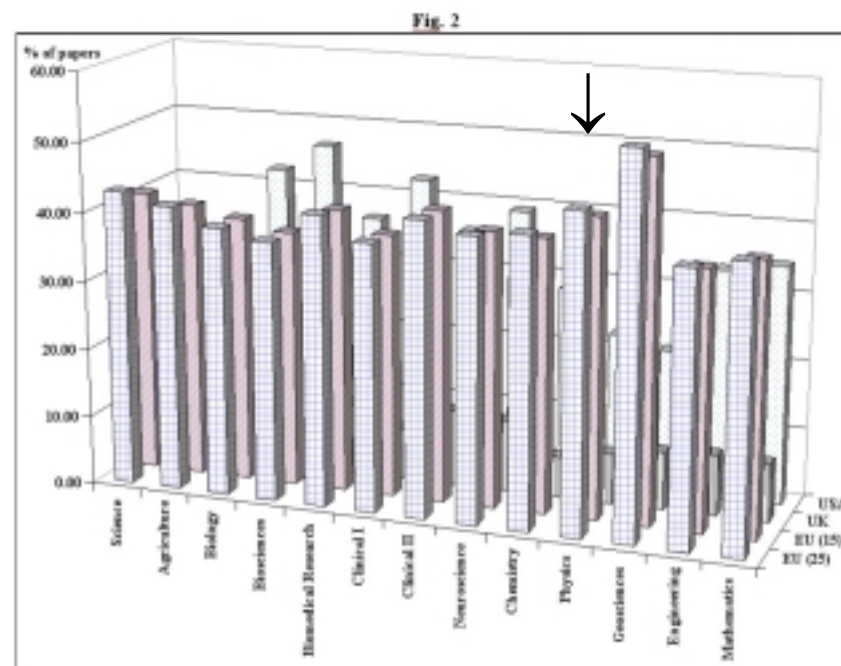
INTERNATIONALIZED RESEARCH

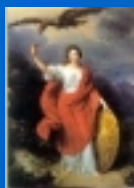
Share of scientific publications with a foreign co-author, 1995-97





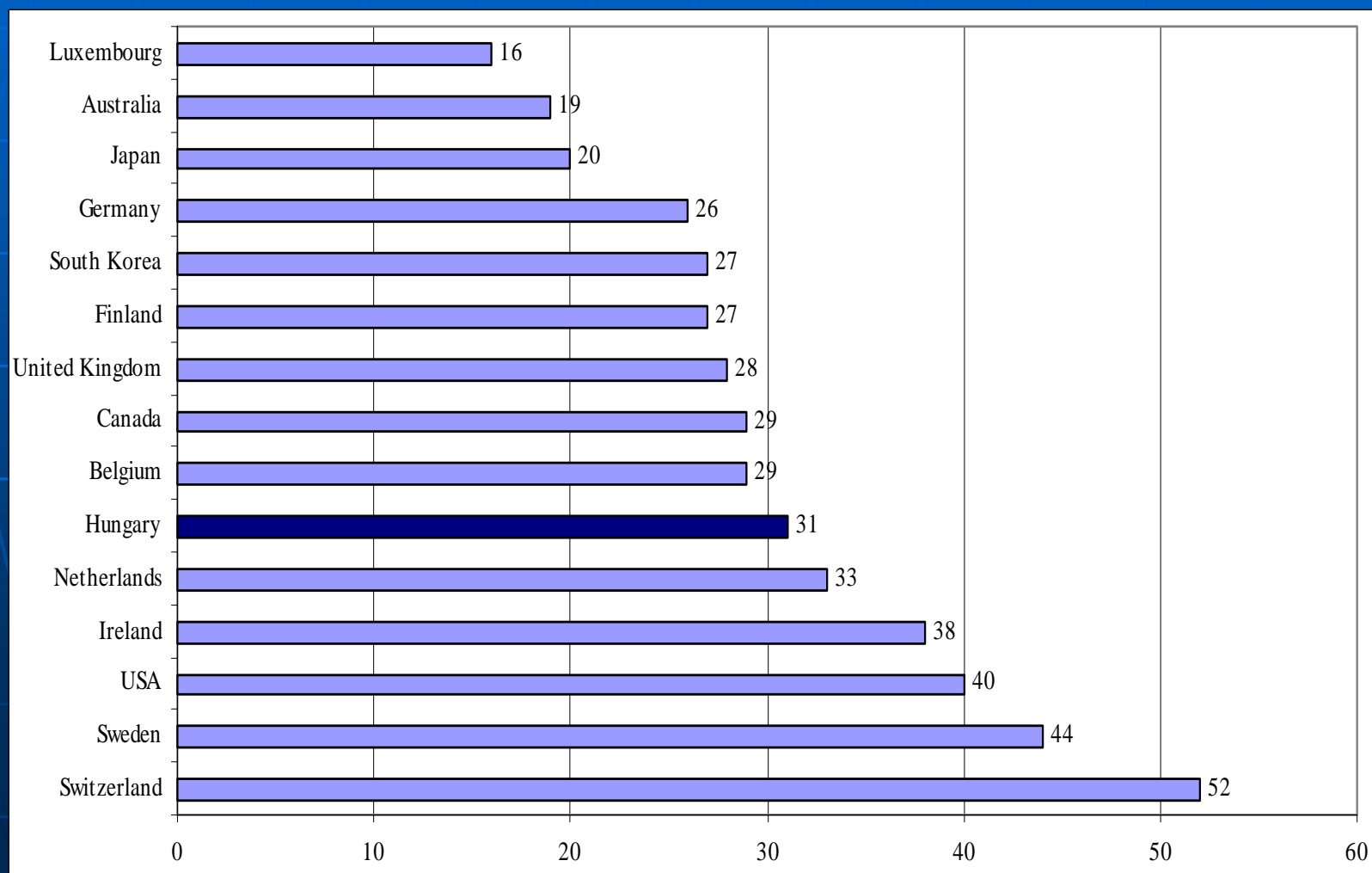
EUROPEAN PRESENCE ON THE PUBLICATION „MARKET”



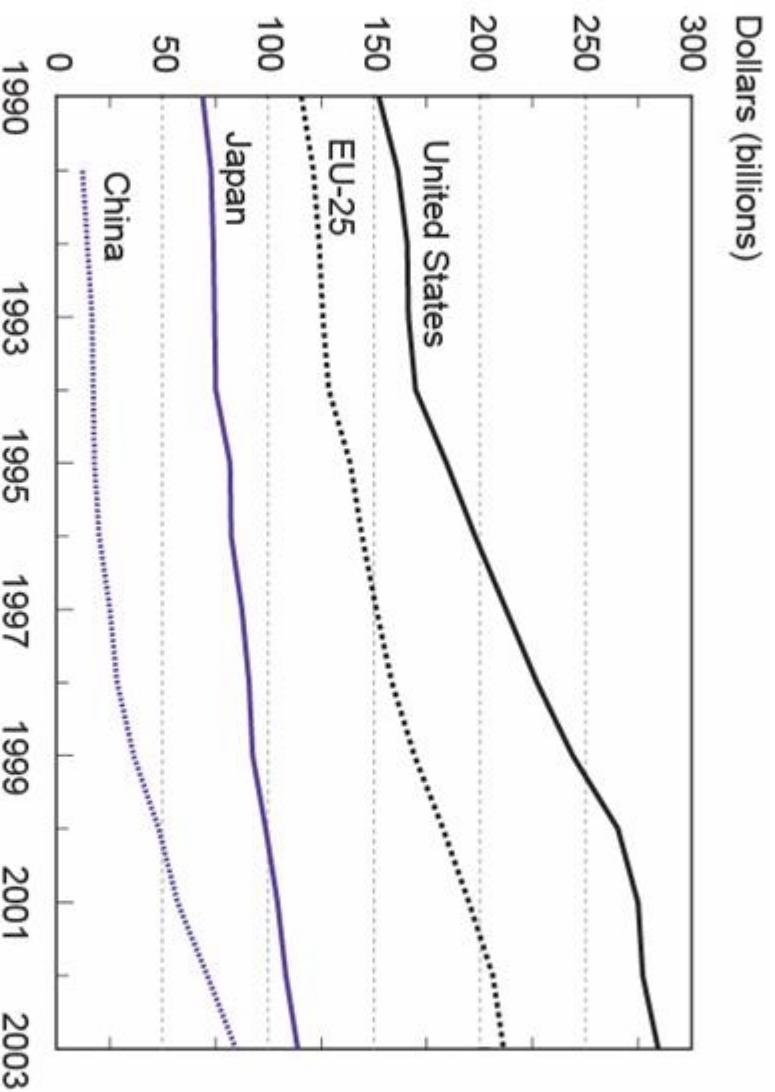


HUNGARIAN ACADEMY
OF SCIENCES

KNOWLEDGE BASED ECONOMIES



R&D expenditures of selected region and countries: 1990–2003



EU = European Union

NOTES: All data calculated by Organisation for Economic Co-operation and Development (OECD) with purchasing power parities. Data differ somewhat from U.S. dollar figures. EU-25 is EU-15 plus 10 new member states.

SOURCE: National Science Board, *Science and Engineering Indicators 2006*





1.THE KNOWLEDGE PARADOX

**THE SIGNIFICANCE OF SCIENCE INCREASES (1) AND THE
INTEREST OF THE YOUNG GENERATION DECREASES (2)**

AD 1. MULTIDISCIPLINARY DEVELOPMENT OF SCIENCE

INTERACTION WITH THE ECONOMY

SHORTER AND NONLINEAR INNOVATION CHAIN

KNOWLEDGE AS ECONOMICAL DRIVING FORCE

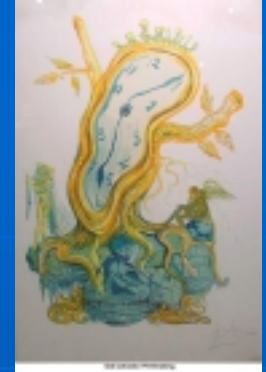
SIGNIFICANT SHARE OF SCIENTIFIC KNOWLEDGE

SKILLS APPLICABLE IN OTHER AREAS

AD 2. HARD WORK WITH MODEST FINANTIAL REWARDS

MANY OTHER CAREER PATHS

„PROBLEMLESS” CURRICULI IN HIGH SCHOOLS



2.THE TIME PARADOX

**THE TIME NEEDED TO ACQUIRE KNOWLEDGE INCREASES AND THE
OBSCOLESCENCE TIME OF IT DECREASES**

POSSIBLE INSTRUMENTS FOR SOLUTION:

COMBINATION OF LEARNING AND WORK

the role of research institutions and industry

THE ROLE OF INTERNATIONAL INFRASTRUCTURES

life abroad, family problems; most experience in physics

LIFE-LONG LEARNING

NEW LEARNING TECHNOLOGIES BASED ON INTERNET



3.THE EUROPEAN INNOVATION PARADOX.

GOOD RESEARCH, LOOSING GROUND IN COMPETITIVENESS

**NATIONAL SCIENCE POLICIES NOT IN HARMONY. LOW SPENDING
ON R&D**

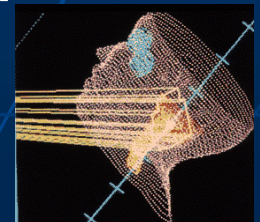
FRAMEWORK PROGRAMMES (competitiveness motivated)

LISBON (KNOWLEDGE BASED ECONOMY – ERA)

**ERA (HARMONIZED SCIENCE POLICY AND INFRASTRUC-
TURE, MOBILITY, FINANCES, ARTICLE 169, NETWORK
OF CENTRES OF EXCELLENCE, ...) STRUCTURAL FUNDS!**

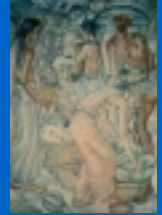
BARCELONA (3%).

INFORMATION SOCIETY PROGRAMMES





4.THE COMPETITIVENESS PARADOX



**THE ROLE OF R&D IN COMPETITIVENESS INCREASES BUT
DECISIONMAKERS ARE TEMPTED TO FORGET ABOUT IT**

**EDUCATION. POPULARIZATION. LOBBYING (POLITICS, BUSINESS
WORLD)**

HOW THE ECONOMY PROFITS FROM RESEARCH?

RESULTS OF BASIC RES. GET RIPE FOR APPLICATIONS

RESEARCH FOR GENERAL GOALS (CANCER)

**RESEARCH FOR CONCRETE GOALS (HIGH SPEED
COMMUNICATION NETWORKS)**

BYPRODUCTS OF BASIC RES (WWW, LANDING ON MOON)

CONTRACTS FOR COMPANIES (ACCELERATOR MAGNETS)



WEAK POINTS OF EUROPEAN RESEARCH

1. WEAK COOPERATION ALONG STRATEGIC PRIORITIES
2. FRAGMENTED RESEARCH
3. LACK OF FINANCES FOR TRAINING, MOBILITY AND RESEARCH
INFRASTRUCTURE
4. LACK OF SCIENTIFIC-TECHNOLOGICAL COHESION
5. LOW VOLUME OF EXCELLENT RESEARCH AND SMALL NUMBER OF
EXCELLENT RESEARCH TEAMS
6. NEGLECT OF EU LEVEL ATTENTION ON BASIC RESEARCH



ACTIONS NEEDED (1)

Ad 1. COOPERATION IN THEMATICALLY ORIENTED STRATEGIC RESEARCH PROGRAMMES

- integrated programmes,
- networks of Centres of Excellence,
- STREPS

Ad 2. THE COORDINATION OF NATIONAL RESEARCH PROGRAMMES (ERA—net, ERA-NET plusz, 169.§)

ARGUMENTS TO DECREASE FRAGMENTATION: limits

- the flexible career paths of young researchers,
- cross border cooperation,
- cross border financing,
- mutual learning,
- to reach the critical mass (small countries!)



ACTIONS NEEDED (2)

- the integration of new members,
- the realization and evaluation of EU level best practices,
- the strengthening of Centres of Excellence, and increase of their number.

Ad 3. INCREASE OF THE RESEARCH CAPACITY

(human capital, mobility, infrastructure)

- national 3% and a significant increase of the finances of FP7
- resolve the contradiction between national financing (~95%) and international research

Ad 4. EUROPEAN TECHNOLOGICAL PLATFORMS (with industry)

Ad 5. CURIOSITY DRIVEN BASIC RESEARCH PROGRAMMES (ERC)

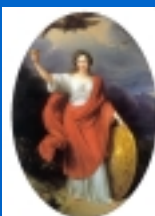
BASED ON EXCELLENCE



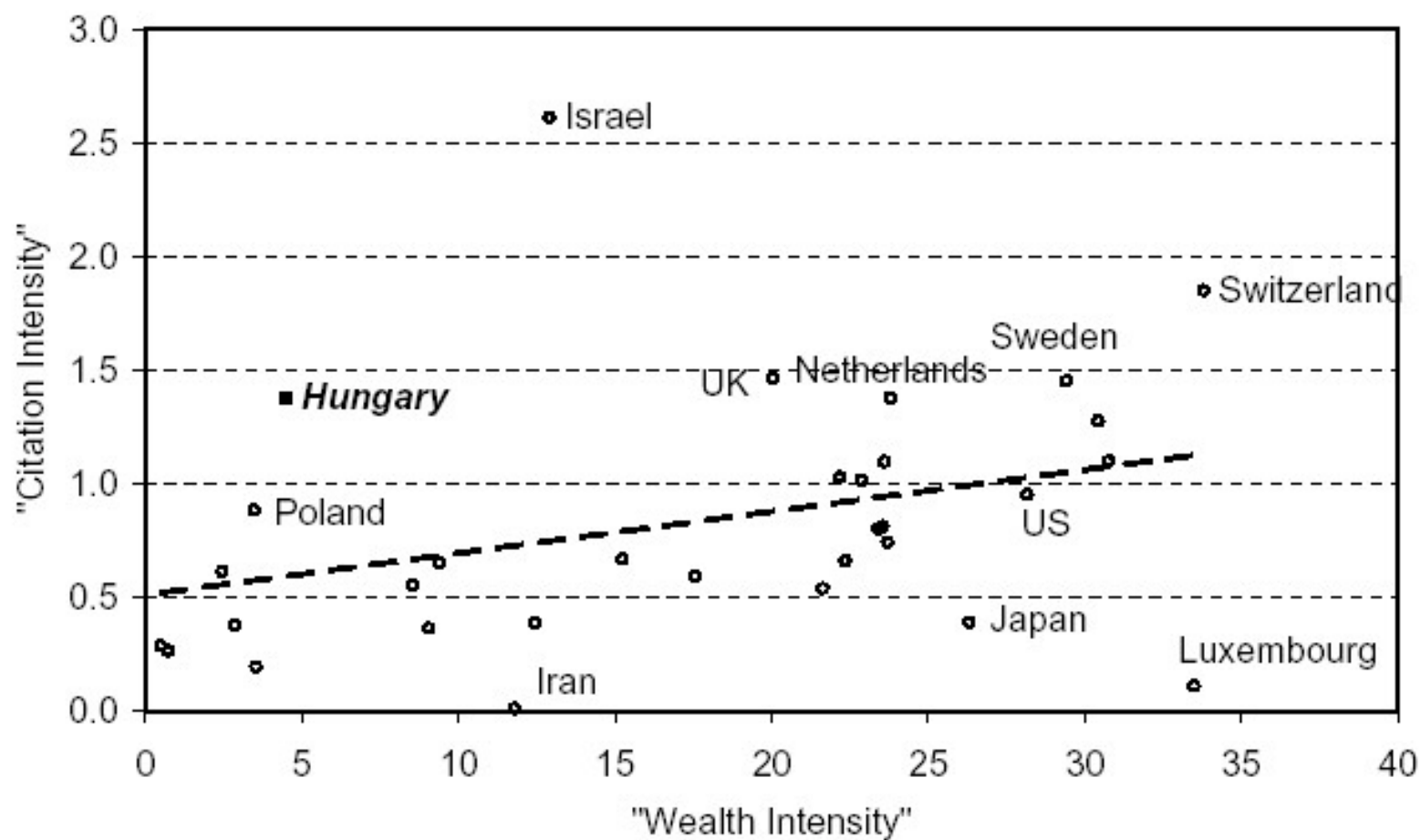
ACTIONS NEEDED (3)

**Ad 6. COMPETITION ON EUROPEAN LEVEL IN BASIC
RESEARCH SHOULD LEAD TO HIGHER QUALITY
AND WILL BE THE BASIS ON LONG TERM OF
EUROPEAN COMPETITIVENESS**

**EUROPEAN RESEARCH COUNCIL
(FRONTIER RESEARCH; IDEAS)**



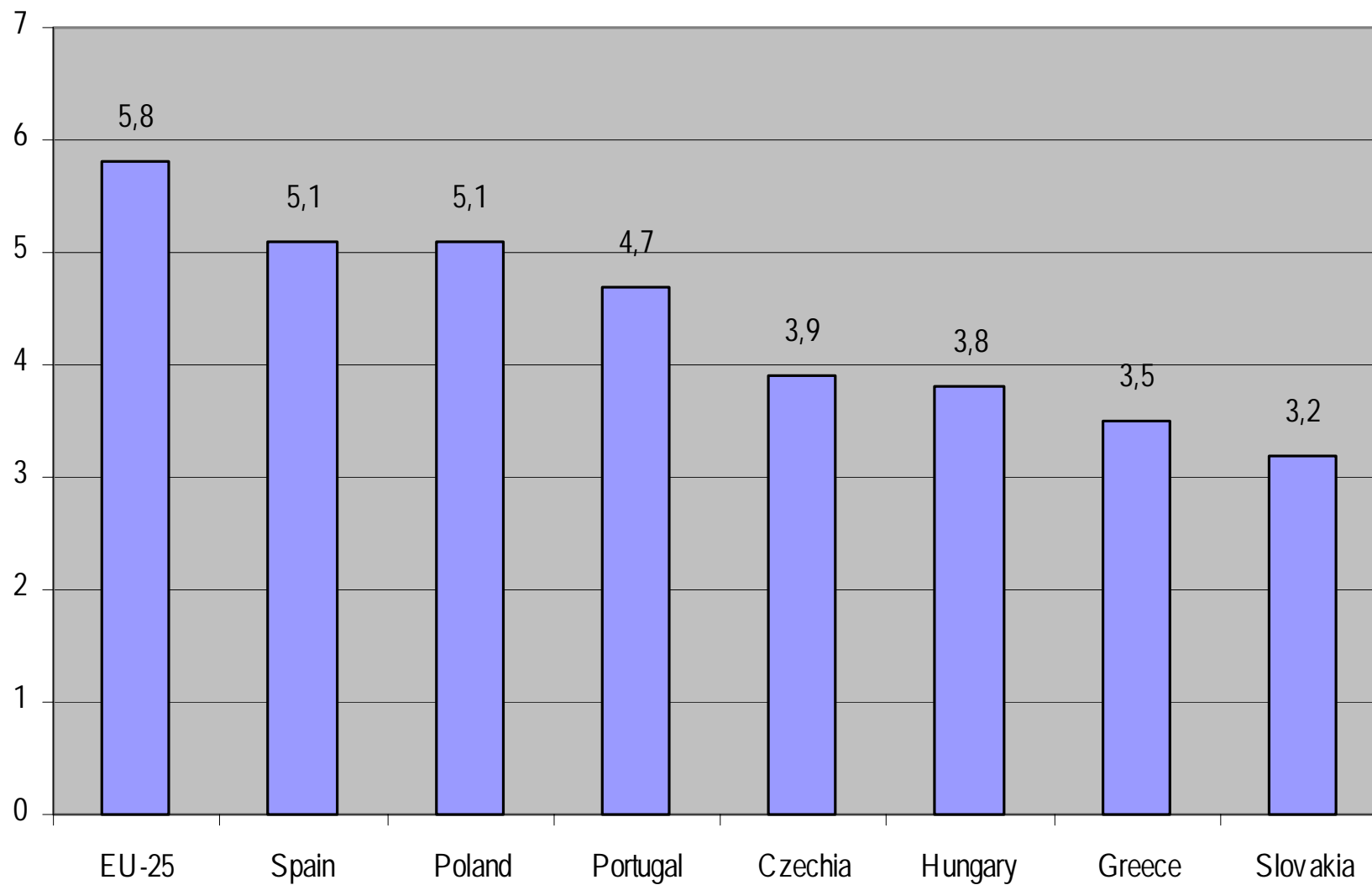
RESEARCH INTENSITY



1997-2001

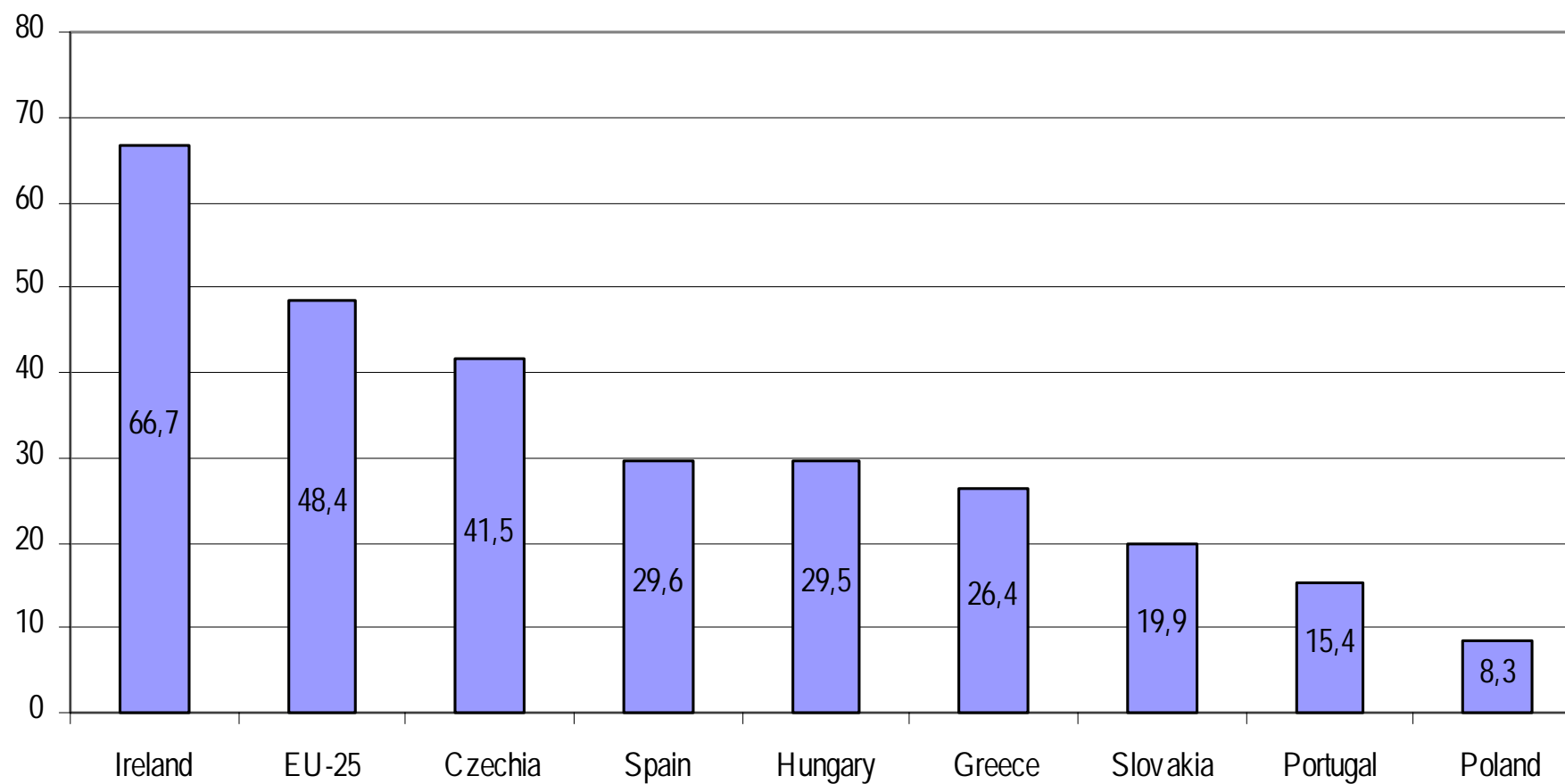


Number of researchers per 1000 employment





Number of researchers in per cent of business employment





WIDENING OF THE EUROPEAN KNOWLEDGE BASE (EUROPEAN RESEARCH AREA)

- HARMONIZATION OF NATIONAL RESEARCH PROGRAMMES
- RECOGNITION OF EXCELLENCE IN (BASIC) RESEARCH
(at present no financing on European level; ERC)
- RECRUITMENT, TRAINING AND CAREER PATH OF SCIENTISTS
(700 000 scientist-engineer positions until 2010)
- INFRASTRUCTURE
(attractive research conditions)
- BETTER USE AND DEVELOPMENT OF THE RESEARCH POTENTIAL OF
LESS DEVELOPED REGIONS
- MOBILITY



WHAT HAS HAPPENED AFTER LISBON?

THE CONCEPT OF THE EUROPEAN RESEARCH AREA

BARCELONA (3%)

GÖTEBORG (SUSTAINABLE DEVELOPMENT)

A NEW INSTRUMENT: TECHNOLOGY PLATFORMS

ERC ! [community efforts should not concentrate solely
on competitiveness, but on the foundations of it,
namely (basic) research]

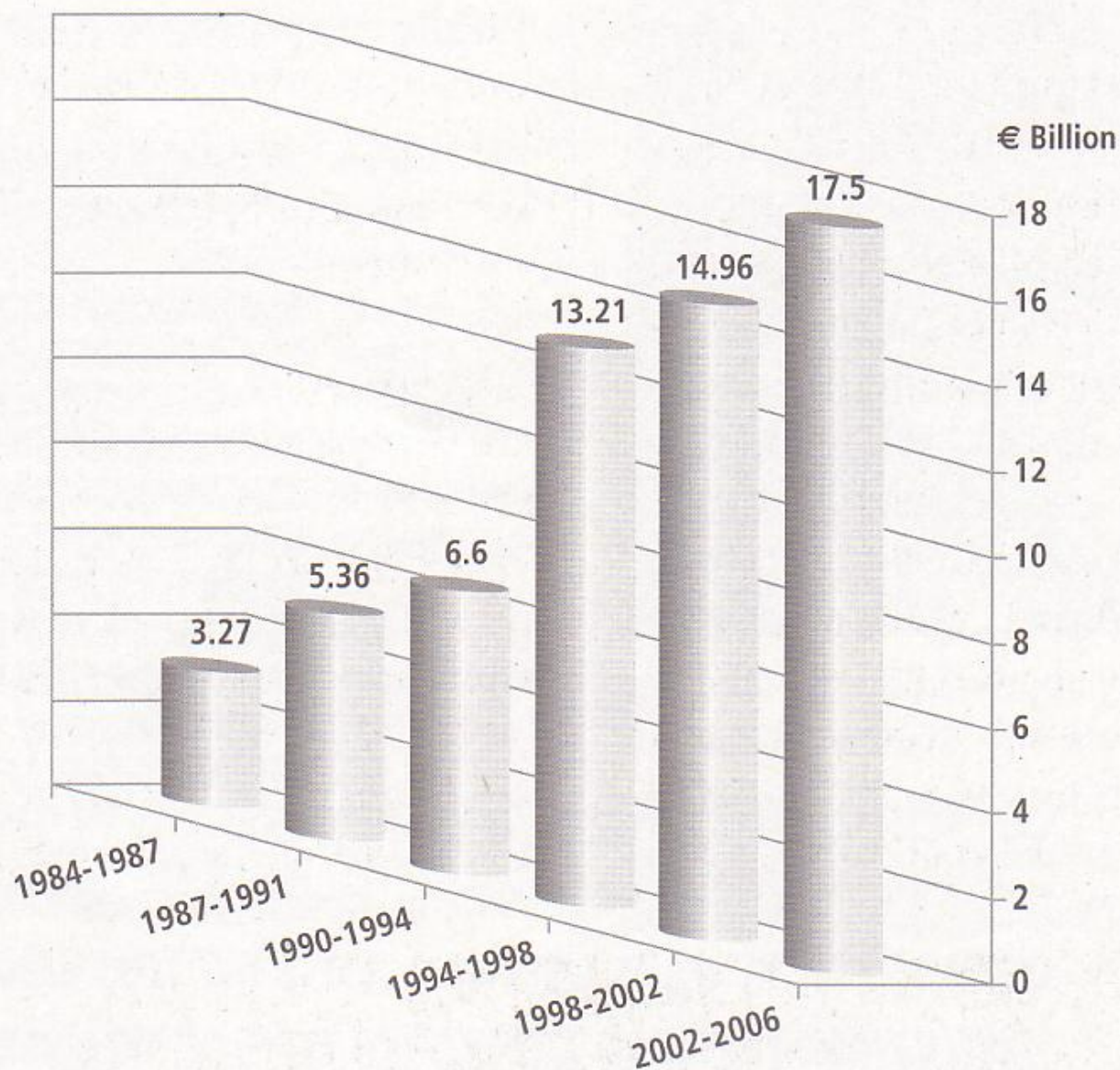
EIT? (changing concept, fine-tuning process)

positive development

BUDGET (>70Mrd → >54Mrd EURO)



Budgets for EU Framework Programmes



Budget

>54Bn in
7 years

↑
FP7



BASIC PHILOSOPHY OF FP7

THE BASIS OF THE LISBON PRINCIPLES: KNOWLEDGE

DEVELOPMENT OF THE KNOWLEDGE TRIANGLE:

- RESEARCH AND TECHNOLOGY**
- EDUCATION AND TRAINING (IN RESEARCH TOO)**
- INNOVATION**

INCREASED EMPHASIS ON RESEARCH (FP7!)

ERA;3%; LESS BUREAUCRACY

BETTER USE OF EXISTING CAPACITIES

MORE EFFICIENT UTILIZATION OF SCIENTIFIC

RESULTS (IN PRODUCTS, PROCESSES, SERVICES)



ON THE CONTENT (1)

FOUR SPECIFIC PROGRAMMES:

- COOPERATION (COLLABORATIVE PROJECTS;
NETWORKS; COORDINATION; THIRD COUNTRIES)**
- IDEAS (; ALL SCIENTIFIC AND TECHNOLOGICAL
FIELDS; INDIVIDUAL PERSONS OR GROUPS;**

ERC AS RUNNING ORGANIZATION!

- PEOPLE: MARIE CURIE PROGRAMME
(CAREER DEVELOPMENT; CONNECTION WITH THE
NATIONAL SYSTEMS)**



ON THE CONTENT (2)

- CAPACITIES (RESEARCH INFRASTRUCTURE;
RESEARCH FOR SME-S; REGIONAL RESEARCH;
SCIENCE AND SOCIETY)

PRIORITY COOPERATION THEMES (9):

HEALTH; FOOD; AGRICULTURE; BIOTECHNOLOGY; **ICT**;
NANOSCIENCE AND TECHNOLOGY; NEW MATERIALS
AND TECHNOLOGIES; ENERGY; ENVIRONMENT AND
CLIMATIC CHANGES); TRANSPORT AND AERONAUTICS;
SOCIAL SCIENCES AND HUMANITIES; SECURITY AND
SPACE RESEARCH.



ERC (1)

ONE OF THE KEY INSTRUMENTS TO REALIZE THE ERA
CONCEPT (ONE OF THE FOUR SPECIFIC PROGRAMMES
OF FP7)

EXPECTED BENEFITS

- NEW KNOWLEDGE, IDEAS, DISCOVERIES
- HIGHER QUALITY BY EUROPEAN LEVEL COMPETITION
- STRONGER EUROPEAN RESEARCH EFFORTS
- DECREASING FRAGMENTATION
- MINIMAL DUPLICATION OF EFFORTS AND RESOURCES
- THE EUROPEAN COMMISSION MAY HAVE A BETTER
VIEW OF RESEARCH IN EUROPE



ERC (2)

HOW?

TO PROMOTE EXCELLENCE IN ALL AREAS OF SCIENCE
COMPETITIVE FUNDING. SOLELY ON THE BASIS OF
EXCELLENCE

TO SUPPORT GROUP RESEARCH BUT INDIVIDUALS TOO
(FIRST OF ALL YOUNG RESEARCHERS, HIGH RISK,
INTERDISCIPLINARY)

MINIMAL BUREAUCRACY

EARLY STAGE INDEPENDENT INVESTIGATOR SCHEME

ESTABLISHED INVESTIGATOR GRANT SCHEME

**SPECIAL EUROPEAN PROGRAMMES FOR TRAINING AND
MOBILITY (TO INCREASE THE QUALITY AND NUMBER OF
RESEARCHERS IN EUROPE)**



ERC (3)

OWNERSHIP AND FUNDING:

ERC CREATED BY THE UNION AND ITS HEADS OF STATES
ACCOUNTABLE TO THE EC THROUGH ITS GOVERNING BODY
AUTONOMOUS SCIENTIFIC DECISION MAKING BODY
FUNDING MAINLY FROM THE EU BUDGET (FP-S ARE THE
ONLY POSSIBLE EU SOURCES)

AGREEMENTS WITH OTHER ORGANIZATIONS SHOULD BE
POSSIBLE (E.G. TO OBTAIN FINANCES OR TO BUILD UP
OTHER FORMS OF CO-OPERATION)

~7.5 BILLION EURO IN FP7 (~LINEAR INCREASE 300M-
1.7BN)

(2007- 2013)



ERC (4)

ORGANIZATION AND GOVERNANCE

SCIENTIFIC COUNCIL(22 members) SECRETARY GENERAL;
EXECUTIVE AGENCY. DIRECTOR

APPROPRIATE REPRESENTATION OF „THE OUTSIDE
WORLD“ (POLITICAL SYSTEM, INDUSTRY AND SOCIETY AT
LARGE)

BUT AUTONOMY AND INDEPENDENCE (IN LINE WITH
SCIENTIFIC STANDARDS AND CONDUCT)

SELECTION PROCESS: 20 PANELS (NOT DISCIPLINARY)

SOCIAL SCIENCES AND HUMANITIES

INDIVIDUALS AND ORGANIZATIONS

INSTITUTIONS, BEHAVIOUR, VALUES AND BELIEFS

THE HUMAN MIND AND ITS COMPLEXITY

CULTURES AND STRUCTURAL DIVERSITY

THE STUDY OF THE PAST AND OF CULTURAL ARTEFACTS

LIFE SCIENCES

MOLECULAR, CELLULAR AND DEVELOPMENTAL BIOLOGY

GENETICS, GENOMICS, BIOINFORMATICS AND SYSTEM
BIOLOGY

NEUROSCIENCES

EVOLUTIONARY, POPULATION AND ENVIRONMENTAL
BIOLOGY

APPLIED MEDICAL AND HEALTH SCIENCES

APPLIED BIOLOGY, BIOTECHNOLOGY AND BIOENGINEERING



NATURAL SCIENCES

MATHEMATICAL FOUNDATIONS

FUNDAMENTAL CONSTITUENTS OF MATTER

STRUCTURES AND REACTIONS

MATERIAL SCIENCES AND METHODS

INFORMATION AND COMMUNICATIONS

ENGINEERING SCIENCES

UNIVERSE SCIENCE

EART SYSTEM SCIENCE



ERC(5)

MISSION OF THE SCIENTIFIC COUNCIL:

DECIDE ON SCIENTIFIC STRATEGY

MONITOR AND CONTROL QUALITY AND PERFORMANCE

ESTABLISH A COMMUNICATION STRATEGY (INCL. TO THE
SCIENTIFIC COMMUNITY)

DEDICATED IMPLEMENTATION STRUCTURE (EXECUTIVE AGENCY):

OPERATES AND MANAGES THE ERC

IMPLEMENTS THE FUNDING PROCEDURE



EXPECTED BENEFITS FROM THE ERC FOR EUROPE

ENCOURAGING AND SUPPORTING THE BEST TALENTS

SUPPORT THE BEST IDEAS IN FRONTIER RESEARCH

STATUS AND VISIBILITY OF RESEARCH LEADERS

DYNAMIC STRUCTURAL EFFECTS ON THE EUROPEAN

RESEARCH SYSTEM

MAY NORTURE EUROPEAN SCIENCE BASED INDUSTRY

INVEST QUICKLY INTO THE KNOWLEDGE BASE

PARALLEL NEED TO INVEST INTO THE

RESEARCH INFRASTRUCTURE AND THE

COOPERATIVE ARRANGEMENTS (ERA-NET)



**THANK YOU FOR YOUR
ATTENTION**



**HUNGARIAN ACADEMY OF
SCIENCES**