

MANAGING KNOWLEDGE FOR GROWTH

**Public research programmes
for business and academia**

COURSE 1

1. Today's EU challenges & main strategies

1.1 THE XXIst CENTURY CHALLENGES

1.2 ANALYSIS: LONG TERM EUROPEAN TRENDS

1.3 RESPONSE: THE EUROPE 2020 GROWTH STRATEGY

2. Growth and Innovation in the EU

2.1 ANALYSIS : THE INNOVATION UNION SCOREBOARD

2.2 RESPONSE : THE INNOVATION UNION (2010-2020)

1. Today's EU challenges & main strategy

1.1 THE XXIst CENTURY CHALLENGES

THE XXIst CENTURY CHALLENGES - 1

ECONOMIC DRIVERS

◆ Globalisation of the economy

Teresa Goncalves in Portugal

- Industrial technologies allow production with less skills and staff
- IT & transport changed space/time relationship
- Liberalisation of commerce, trade, services.... People

Less than 2% mobile in EU

◆ Increasing technological content of products and services

Apollo XIII ('68) -> VW Passat (94) -> Washing machine ('04)

- Required to differentiate from global competition
- A must to face the pace of technological change
- An option to embed knowledge in mobile goods & services

*Competition between product & service eco-systems :
iPhone <> Android <> Nokia*

◆ Widening of the knowledge base required for core business

☞ **Need to simultaneously :**

- **Internationalise strategy**
- **Modernise production systems and products**
- **Widen networks of knowledge suppliers**

*Biotechnology & Cooking for Bread
Laser Welding for Bicycles*

*Marble for planes, bought by
Internet on ships*

THE XXIst CENTURY CHALLENGES - 2

SOCIAL DRIVERS

◆ Demography : European society is aging rapidly

- Fear of change, less dynamism
- New needs (and potential) e.g. in health and social services

*Democracy is dictatorship of majority :
50% of It voters will be pensioned in 2012*

◆ Quest for quality/sustainable development/individual needs

- Social constraints are also opportunities in the European society (Quality/Quantity, Security/Risk, Solidarity/ Freedom)

Who needs a 3rd fridge ?

Food and pharma innovation

◆ Difficulties of democratic governments

- Democracy is slow and complex, consensus making takes time
- Social dialogue is less representative of society (Less stable govts., Less representative unions and business associations)
- National values are less clear, need to do things together but why ?

Is solidarity in the EU dead ?

☞ **A new role for Government? Facilitate change and address Major Societal Challenges (Climate Change, Demographic Change, Safe Energy and food supply, Citizen security...)**

THE XXIst CENTURY CHALLENGES - 3

GLOBAL ORDER DRIVERS

Media & technology

◆ Globalisation of risk

- Probability for war has lowered, but threat has increased
- Power of destruction has increased, one can threaten many

Sarin in Tokyo, '9-11, Water poisoning?

◆ Local instability can influence the world

Tschernobyl, GMOs, Finance

- Need to care for local economy
- Need to care for local democracy
- Need to care for local health

Somalia, AfPak, Irak, Yugoslavia, Ukraine?

AIDS in Congo, SARS in China, MARS in Israel

◆ Multilateralism is gaining pace

- The Olympic Committee: 6.4 Billion people from 203 Countries ('10)
- The United Nations: 6.3 Billion people from 192 Countries ('10)
- The World Trade Organisation: 5.8 Billion people (150 Countries) ('10)

◆ War is not a solution : it only makes matters worse

- Unilateralism does not work : Irak, Haiti, Somalia / (+) Slovenia & Slovakia
- Yugoslavia, Afghanistan, Sudan ?

👉 **Need for a new global order**

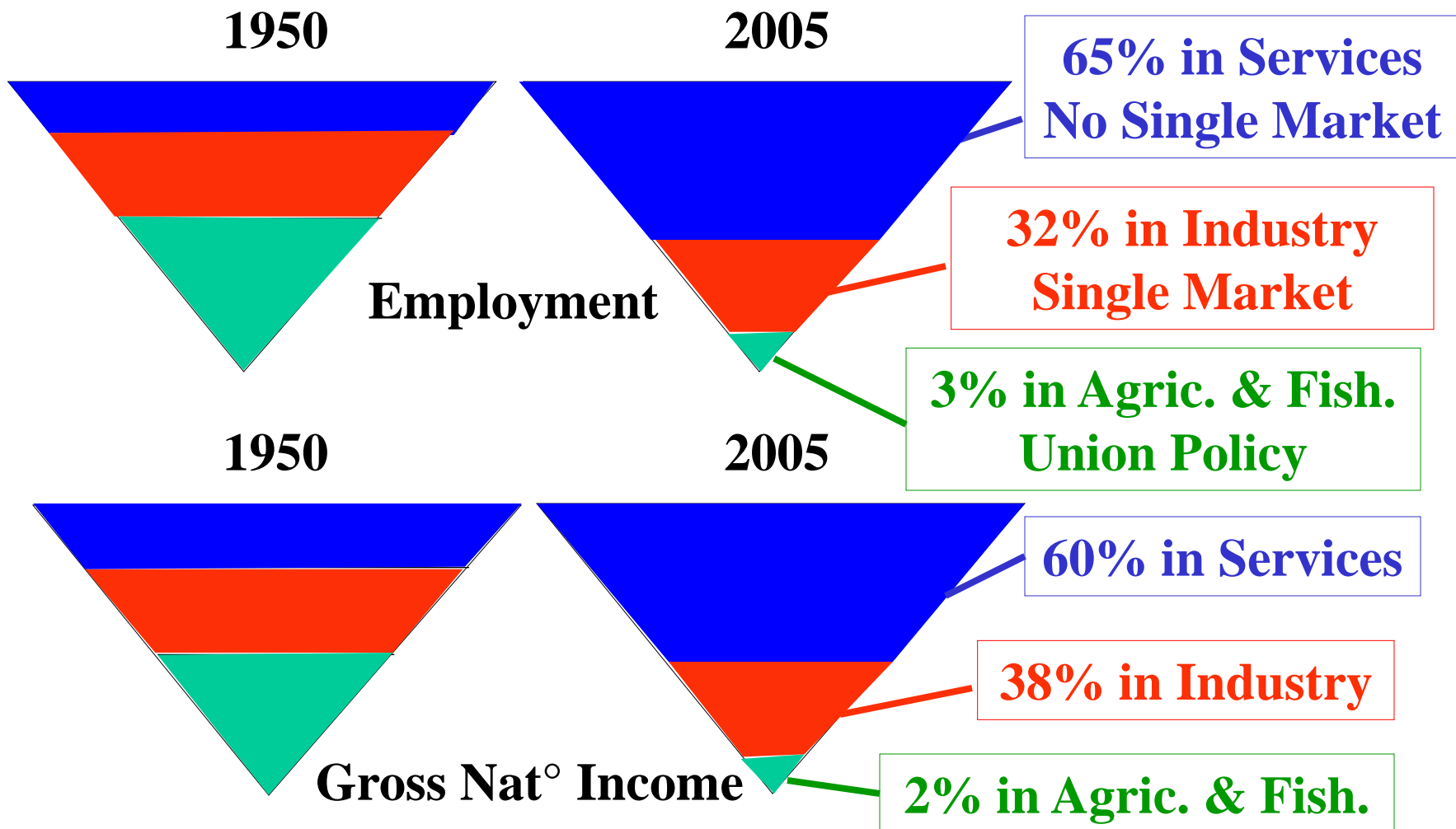
1. Today's EU challenges & main strategy

1.1 THE XXIst CENTURY CHALLENGES

1.2 ANALYSIS: LONG TERM EUROPEAN TRENDS

LONG TERM EUROPEAN TRENDS - 1

SERVICES PLAY A GROWING ROLE

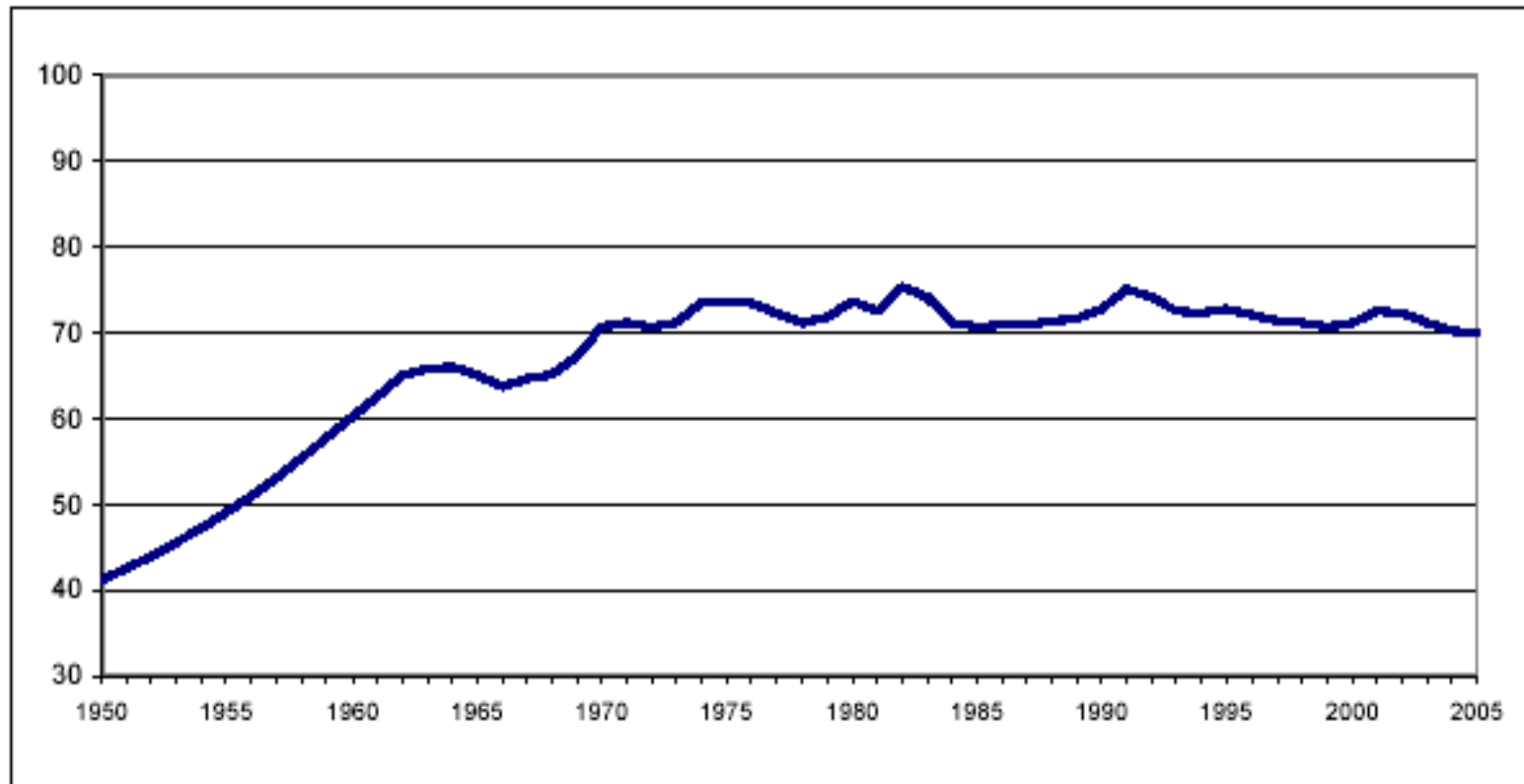


LONG TERM EUROPEAN TRENDS - 2

GNI /CITIZEN STOPPED CATCHING-UP

Abb. 1: EU-Pro-Kopf-BIP in KKS (zu konstanten Preisen von 1995)

(US = 100)

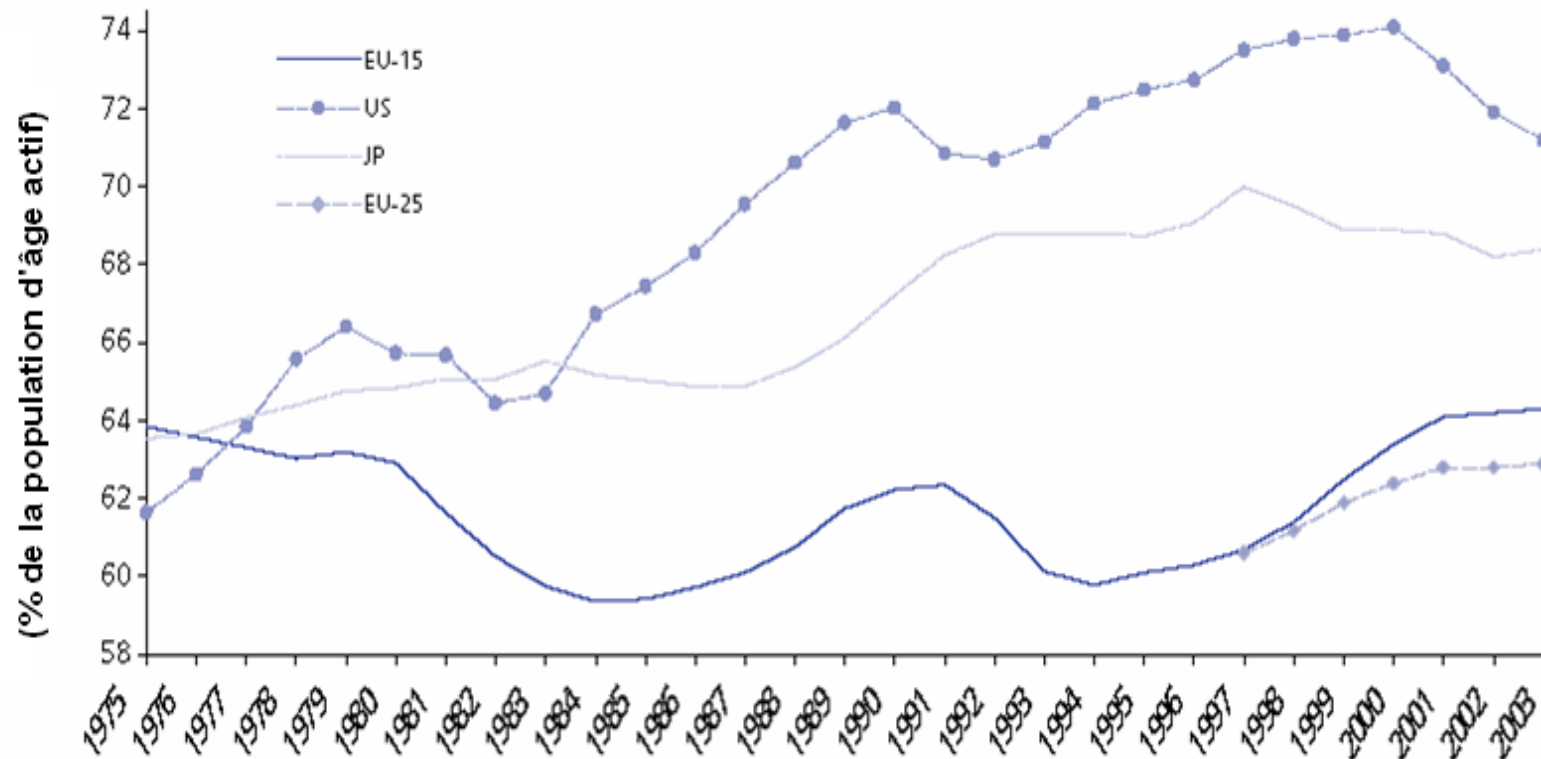


Quelle: Dienststellen der Kommission, Prognosen 2004-2005

LONG TERM EUROPEAN TRENDS - 3

EMPLOYMENT RATES STOP CATCHING-UP

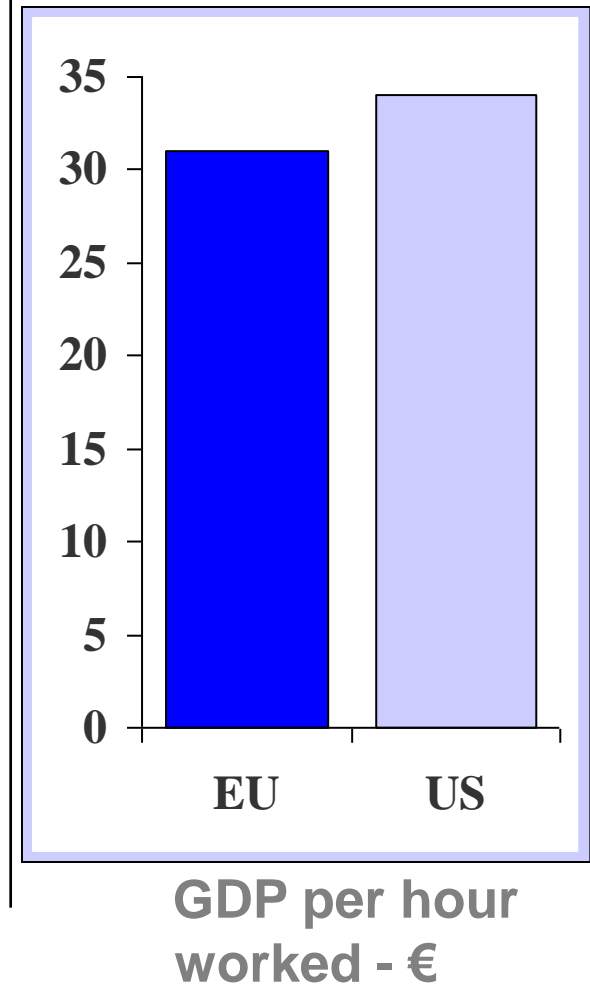
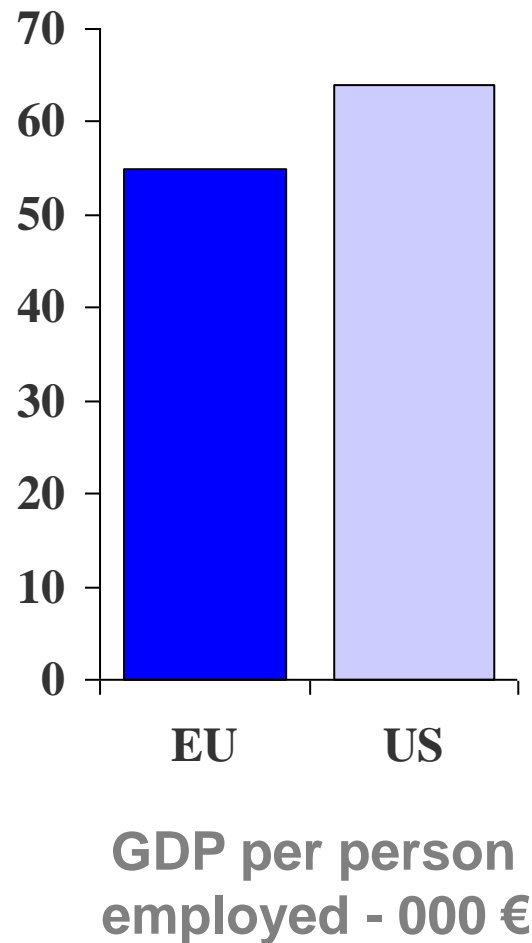
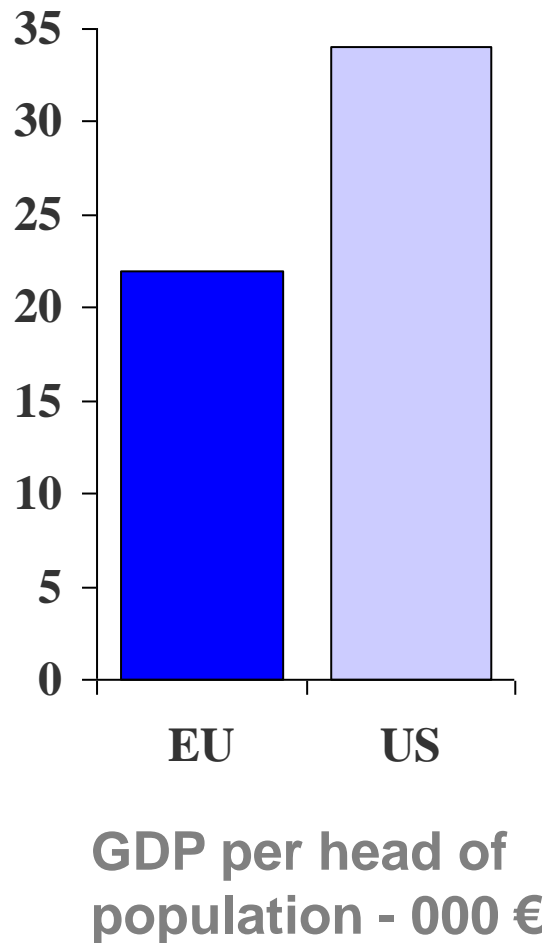
Taux d'emploi de l'UE, des EU et du Japon, 1975-2003



Source: DG EMPL calculation based on long-term trends in employment and population, Commission Services

LONG TERM EUROPEAN TRENDS - 4

REAL INCOME & PRODUCTIVITY, Work vs Leisure

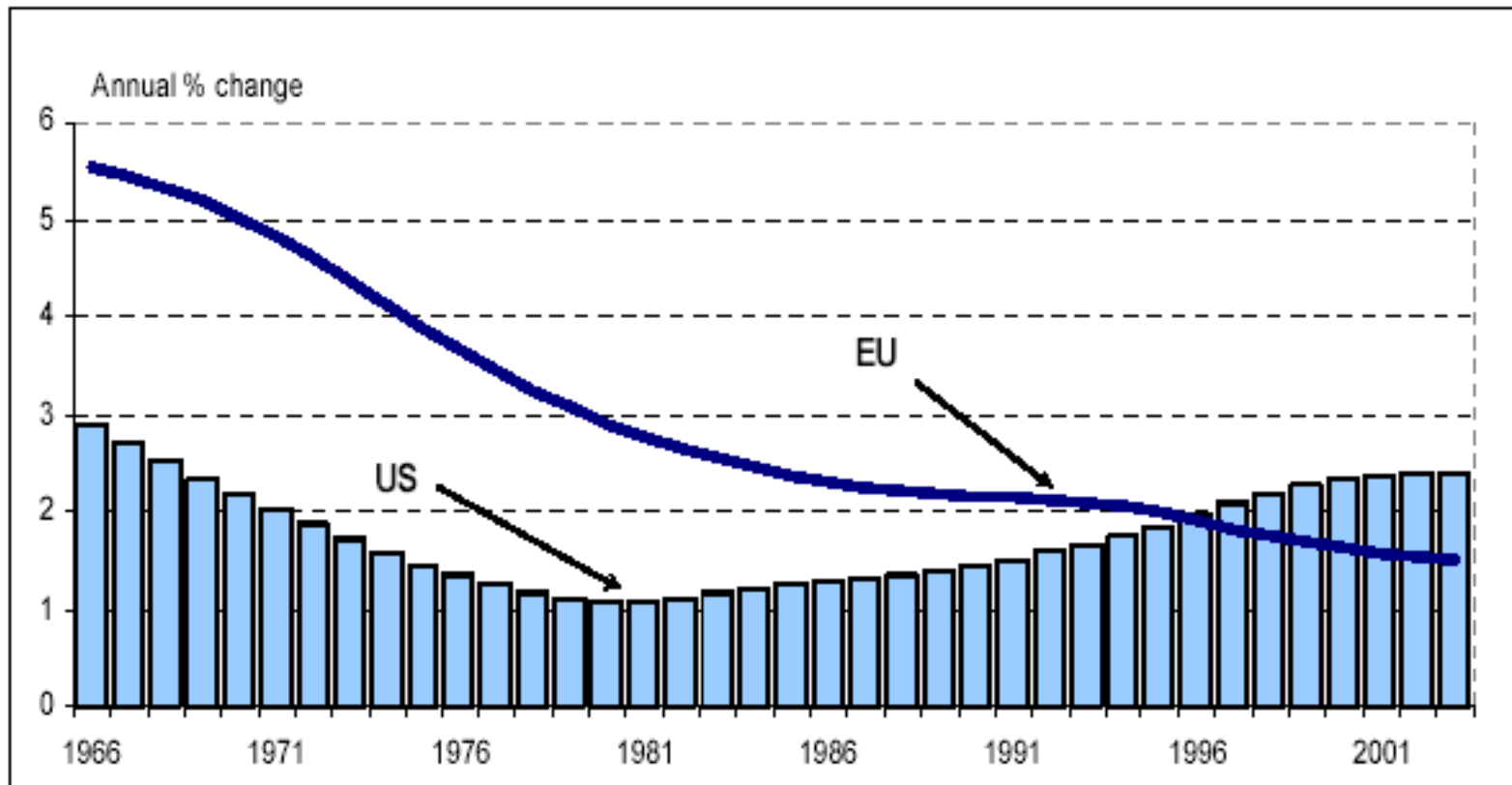


Source : Eurostat - 2004

LONG TERM EUROPEAN TRENDS - 5

PRODUCTIVITY GROWTH SLOWS DOWN

Abb. 2: Wachstum der Arbeitsproduktivität pro Stunde
(gleitender Durchschnitt)

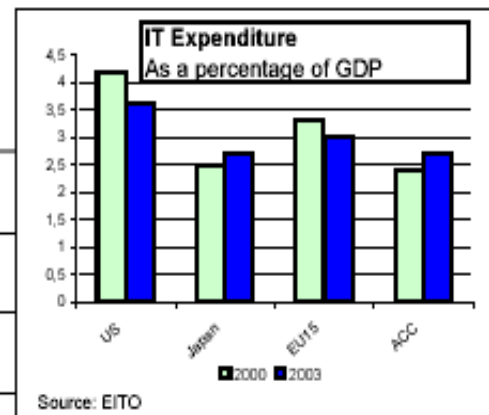
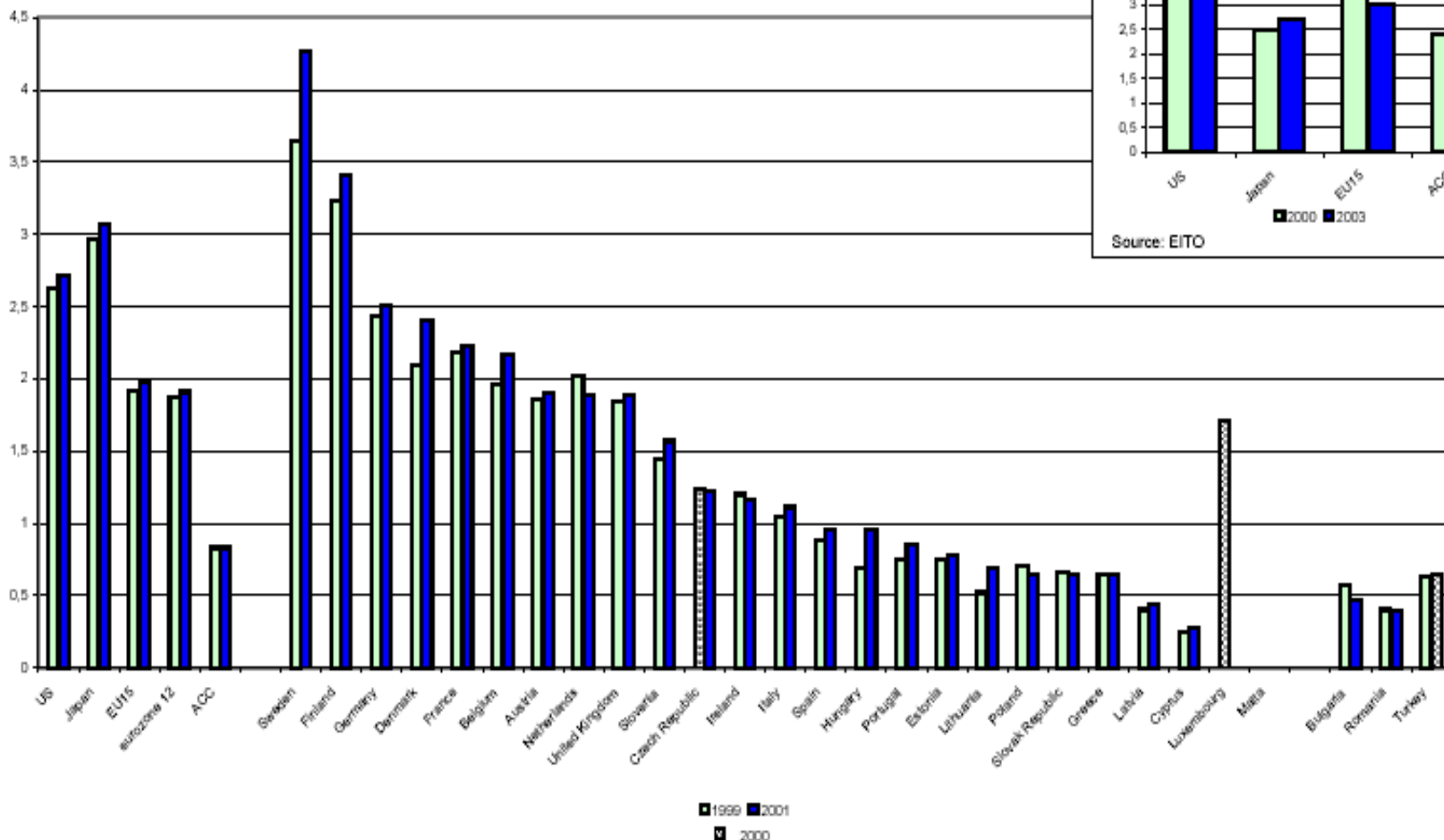


Quelle: EU-Kommission, AMECO-Datenbank

LONG TERM EUROPEAN TRENDS - 6

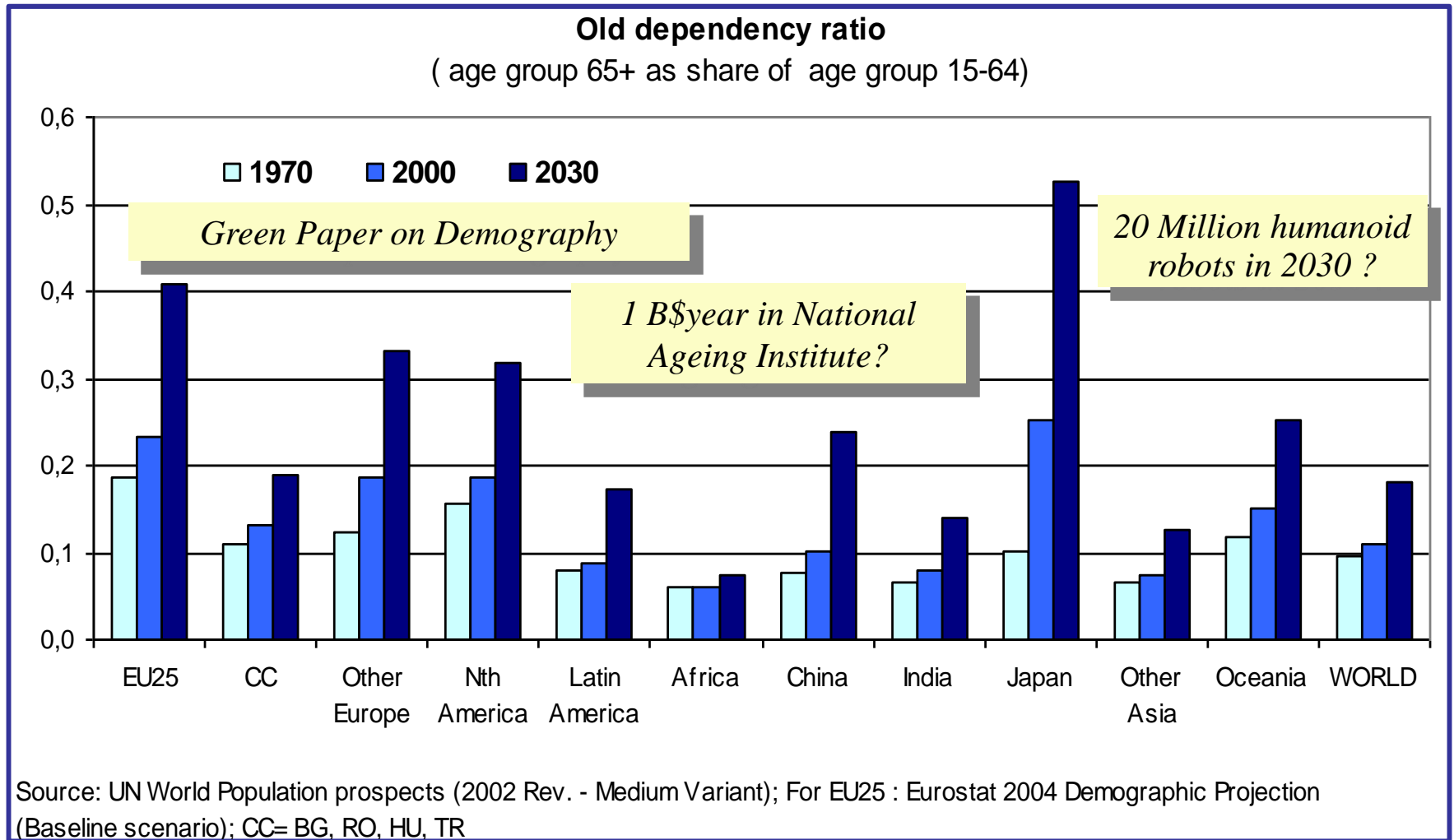
GROWING RESEARCH & INNOVATION GAP

INNOVATION AND RESEARCH
5 GERD (Gross domestic expenditure on R&D)
As a percentage of GDP



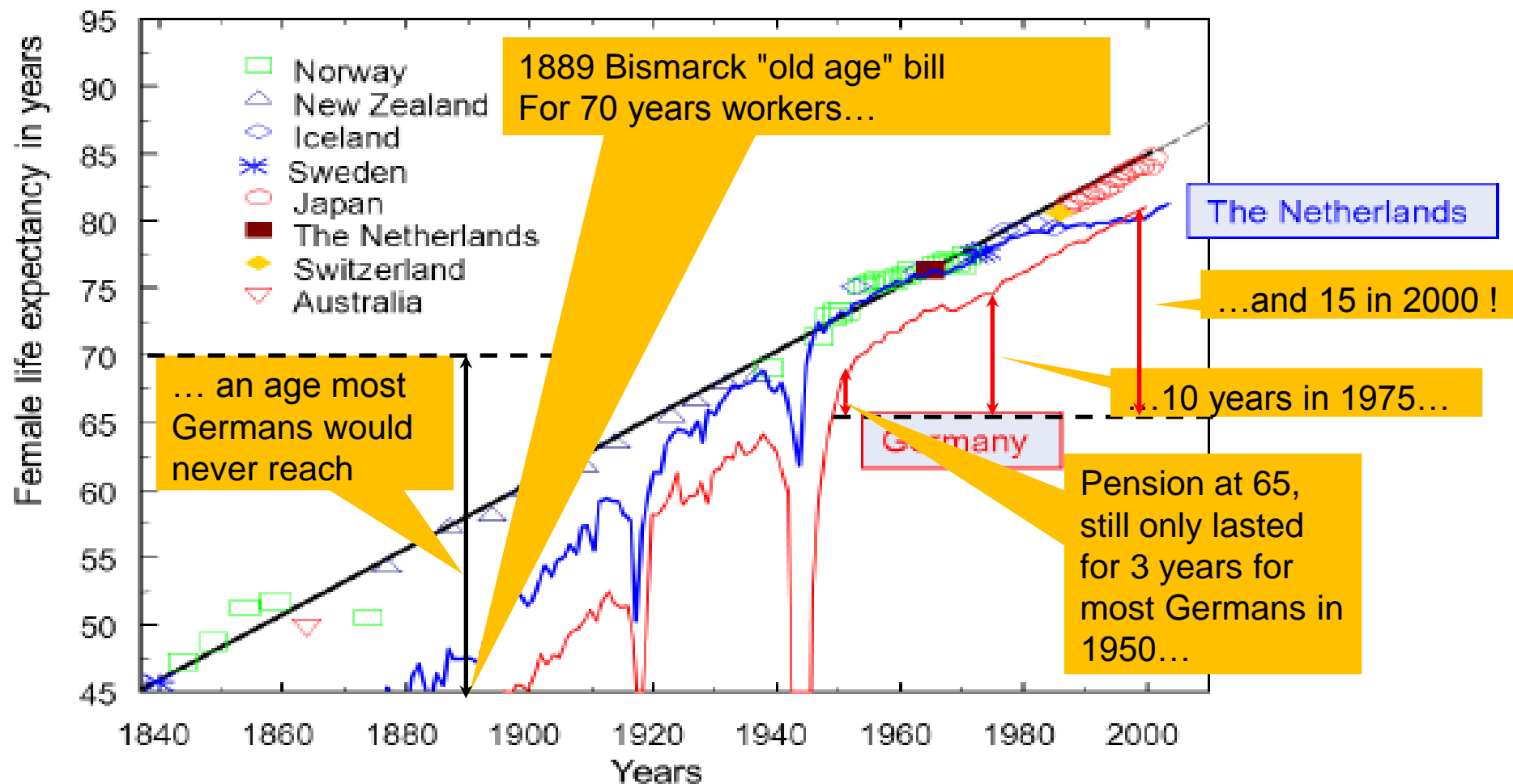
LONG TERM EUROPEAN TRENDS - 7

AN INCREASING OLD AGE DEPENDENCY



LONG TERM EUROPEAN TRENDS - 8

A NEW GENERATIONAL DEAL



Source: Max Planck Institute for Demographic Research Rostock

Uni TRENTO / Crash course on Research funding...

1. Today's EU challenges & main strategy

1.1 THE XXIst CENTURY CHALLENGES

1.2 ANALYSIS: LONG TERM EUROPEAN TRENDS

1.3 RESPONSE: THE EUROPE 2020 GROWTH STRATEGY

EU RESPONSES to A CHANGING WORLD

TWO SETS of 10 YEAR STRATEGIES



- ◆ 2000 – White paper on Governance
 - The EU can lead on soft issues
 - The EU can lead on medium term
 - EU for long term & complex issues
- ◆ 2001-2010 “Lisbon Strategy”
 - A competitive knowledge society
- ◆ 2006 – Revised Lisbon Strategy
 - Priority to growth and jobs
- ◆ **2010 – The EU 2020 Growth Strategy**
 - Smart and Innovative Growth
 - Clean and Sustainable Growth
 - Inclusive and Global Growth

EUROPEAN XXIst CENTURY STRATEGIES - 1

GLOBAL OBJECTIVES FOR ALL POLICIES

- ◆ *“Combining competitiveness that stimulates, solidarity that unites and co-operation that reinforces”* (White Paper on Growth, Competitiveness and Employment, Jacques Delors - 1993);
- ◆ *“EU to become the most competitive and dynamic knowledge based economy in the world, capable of sustainable growth with more and better jobs and greater social cohesion”* (Lisbon Strategy - March 2000);
- ◆ *“**Growth & innovation** for sustainable development. Based on balanced growth, price stability+highly competitive social market economy. **Promoting full employment** & social progress, a high level of social protection & environmental quality”* (Spring 2005)
- ◆ *“**Smart, sustainable and inclusive growth**”* (EU 2020 Strategy, March 2010)



EUROPE 2020

Presentation of J.M. Barroso,
President of the European Commission, to the Informal European Council of 11 February 2010

missie Komisja Europejska
a komisja Evropska
я КОМИСИЯ

REACTING TO THE FINANCIAL CRISIS

1. The crisis has wiped out long-term progress
2. Europe must react to avoid decline
3. Our room for manoeuvre is constrained
4. We must learn the lessons and turn to the future
5. Where do we want Europe in 2020?
6. From exit to lasting recovery
7. Three priorities for sustainable growth and jobs

Presentation of J.M. Barroso to the Informal European Council, 11 February 2010

Uni TRENTO / Crash course on Research funding...

The crisis has wiped out progress

1

- ◆ GDP growth: -4% in 2009, worst since the 1930s
- ◆ Industrial production: -20% with the crisis, back to the 1990s
- ◆ Unemployment levels:
 - 23 million people
 - 7 million more unemployed in 20 months
 - expected to reach 10.3% in 2010 (back to 1990s level)
 - youth unemployment over 21%

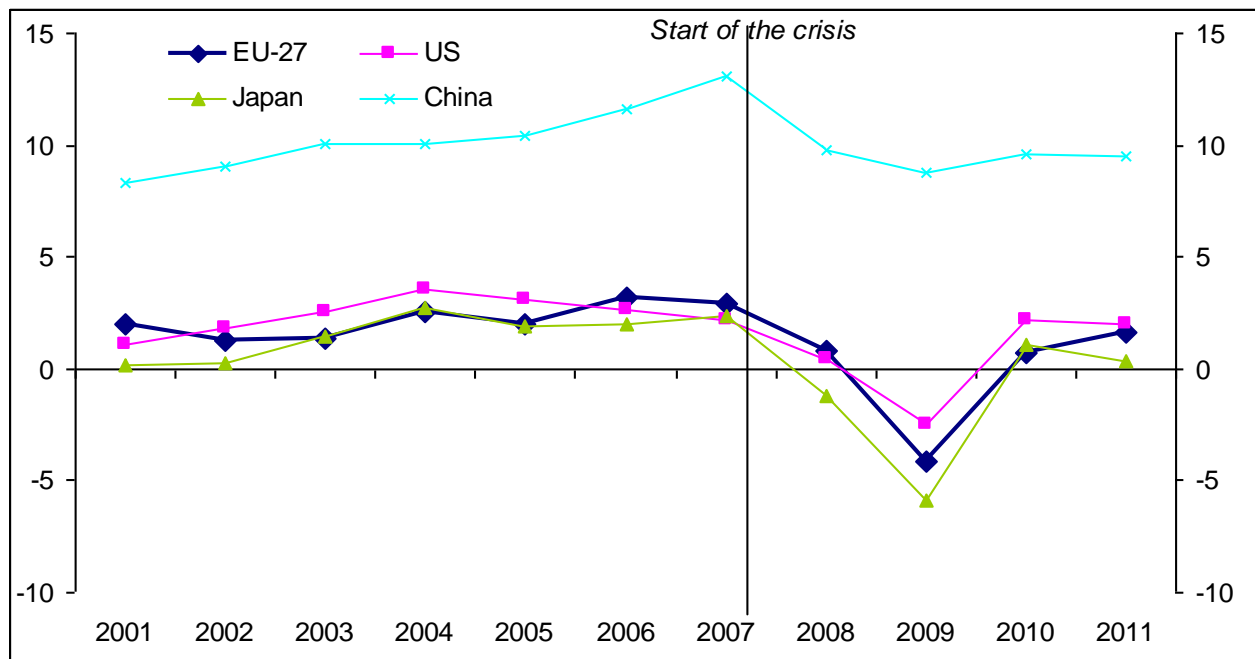
Presentation of J.M. Barroso to the Informal European Council, 11 February 2010

Uni TRENTO / Crash course on Research funding...

Europe's growth was severely hit

2

Annual GDP growth (%)



Source: European Commission

Presentation of J.M. Barroso to the Informal European Council, 11 February 2010

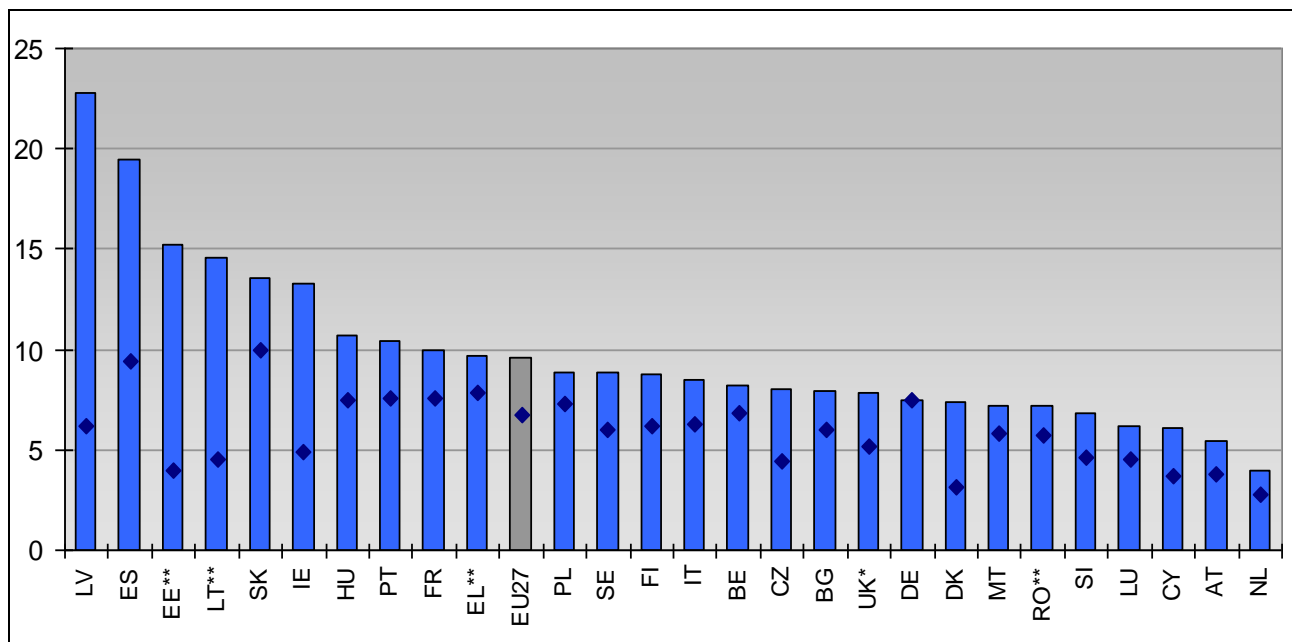
Uni TRENTO / Crash course on Research funding...

Unemployment has spread

3

Unemployment rates in the EU, December 2009 (and increase since March 2008)

■ December 2009 ◆ March 2008



Source: European Commission

Notes: * UK: October 2009; ** EE, EL, LT and RO: third quarter 2009

Presentation of J.M. Barroso to the Informal European Council, 11 February 2010

Uni TRENTO / Crash course on Research funding...

Europe must react to avoid decline

4

- ◆ Our growth potential has been halved by the crisis:
if we do nothing, we will end the decade with very low economic growth
- ◆ Ageing is accelerating: our working age population will be reduced by about 2 million by 2020, and the number of 60+ is increasing twice as fast as before 2007
- ◆ Productivity levels are lagging behind: two-thirds of our income gap with the US is due to lower productivity

Presentation of J.M. Barroso to the Informal European Council, 11 February 2010

Uni TRENTO / Crash course on Research funding...

Our room for manoeuvre is limited

5

EUROPE 2020

- ◆ Our public finances are very severely affected: deficits at 7% GDP on average and debt levels at over 80%; 2 years wiped out 20 years of consolidation
- ◆ Our financial system still needs fixing: reduced bank lending is still holding back recovery
- ◆ Global competition is fierce: EU share of global exports is declining relative to China and India

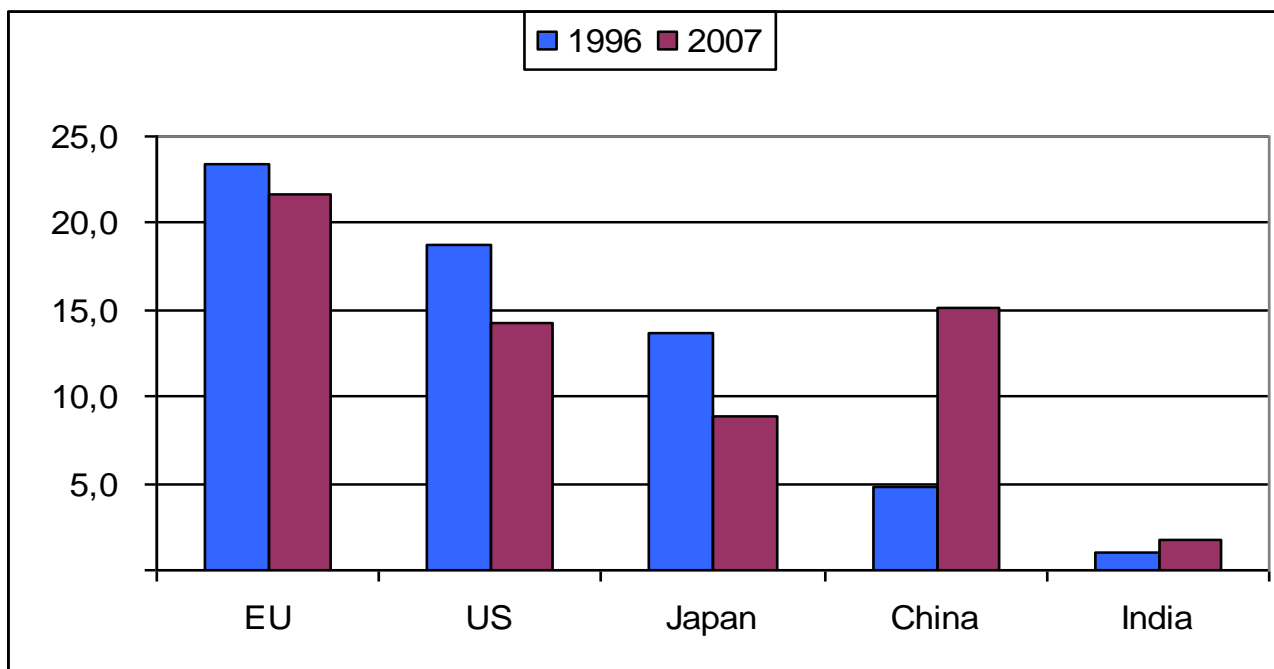
Presentation of J.M. Barroso to the Informal European Council, 11 February 2010

Uni TRENTO / Crash course on Research funding...

Global competition is fierce

6

Export share (% world exports)



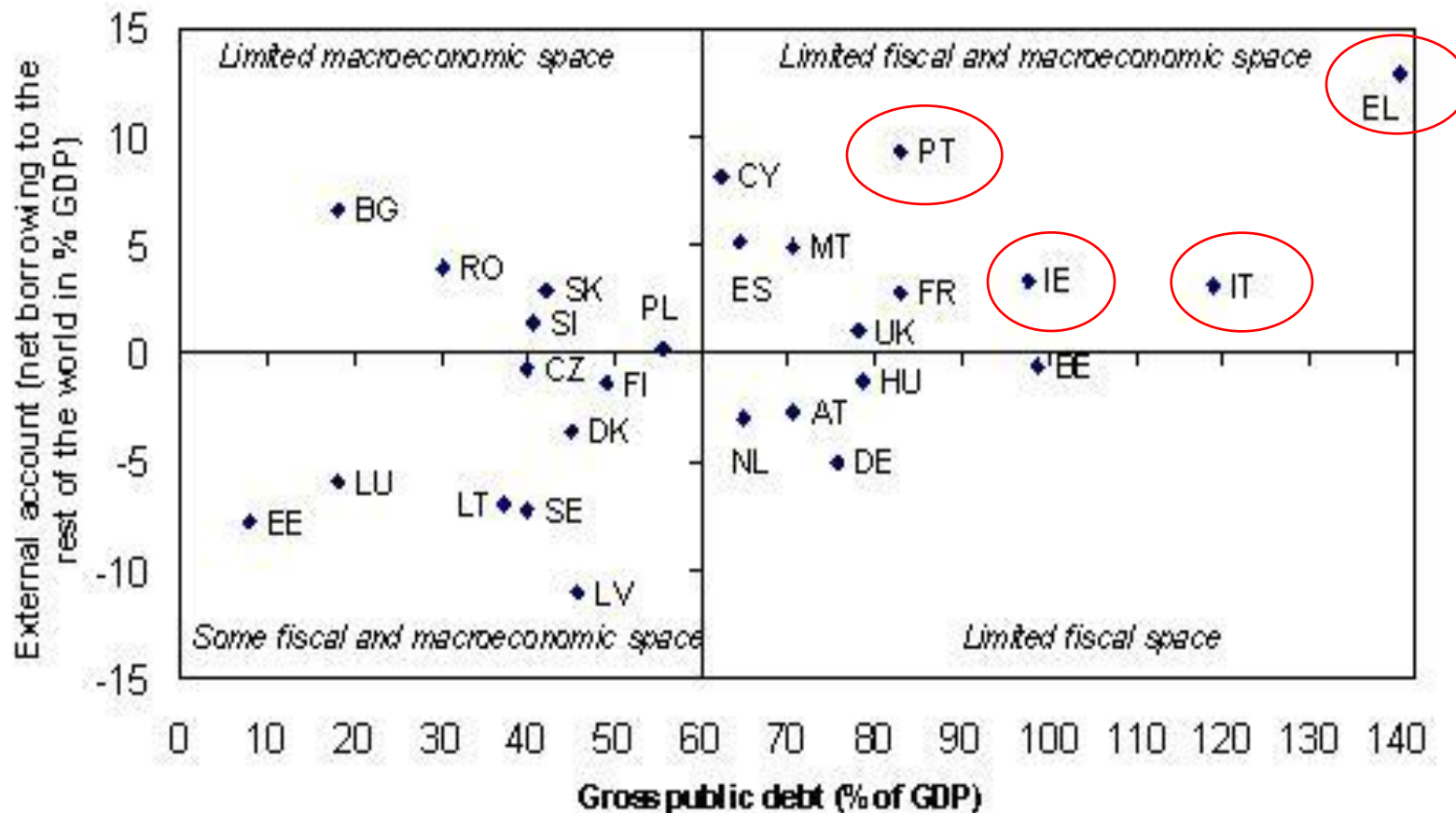
Source: European Commission

Presentation of J.M. Barroso to the Informal European Council, 11 February 2010

Uni TRENTO / Crash course on Research funding...

Different starting conditions in 2011

Public debt /external account deficit



Annual Growth Survey, European Commission, 12 January 2011

Uni TRENTO / Crash course on Research funding...

We must learn the lessons

7

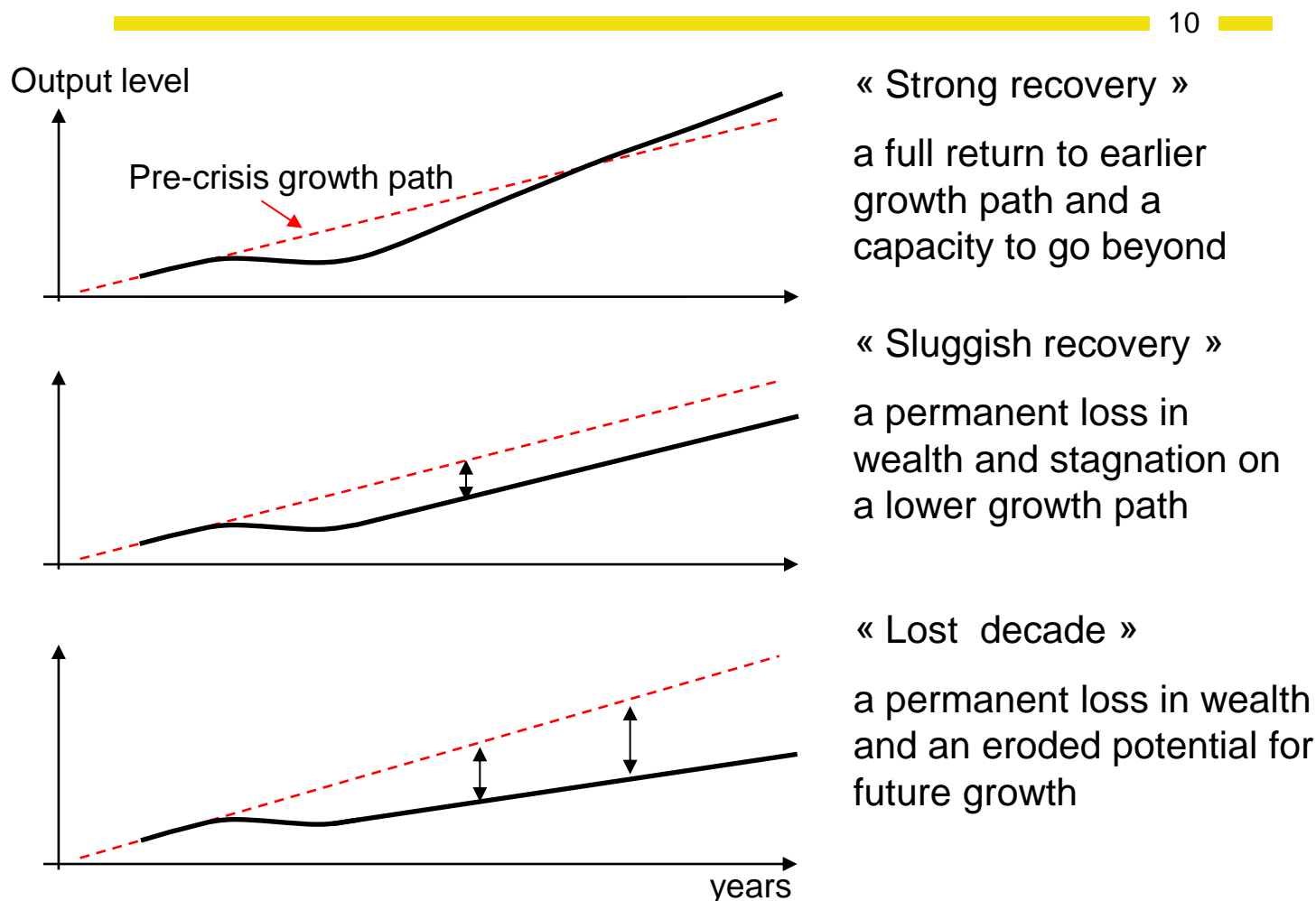
- ◆ Our economies are interdependent: up to 70% of car components for each car produced in the EU come from other Member States; overall, for € 1000 of growth in a Member State, around € 200 goes to other Member States via intra-EU trade
- ◆ In the crisis, the need for coordination became obvious; it is even more crucial for our recovery: decisions taken in one Member State impact the others
- ◆ The EU adds value: we should build on our strengths
 - the internal market, the euro - and on our leadership in the G20

Presentation of J.M. Barroso to the Informal European Council, 11 February 2010

Uni TRENTO / Crash course on Research funding...

Where do we want Europe in 2020?

EUROPE 2020



Presentation of J.M. Barroso to the Informal European Council, 11 February 2010

Uni TRENTO / Crash course on Research funding...

From exit to lasting recovery

11

- ◆ The “exit” means the entry into a different economy: we will not return to the situation before the crisis
- ◆ We must face up long-term realities – globalisation, pressure on resources, ageing, technological trends – and tap our full potential
- ◆ 2020 starts now: our recovery efforts must pave the way for sustainable growth and fiscal consolidation

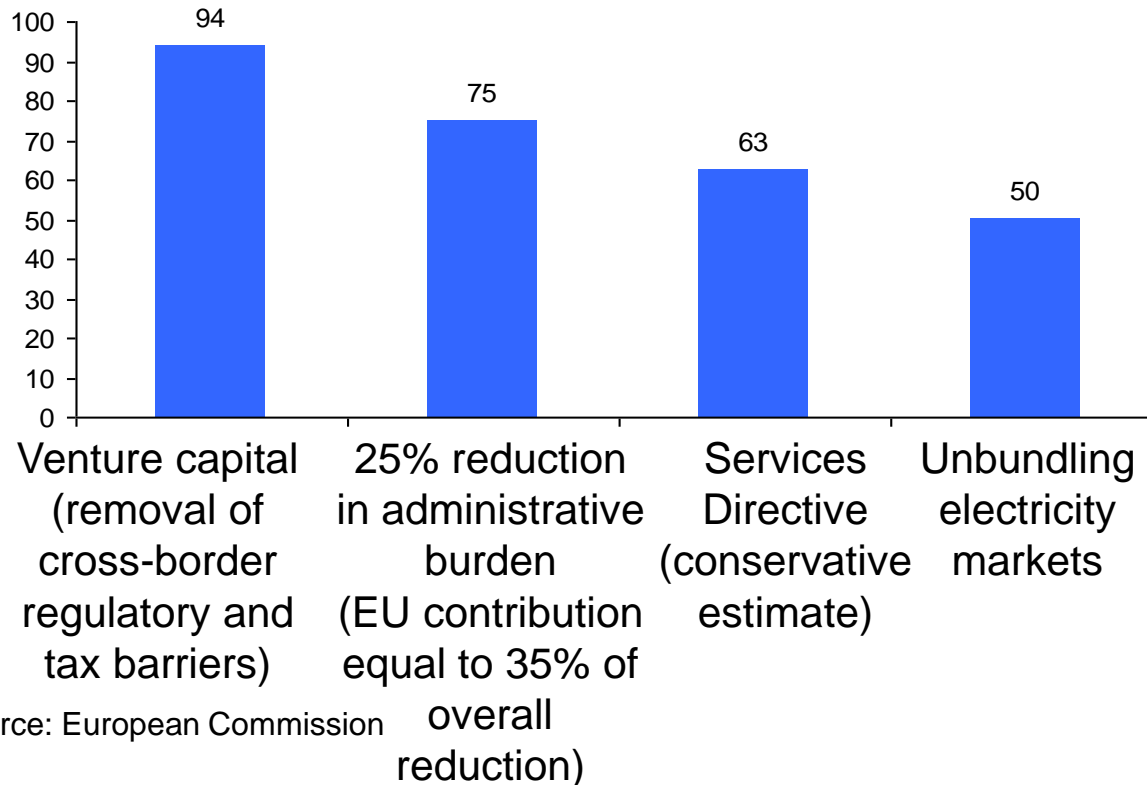
Presentation of J.M. Barroso to the Informal European Council, 11 February 2010

Uni TRENTO / Crash course on Research funding...

Acting together at EU level pays off

12

Medium-term impact (2020) on EU GDP of specific EU-level measures – model simulations.



Presentation of J.M. Barroso to the Informal European Council, 11 February 2010

Uni TRENTO / Crash course on Research funding...

Three priorities for sustainable growth and jobs

13

◆ Growth based on knowledge and innovation

- Innovation
- Education
- Digital society

◆ An inclusive high-employment society

- Employment
- Skills
- Fighting poverty

◆ Green growth: a competitive and sustainable economy

- Combating climate change
- Clean and efficient energy
- Competitiveness

Presentation of J.M. Barroso to the Informal European Council, 11 February 2010

Uni TRENTO / Crash course on Research funding...

Growth based on knowledge and innovation

14

INNOVATION	EDUCATION	DIGITAL SOCIETY
<p><u>Key facts</u></p> <ul style="list-style-type: none"> • R&D spending is below 2%, compared to 2.6% in the US and 3.4% in Japan; our smaller share of high-tech firms explains half of the gap with the US • Google spends more on information and communication technologies R&D than the EU FP7 does 	<p><u>Key facts</u></p> <ul style="list-style-type: none"> • Less than 1 person in 3 aged 25-34 has a university degree, compared to 40% in the US and over 50% in Japan • 1 in 7 young people drop out of school, and 1 in 4 have poor reading skills 	<p><u>Key facts</u></p> <ul style="list-style-type: none"> • The world market in information and communication technologies is worth € 660 billion and employs 1/3 of research workforce: EU firms make up only 23% of this • 56% of households have a broadband connection, but many users have doubts about safety and financial transactions on the internet
<p><i>Innovation Union</i></p> <p>R&D/GDP = 3% (from 2%)</p>	<p><i>Youth on the Move</i></p> <p>40% tertiary ed. (from 31%)</p>	<p><i>EU Digital Agenda</i></p> <p>2020 Headline indicators</p>

Presentation of J.M. Barroso to the Informal European Council, 11 February 2010

Uni TRENTO / Crash course on Research funding...

An inclusive high-employment society

15

JOBS	SKILLS	FIGHTING POVERTY
<p><u>Key facts</u></p> <ul style="list-style-type: none"> • Despite progress, only 2/3 of our working age population is employed (66%), compared to over 70% in the US and Japan • Only 46% of our older workers (55-64) are employed compared to over 62% in the US and Japan 	<p><u>Key facts</u></p> <ul style="list-style-type: none"> • About 80 million people have low or basic skills, but lifelong learning benefits mostly the more educated • By 2020, 16 million more jobs will require high qualifications, while the demand for low skills will drop by 12 million jobs 	<p><u>Key facts</u></p> <ul style="list-style-type: none"> • 80 million people were at risk of poverty in the EU prior to the crisis; 19 million are children; unemployed are particularly exposed • 8% of people in work don't earn enough to make it above the poverty threshold

An EU agenda for new skills and jobs

EU Anti-poverty platform

**Empl. Rate = 75%
(from 69%)**

**Early School leavers
10% (from 15%)**

**Lift 20 million
out of poverty**

Presentation of J.M. Barroso to the Informal European Council, 11 February 2010

Uni TRENTO / Crash course on Research funding...

Green growth: a sustainable and competitive economy

E-Bay, E-tickets, You Tube, Customer evolution, Pyramid power...

COMBATING CLIMATE CHANGE	ENERGY	COMPETITIVENESS
<p><u>Key facts</u></p> <ul style="list-style-type: none"> • Achieving our goals means reducing emissions by twice as quickly in the next decade than in the last decade • Jobs in the eco-industry have increased by 7% every year since 2000; meeting our renewable target would mean 2.8 million jobs in the sector 	<p><u>Key facts</u></p> <ul style="list-style-type: none"> • Meeting our goals will result in € 60 billion less in oil and gas imports by 2020 • Further progress with the internal market for energy can add 0.6% to 0.8% GDP 	<p><u>Key facts</u></p> <ul style="list-style-type: none"> • The market for green technologies is forecast to triple by 2030 / Improving resource efficiency by 20% would increase EU growth by around 1 per cent • Using the single market to the full / improved market access and regulatory convergence can boost growth and jobs

Quality not quantity

A Resource efficient Europe (20 / 20 / 20 plan)

Reduce green gas by 20% ('90)
Increase renewable energy by 20%
Reduce energy waste by 20%

An Industrial Policy for the Globalisation Era

1 February 2010
ch funding...

2. Growth and Innovation in the EU

2.1 CHALLENGES : THE EU INNOVATION SCOREBOARD

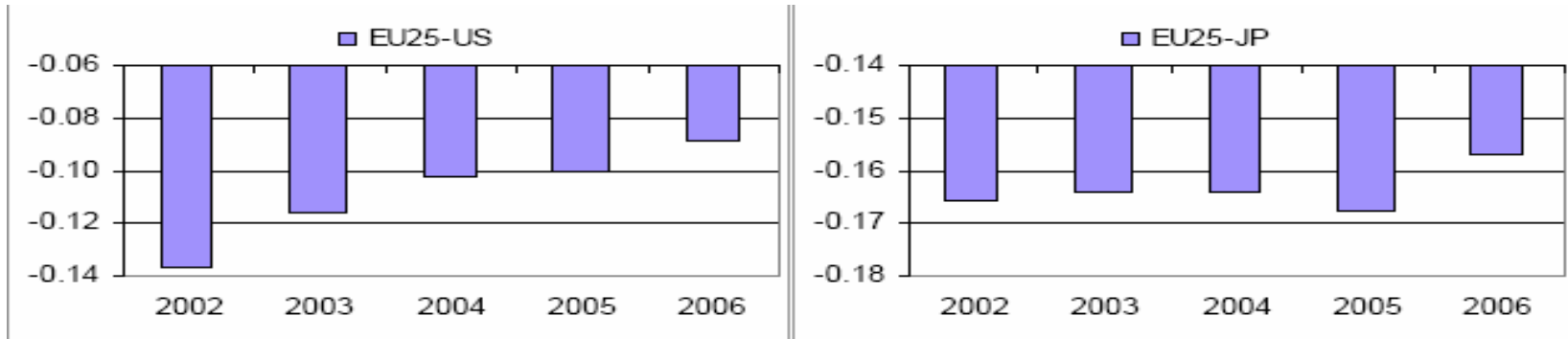
EU INNOVATION SCOREBOARD - 1

WHAT IS INNOVATION IN A KNOWLEDGE BASED ECONOMY?

- ◆ Old definition - Research gets to the market as a new (or improved) product or industrial (business) process
- ◆ “New” definition – Knowledge which reaches production, the market or the citizen
- ◆ Innovation input indicators :
 - *Innovation drivers* (5 indicators), measure the structural conditions required for innovation potential;
 - *Knowledge creation* (4 indicators), measure the investments in R&D activities, key elements for a successful knowledge-based economy;
 - *Innovation & entrepreneurship* (6 indicators), measure the efforts towards innovation at firm level.
- ◆ Innovation output indicators :
 - *Applications* (5 indicators), measure the performance as labour and business activities, and their value added in innovative sectors;
 - *Intellectual property* (5 indicators), measure the achieved results in terms of successful know-how.

EU INNOVATION SCOREBOARD - 5

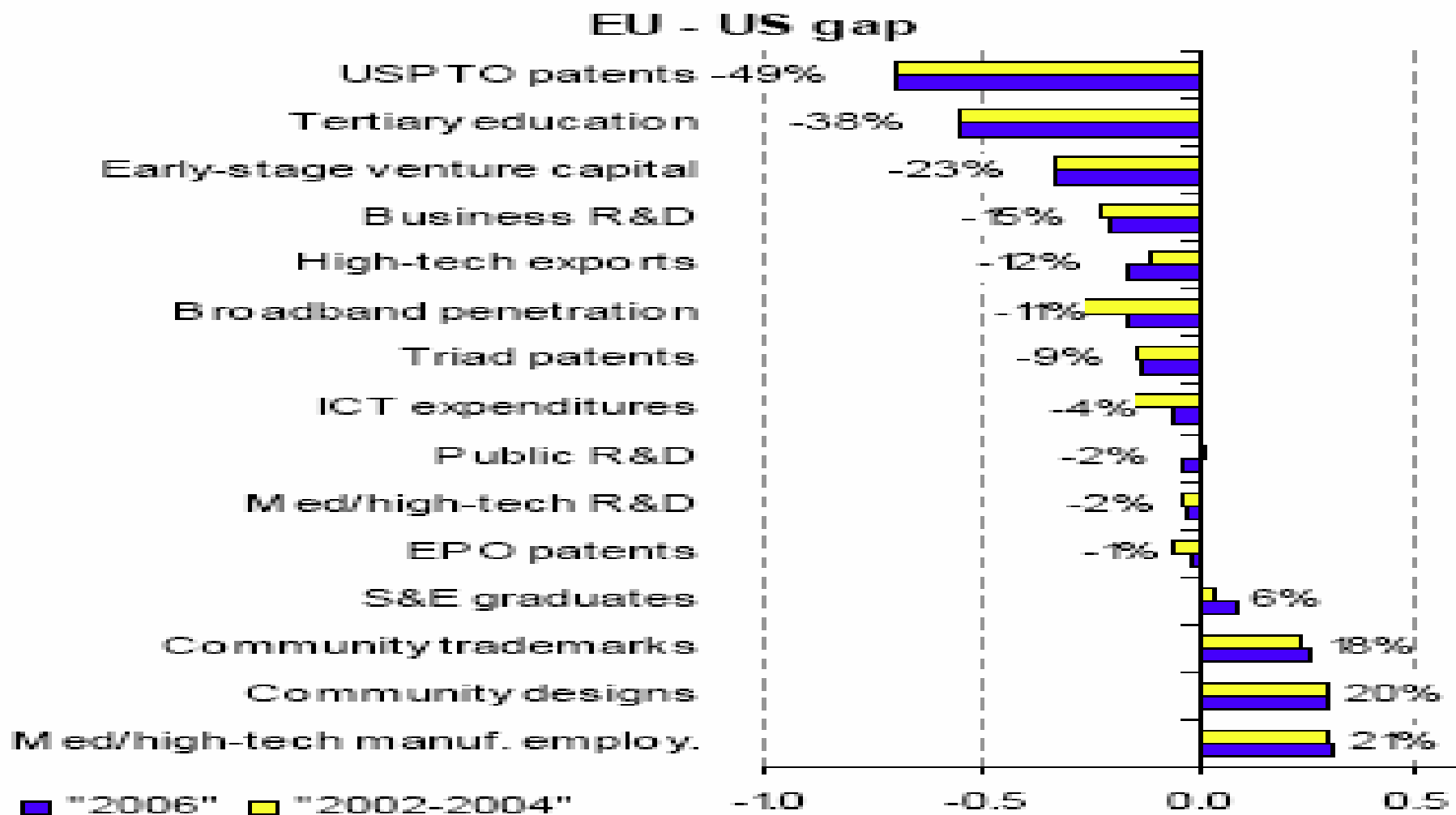
THE INNOVATION GAP IS CLOSING



- ◆ The Innovation gap is getting smaller
- ◆ Europe is lagging behind the US and Japan with regard to innovation drivers, knowledge creation and intellectual property.
- ◆ For the remaining two innovation categories (i.e. innovation & entrepreneurship and applications) the available evidence does not allow to draw any firm conclusion.

EU INNOVATION SCOREBOARD - 6

ANALYSING EU-US INNOVATION GAP



EU INNOVATION SCOREBOARD - 7

THE EU LEADS THE WORLD in 4 AREAS

- ◆ New graduates in science & engineering (EU:13‰ > US : 10‰)
 - ☞ Much better education at graduate and undergraduate level (similar to Japan).
- ◆ In Europe and Japan, employment in manufacturing industries that produce medium/high and high-tech goods (7% of total) is twice than that in the US (4% of total).
 - ☞ Competitive strength but declining trend for all triad countries
- ◆ European trading companies (101 EC trademarks/million) lead US (34 trademarks) and Japan (only 12 trademarks).
- ◆ The number of Community designs is also very high in Europe (111 new designs per million population in 2005) with respect to US and Japan (18 and 13 new designs).
 - ☞ Competitive strength in design and trade mark innovation

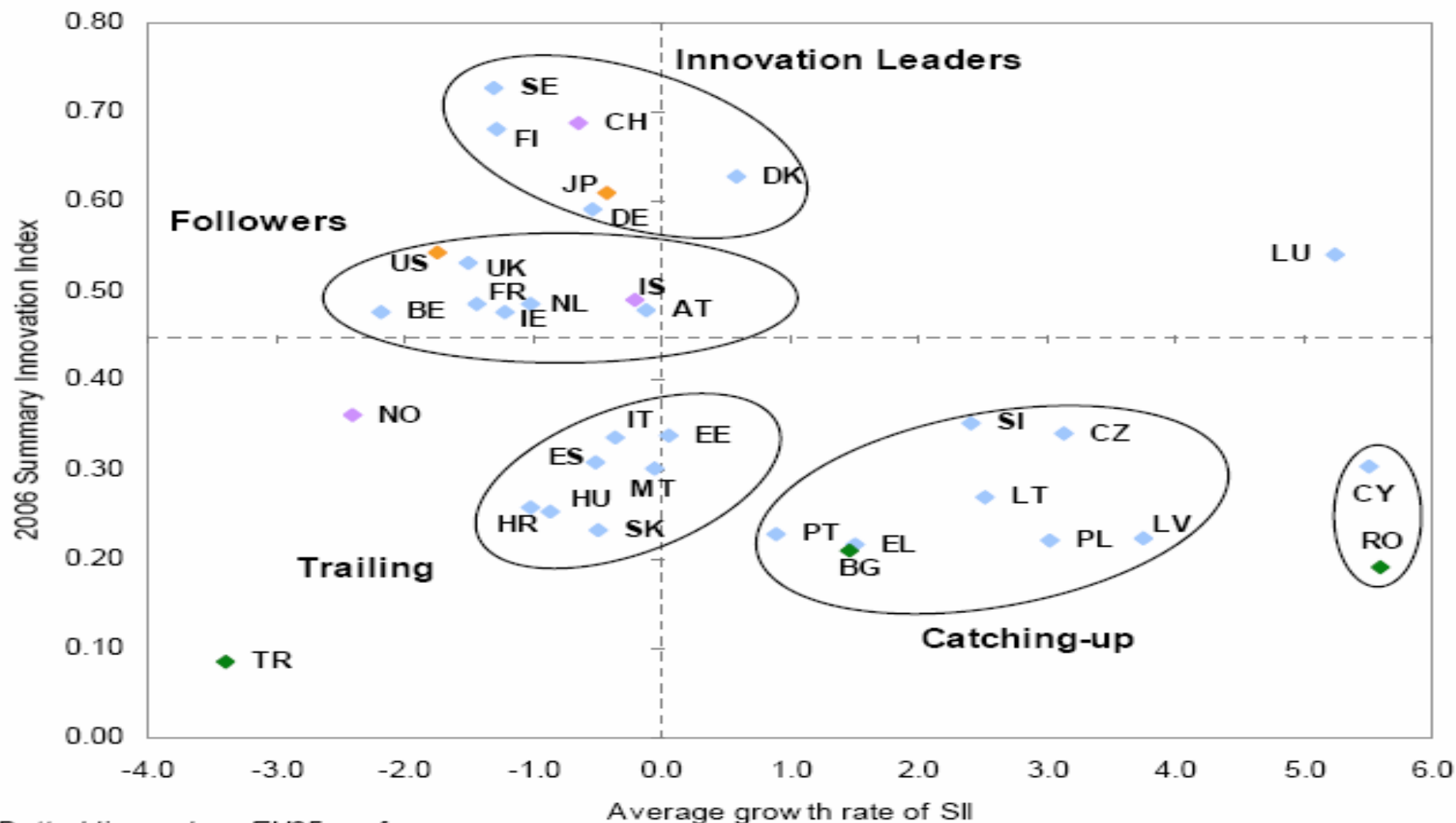
EU INNOVATION SCOREBOARD - 8

THE EU TRAILS in 7 KEY AREAS

- ◆ Business expenditure in R&D (Jap. 2.4% of GDP, US 2%, EU 1.2%)
- ◆ ICT expenditure (Jap. 7.6% of GDP, US 6.7%, EU 6.4%)
- ◆ Broadband penetration rates (Jap. 16 %, US 15%, EU 11%)
- ◆ Tertiary education (US 38%, Jap. 37%, EU 23%)
- ◆ Venture capital investments in early stage of company activity (US 0.072% of GDP, EU 0.023%, Jap. < 0.005%)
- ◆ Total exports of high-tech products (US : 26.8% of total, Japan 22.4%, EU 18.4%) - Rem : China is now leading in volume here!
- ◆ Number of patents granted : US and Japan lead in triadic patents, national patents and even slightly in EPO patents.

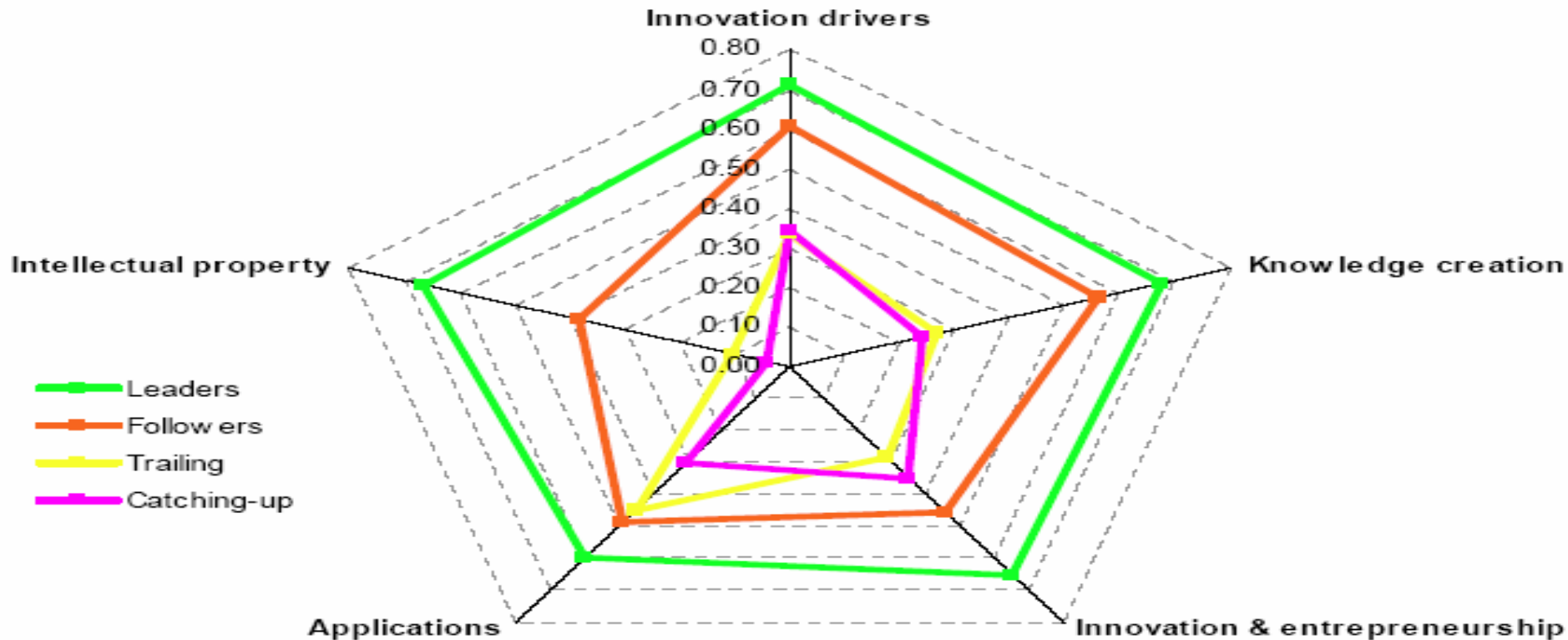
EU INNOVATION SCOREBOARD - 9

BUT THE EU PANORAMA IS VERY VARIED



EU INNOVATION SCOREBOARD - 10

TRAILERS ARE CATCHING UP BUT REMAIN WEAK

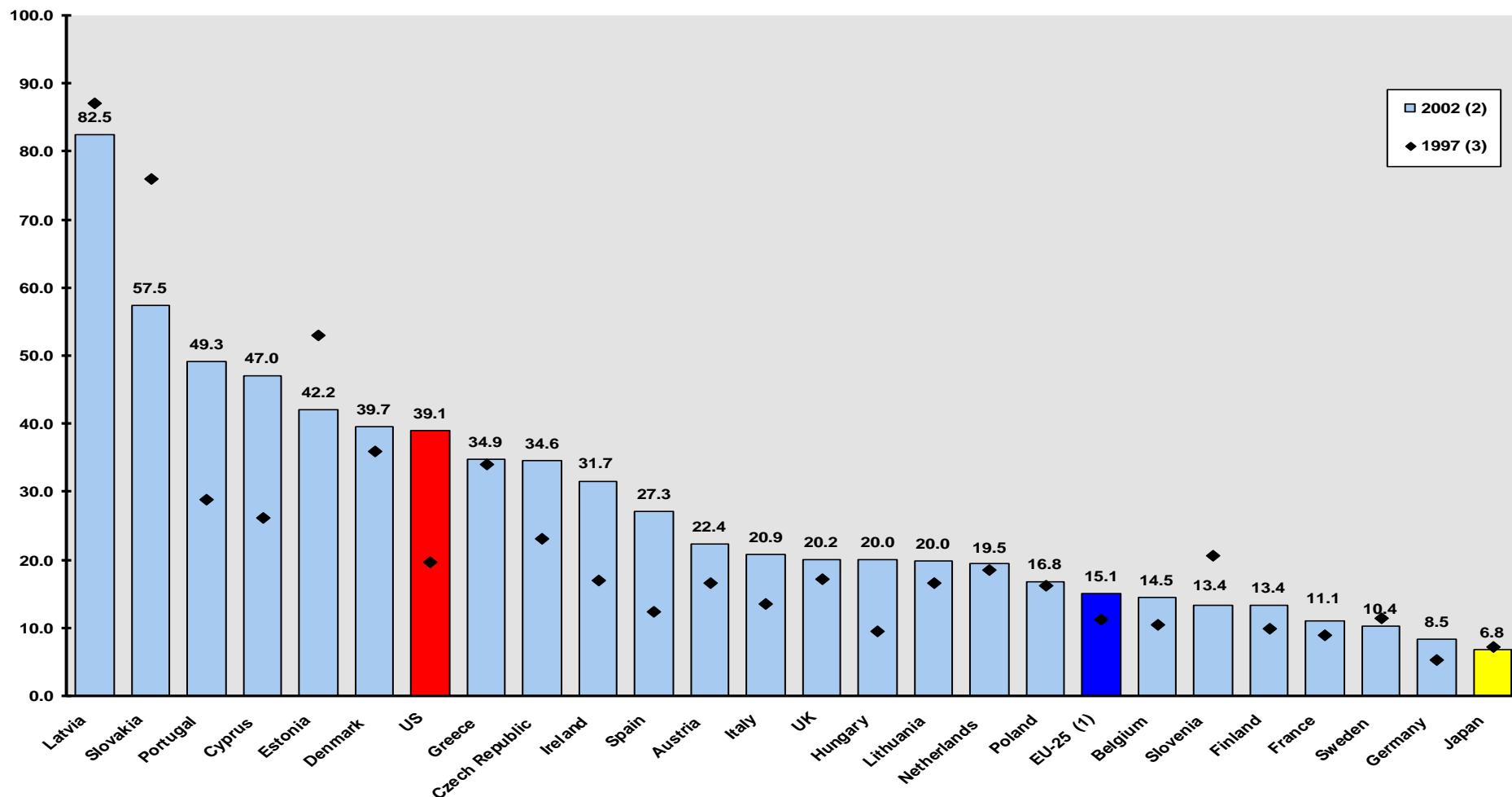


☞ “Leaders & followers”, dominate all 5 dimensions. “Trailing” focus on applications, “Catching-up” on innovation and entrepreneurship

EU INNOVATION SCOREBOARD - 11

MORE RESEARCH IN SERVICES IS NEEDED

Figure 2.3.10 Share of BERD performed in the services sector (%)



“AHO REPORT” - 2006

Service sector and “hidden innovation”

◆ *“Innovation is frequently found in the most unlikely places” :*

- New products, processes and **services** (Public research programmes do not address it : business and technology precede science !!)
- New methods of production (mass customisation) or improving quality
- Major technological improvements are not necessarily technology-based e.g. Distributed engineering at FIAT, 24hr round development at Inbev
- New ways of handling a commodity commercially (e.g. liquified gas)
- Opening of a new market (e.g. Cheap Glasses & GSM in India, eBay...)
- Re-structuring of an industry (monopoly: Easyjet, Skype; Reactivity to market Zara....

◆ **Risk of supplying researchers & innovative services to the US !**

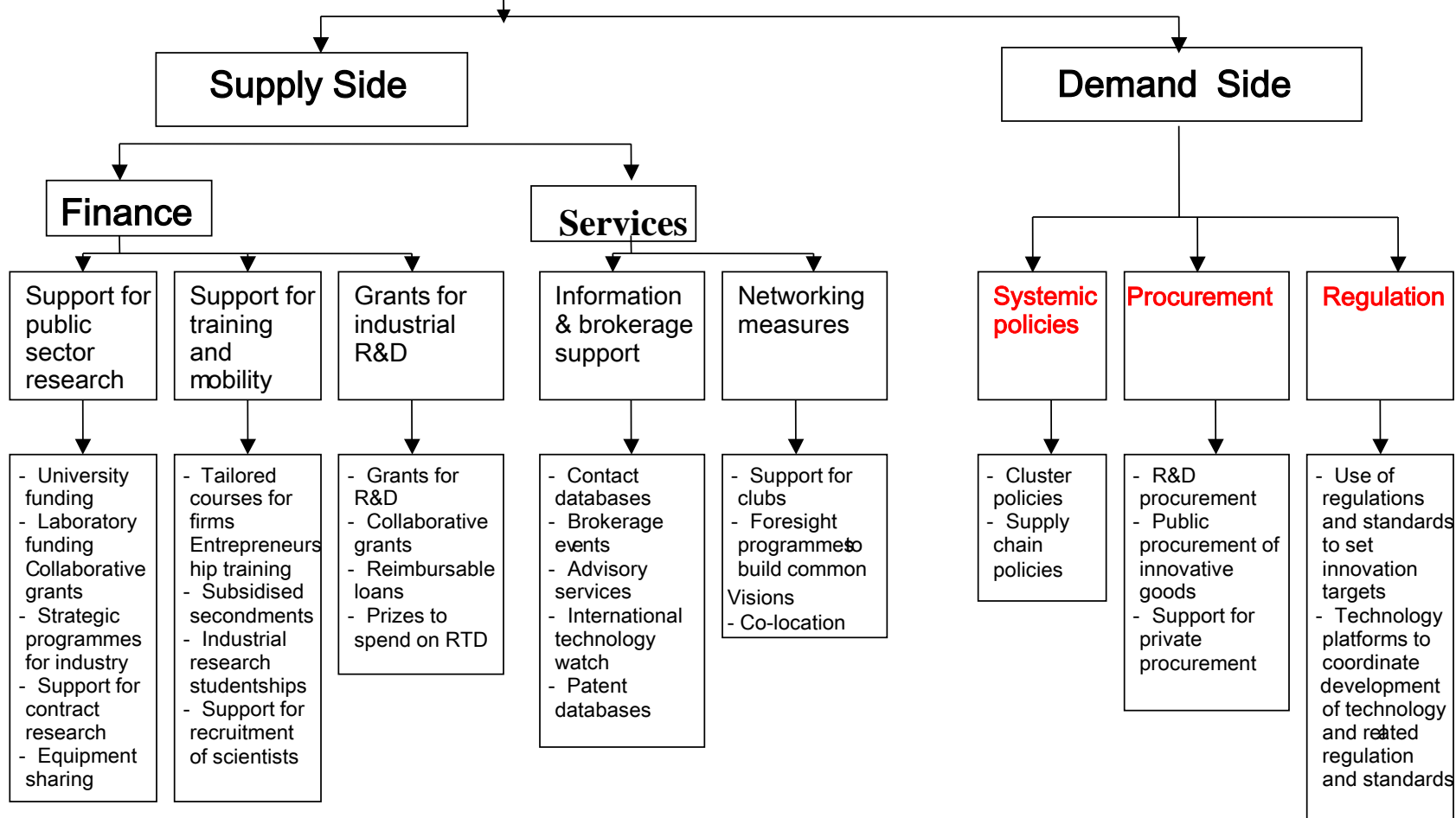
- From 150.000 to 400.000 EU researchers in the US
- The EU paradox : EU researchers develop technologies exploited in US
 - > WWW developed at CERN (TBL)
 - > MP3 developed and patented by Fraunhofer Institute
 - > Skype developed in EU, sold to e-Bay (N.Zennström)

Indirect Measures
ifiscal measures

**DIRECT
MEASURES**

Guarantee Mechanisms

Risk Capital



AHO REPORT (2006) : Framework conditions : Science base - Contract research - Human resources - IPR - State Aid Regulations

2. Growth and Innovation in the EU

2.1 ANALYSIS : THE INNOVATION UNION SCOREBOARD

2.2 RESPONSE : THE INNOVATION UNION(2010-2020)

Why Innovation Union?

- ◆ A cornerstone of **Europe 2020** strategy
- ◆ **Globalisation** of knowledge production and innovation capacities
 - Develop **world-class excellence**
 - **Attract investment** through better support and framework conditions
 - Establish **strategic cooperation with world partners**
- ◆ Impact of the **crisis** on public and private finance, survival of innovative SMEs
- ◆ **Major challenges** to address with reduced means

 ***Innovation emergency!***

What is Innovation Union?

- ◆ **Strategic approach**
- ◆ **Partnership** with Member States
- ◆ Whole chain of innovation: from **blue sky** to market

Tackling weaknesses

- ◆ **Under-investment**
- ◆ **Fragmentation**
- ◆ **Framework conditions**

Building on strengths

- Focus on **societal challenges**
- **Broad concept** of innovation
- Involving **all actors**

☞ **A distinctive European approach to innovation**

Innovation Union highlights

- ◆ European Innovation Partnerships
- ◆ European Research Area framework
- ◆ Streamlined EU programmes
- ◆ New financial instruments
- ◆ Reform of standardisation system
- ◆ Public procurement of innovation
- ◆ Social innovation pilot
- ◆ Stronger monitoring

Innovation Union at a glance

1. Training researchers	2. University ranking system	3. Developing new curricula	4. ERA Framework	5. European Research infrastructures	6. Programmes focusing on EU2020	7. Involvement of SMEs in R&I
8. Forum on Forward Looking Activities	9. EIT to expand its activities	10. New financial instruments for private finance	11. Free Venture Capital funds	12. Cross-border matching of innovative firms	13. Review of State aid R&D&I	14. EU Patent
15. Screening of key regulatory frameworks	16. Modernise standard-setting	17. Pre-commercial and public procurements	18. Eco-innovation action plan	19. European Design Board	20. Open access	21. Knowledge transfer
22. European market for patents and licensing	23. Safeguard of IPRs	24. Smart Specialisation	25. Focus on Innovation in next Structural Funds	26. European Social innovation pilot	27. RTD programmes on public sector & social innovat°	28. Partners consultation on knowledge economy
29. European Innovation Partnerships	30. Policies for researchers to reside in Europe	31. Scientific cooperation with third countries	32. International agreements on RTD infrastructures	33. MS to carry out self assessments	34. New indicator: fast-growing companies & monitoring	

On line information & monitoring systems

The Innovation Union Information and Intelligence System



<http://i3s.ec.europa.eu/>

Get involved in the Innovation Union

- ◆ Innovation Union website
- ◆ <http://ec.europa.eu/research/innovation-union/>
- ◆ Innovation Union Facebook page
- ◆ <http://www.facebook.com/Innovation.Union>
- ◆ Innovation unlimited blog
- ◆ <http://blogs.ec.europa.eu/innovationunlimited>

Innovation Union - ERA – Horizon 2020

