Information Society Indicators and Indices

A proposal for new indices

Karsten Gareis / Tobias Hüsing / Norbert Kordey / Werner B. Korte / Hannes Selhofer

Gesellschaft für Kommunikations- und Technologieforschung mbH
Bonn, Germany
info@empirica.com

European Foundation Workshop

Dublin
12-13 Dec. 2001

Table of content

- SIBIS Project
- Proposals for Indices
  - Toward a Digital Divide Index
  - Toward a flexibility in work index
  - eEurope E-Commerce Index
- Summary & outlook

empirica

ist

SIBIS

Statistical Indicators Benchmarking the Information Society

empirica

DANISH TECHNOLOGICAL INSTITUTE

DATABANK CONSULTING

Technopolis

RAND Europe

wrc

Fachhochschule Solothurn Nordwestschweiz
Technik-Wirtschaft-Soziales

SIBIS project (IST-2000-26276) (1/2001 - 6/2003)

- Main contractor:

  empirica (D)

- Partners:

  Work Research Centre (IRL), FHSO (CH), Dansk Teknologisk (DK), Technopolis (UK), Databank Consulting (I), RAND Europe (NL)

- Objectives:
  - Development and testing of statistical indicators benchmarking progress towards the IS (incl. USA)
  - Evaluation of e-Europe actions
  - Benchmarking of achievements and progress

SIBIS Topic Areas

- No. 1: Telecommunications and access
- No. 2: Internet for research
- No. 3: Security and trust
- No. 4: Education
- No. 5: Work, employment and skills
- No. 6: Social inclusion
- No. 7: e-Commerce
- No. 8: e-Government
- No. 9: Health

SIBIS project milestones & results

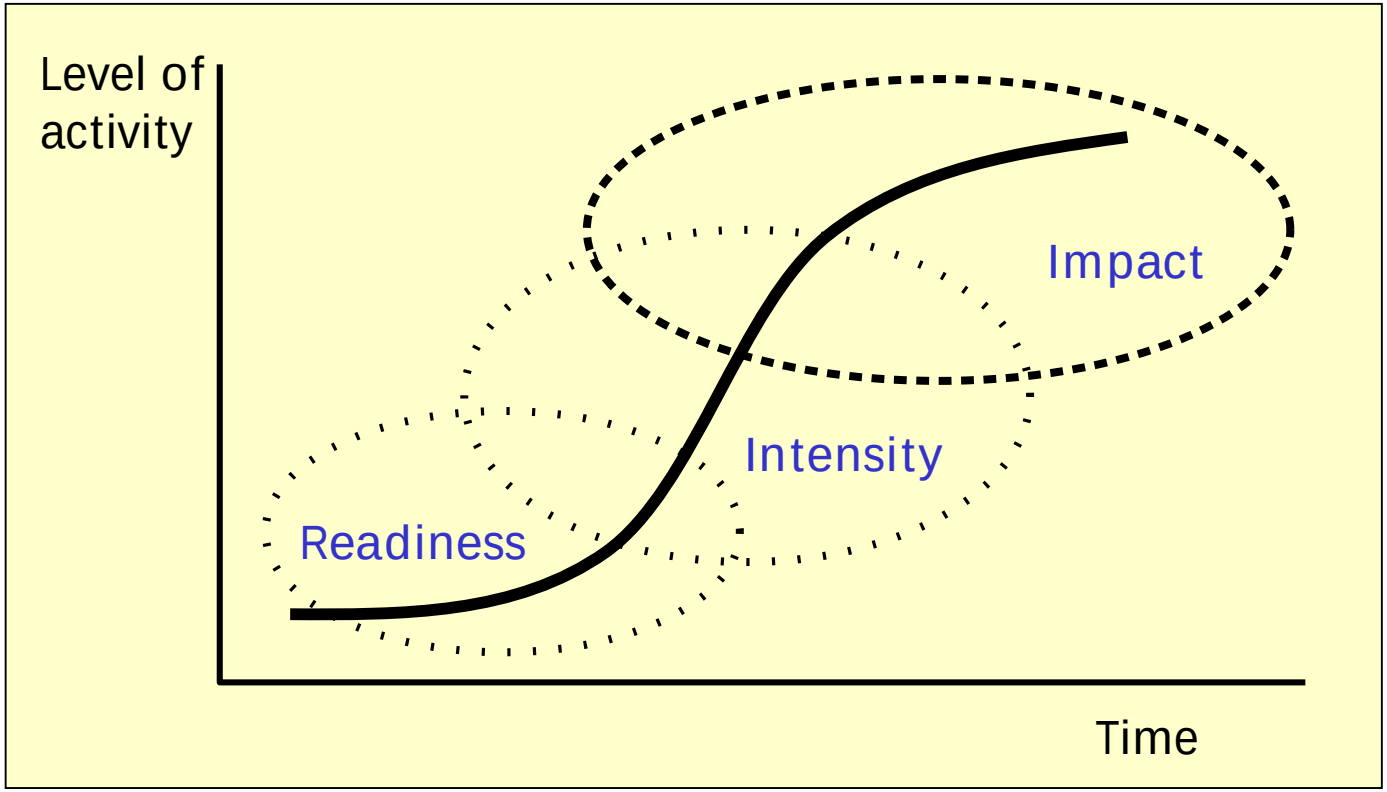
- e-Europe Benchmarking Framework
- 9 IS Topic Reports
- ~ 50 e-Europe statistical indicators and calculation of component statistics to be tested in surveys
- General Population Survey of 8,000 citizens in the EU (and the USA)
- Decision Maker Survey of 5,000 establishments in the EU
- e-Europe Indicator Handbook
- Advisory Group of Experts (AGE)
- Evaluation and benchmarking of key e-Europe actions
- SIBIS website and e-Europe Indicator Database
- International SIBIS Conference (probably as part of an IST conference)

Established vs. innovative indicators

- **Traditional / established indicators**
  - data collected by official statistical organisations on a regular basis, usually long-term data series available
  - high degree of international standardisation in definitions and data collection
- **Innovative indicators**
  - definition recently developed or currently under development, often for a highly specific purpose
  - data either not yet fully available or calculated, or piloted for the first time in surveys
  - candidates to become traditional indicators
- **New indicators (!!!)**
  - indicators specifically developed by the SIBIS project

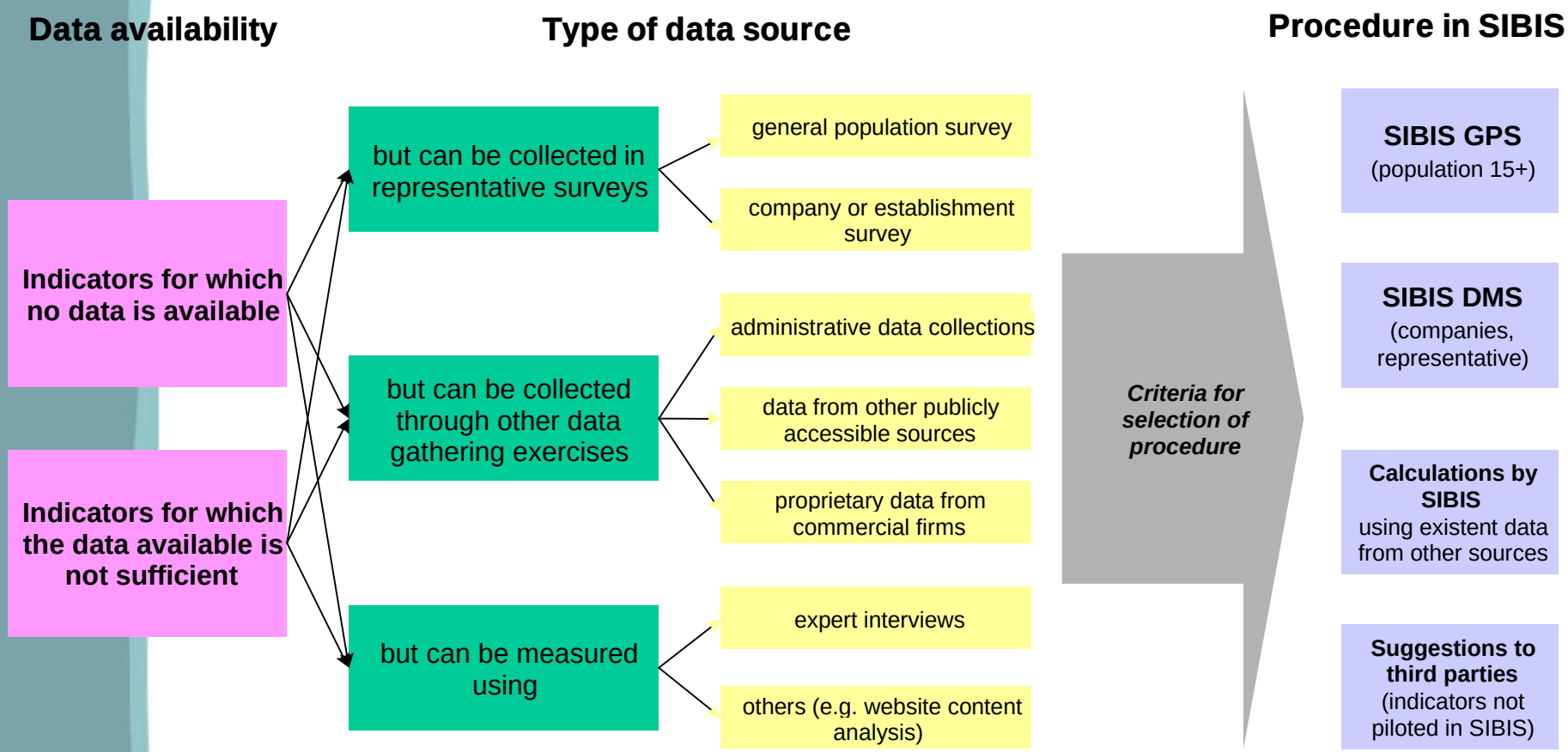
Indicator development by market maturity

Market maturity determines research interest and needs: WPIIS Model for eCommerce indicators

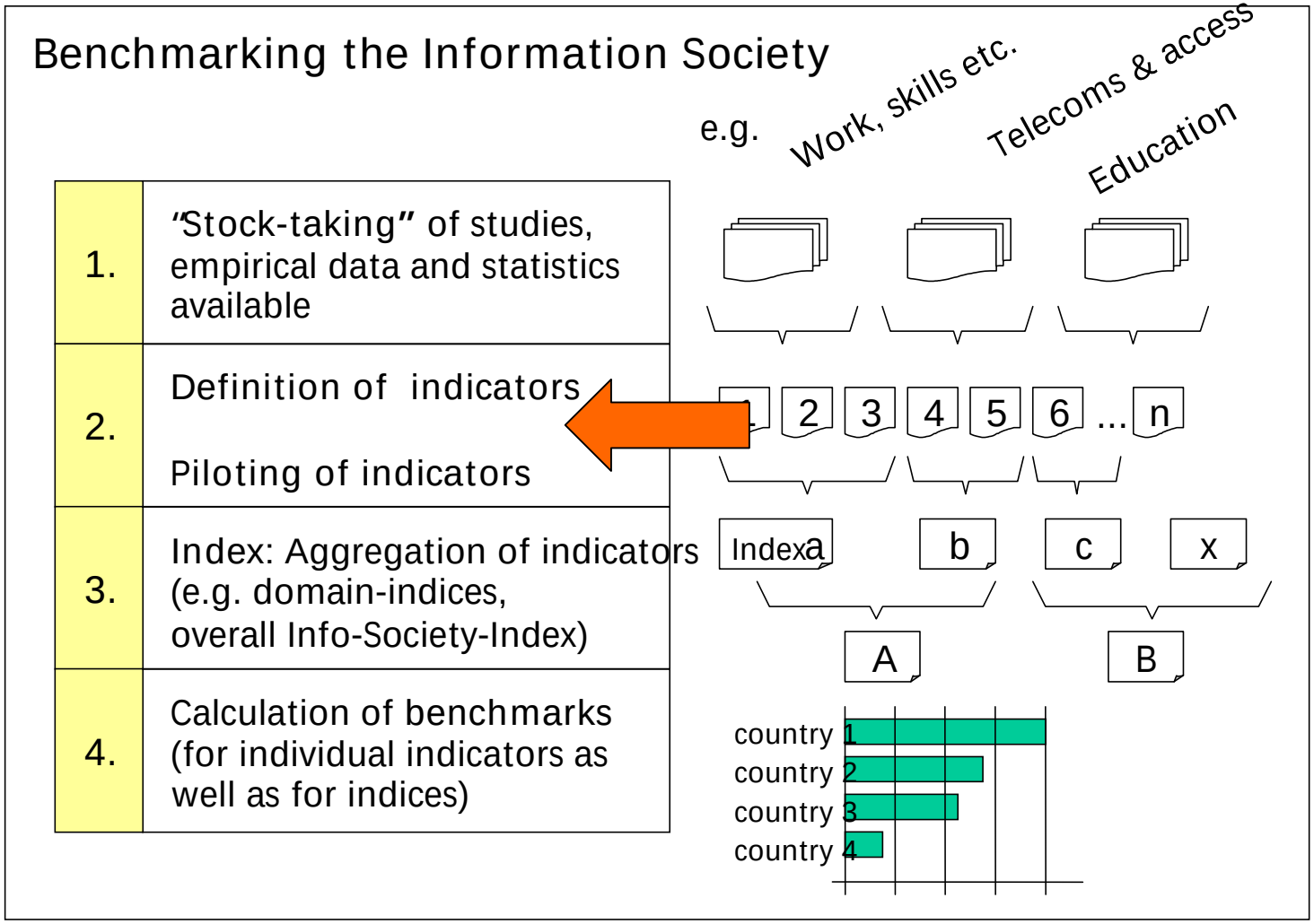


WPIIS = OECD Working Party on Indicators of the Information Society

Indicator development and testing



Methodology



Proposals for Indices

Digital Divide Index

The “Digital Divide” - a definition

“ . . . the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access information and communication technologies (ICTs) and to their use of the internet for a wide variety of activities.”

OECD (2001): Understanding the Digital Divide

1970: The “knowledge gap theory”

"Segments of the population with higher socio-economic status tend to acquire information at a faster rate than the lower status segments so that the gap in knowledge between these segments tends to increase rather than decrease.”

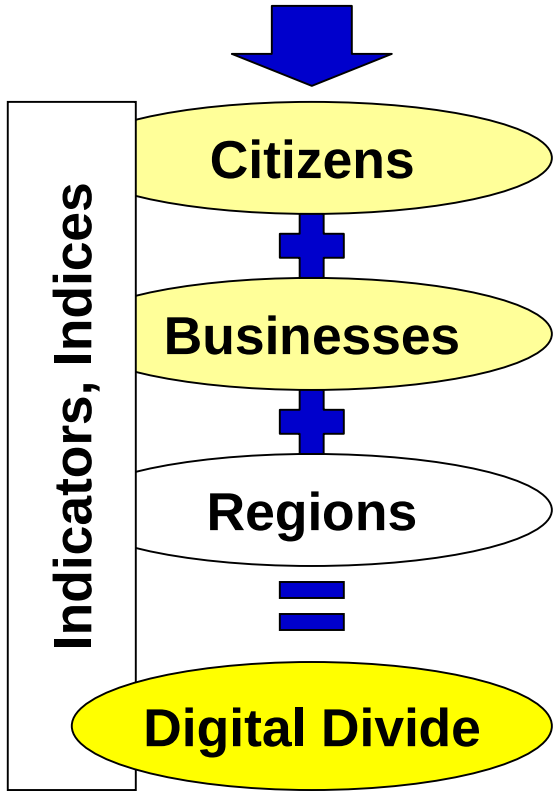
Tichenor, P. J. / Olien, C. N. / Donohue, G. A. (1970). Mass media flow and differential growth in knowledge. Public Opinion Quarterly, 34: 159-170.

“Why bother about it?” - 3 reasons:

- **Employability**
  - **Basic ICT skills are an indispensable requirement for a growing number of jobs**
- **Equal participation of citizens in the information society**
  - **not having ICT access or skills will increasingly be a disadvantage in day-to-day life (e.g. online banking & booking)**
- **Economic reasons (demand side economics):**
  - **off-liners and non ICT-literate parts of the population are likely not to be e-consumers**

Focus of current statistics about the digital divide(s)

EU focus	US focus	Extended perspective
Aggregate comparison of **EU countries**	• age gap • gender gap • income gaps • education gap • location gap (urban / rural) • ethnicity gap • (other)	
on EU level: • age gap • gender gap • income gaps • education gap		

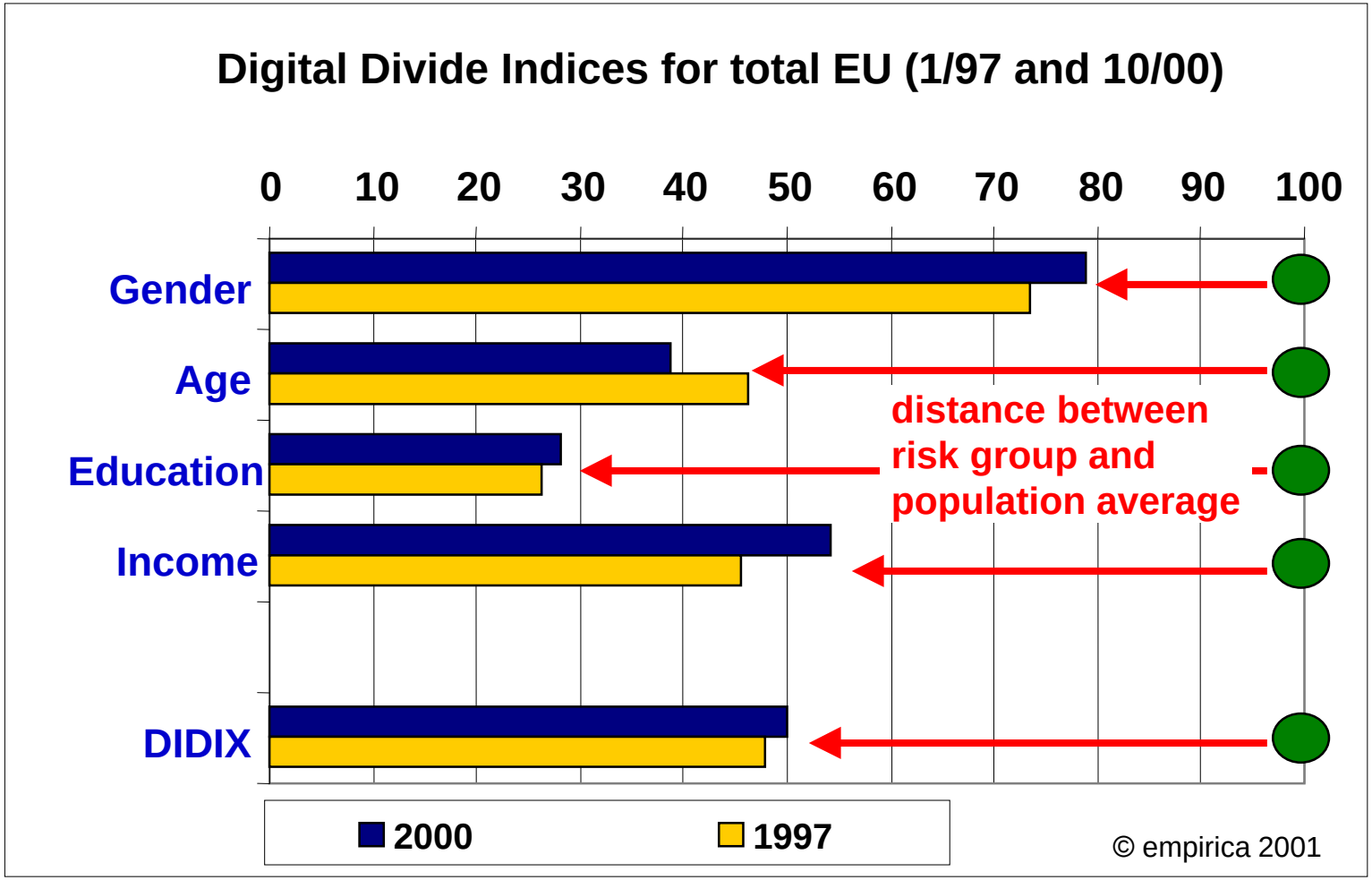


Measuring the digital divide in the society: a pilot for 4 risk groups

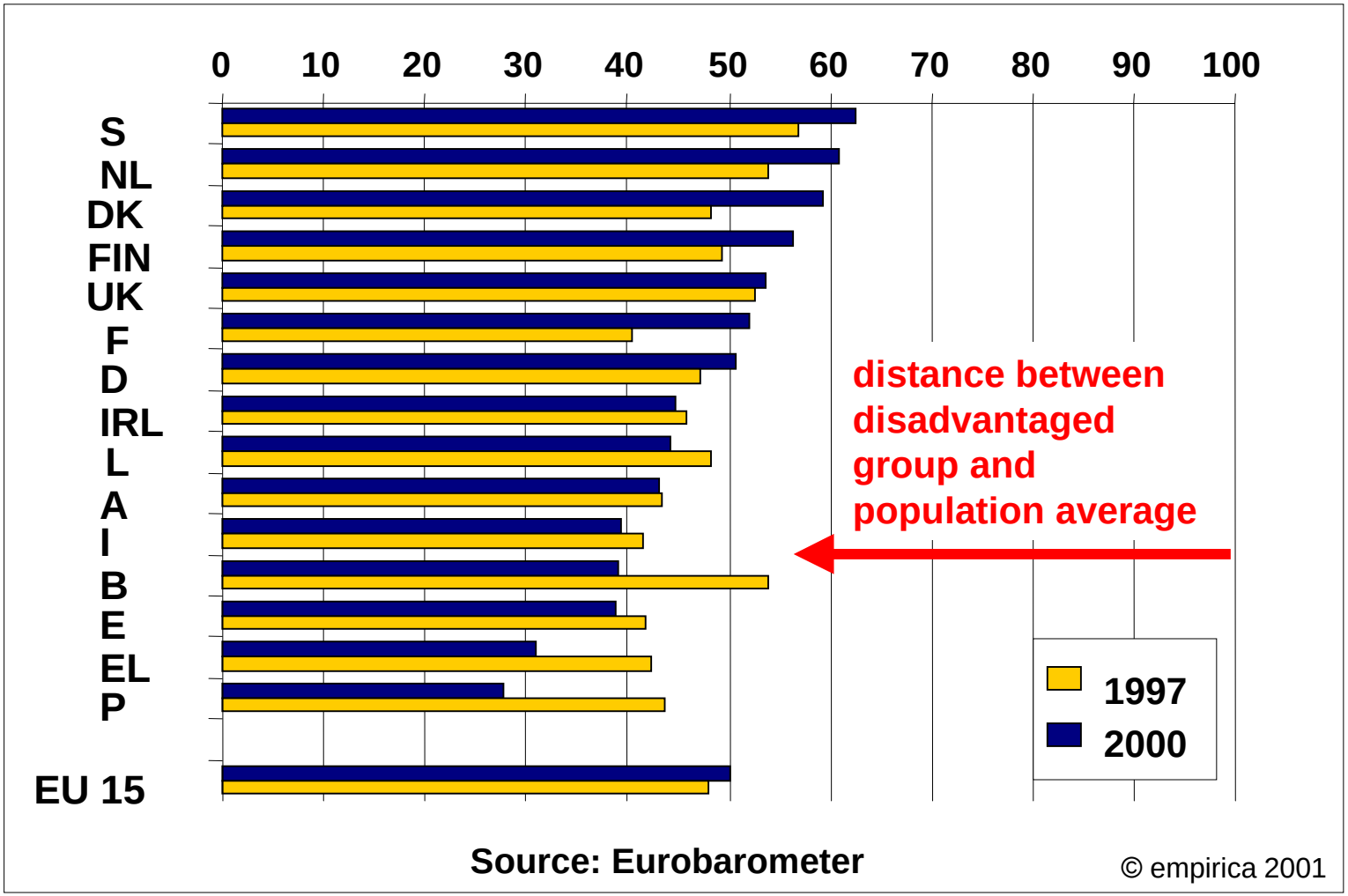
The policy focus is on the presumably disadvantaged segments of society ("risk / disadvantaged groups"):

- **The Gender dimension**
  - Risk group: **women**
- **The Age dimension**
  - Risk group: **elderly people** (in this study defined as "50+ years old")
- **The Education dimension**
  - Risk group: **low education** (= formal education finished at age of ≤ 15 years)
- **The Income dimension**
  - Risk group: **low income** (= lowest quartile)

The compound Digital Divide Indices on EU Level (1997 / 2000)



The “DIDIX” 2000: Comparison of Member States



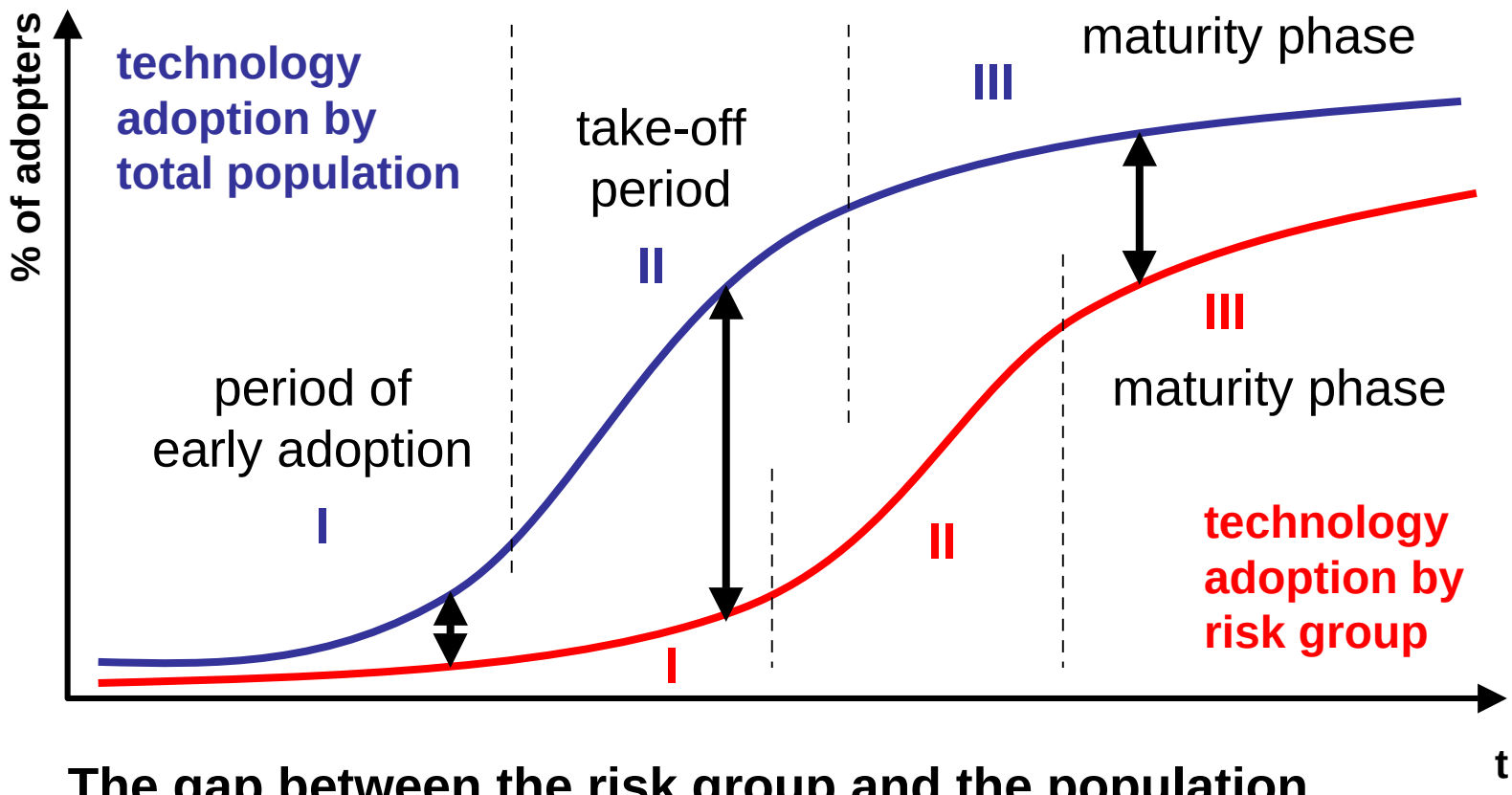
Summary

- **The Digital Divide Index** (= diffusion ratio risk group / population average) **has stagnated between 1997** (48) **and 2000** (50).
- **But the dynamic was a different one in the four dimensions analysed in this pilot study:**

	Index 97	Index 00	Change %
Gender	**73**	**79**	**+ 8.2 %**
Age	**46**	**39**	**- 15.2 %**
Education	**26**	**28**	**+ 7.7 %**
Income	**45**	**54**	**+ 20.0 %**

Note: perfect equality = Index of 100

Explanation based on diffusion theory



The gap between the risk group and the population average will (normally) increase at first and decrease once the risk group has entered the take-off period.

Proposals for Indices

Adaptability of Work Arrangements Index

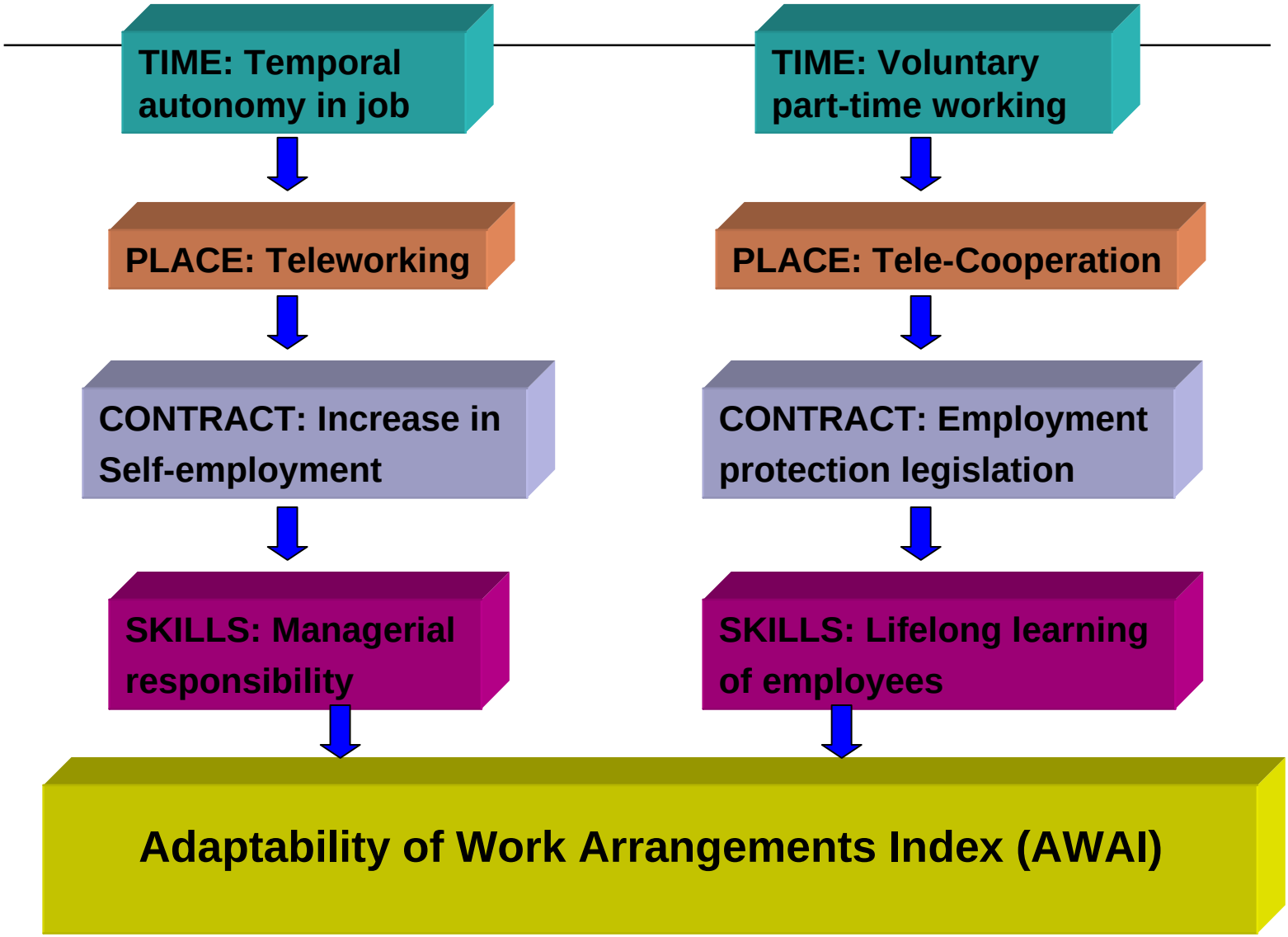
Dimensions of Change in Work Arrangements: Trends

Time	9 to 5	flexitime
Place	co-location	dislocation
Contract	employed	self-employed
Applied skills	stable, clear-cut	dynamic, complex

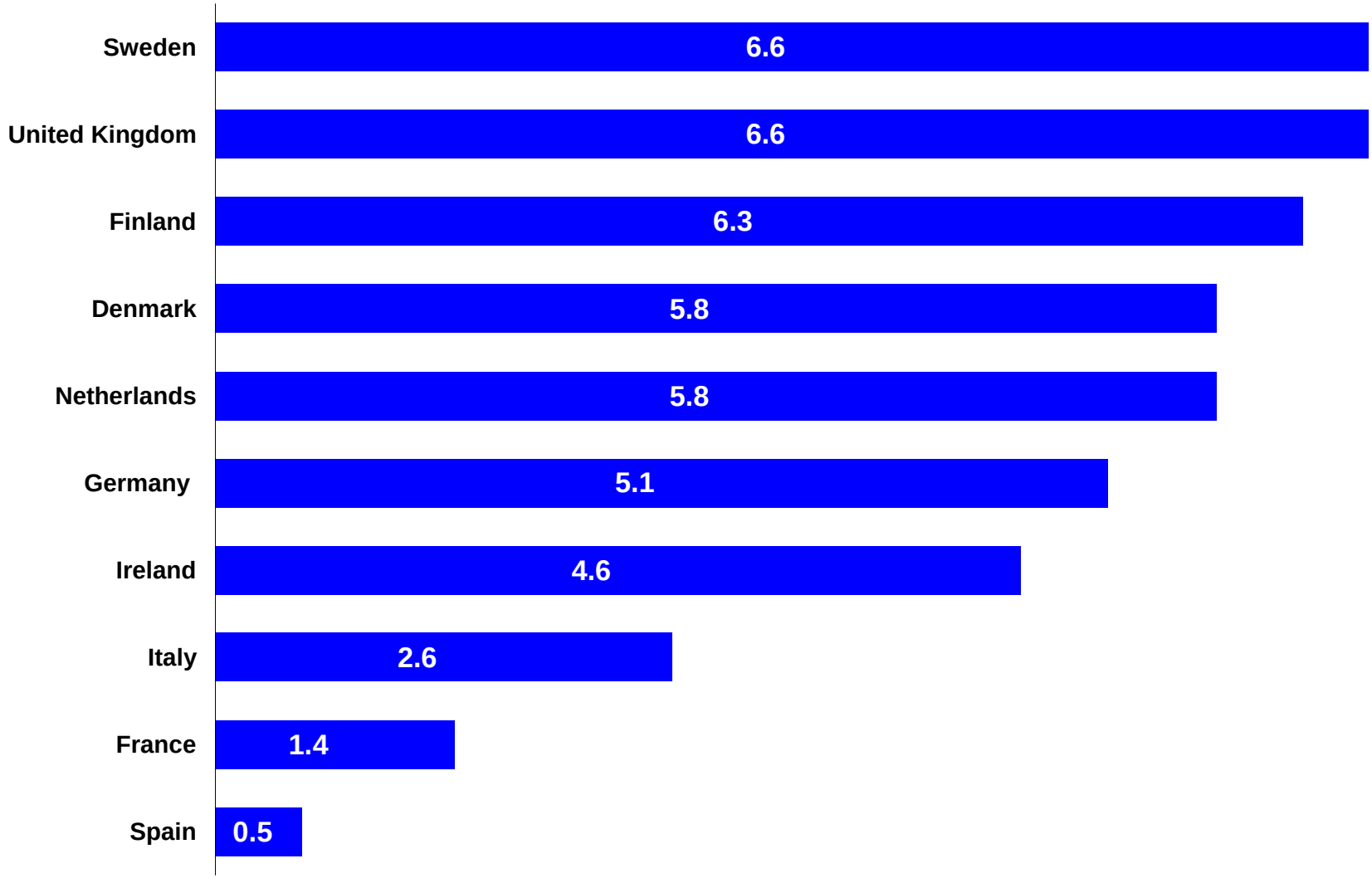
Indicators for Measuring Change and Adaptability

Dimension	Indicator	Definition	Year	Source
Time	Voluntary part-time working	Voluntary part-time workers in % of total labour force	1999	Eurostat (LFS)
Time	Temporal autonomy in job	% of total labour force with discretion over start/finish of working time	1999	Empirica ECaTT
Place	Teleworking	All teleworkers in % of labour force	1999	Empirica ECaTT
Place	Tele-cooperation	Workers who tele-cooperate as % of all workers	1999	Empirica ECaTT
Contract	Increase in self-employment	Increase in the share of self-employed in % of total employment 1989-1999	1988/1998	Eurostat (LFS); IAB
Contract	Employment protection legislation	Employment Protection Legislation Indicator by OECD	1998	OECD
Applied skills	Managerial responsibility	Workers with managerial responsibility in work in % of total labour force	1999	Empirica ECaTT
Applied skills	Lifelong learning of employees	Percentage of employees, aged 30-39, who have participated in training over the 4 weeks prior to the survey.	1999	Eurostat (LFS)

From Indicators to Index



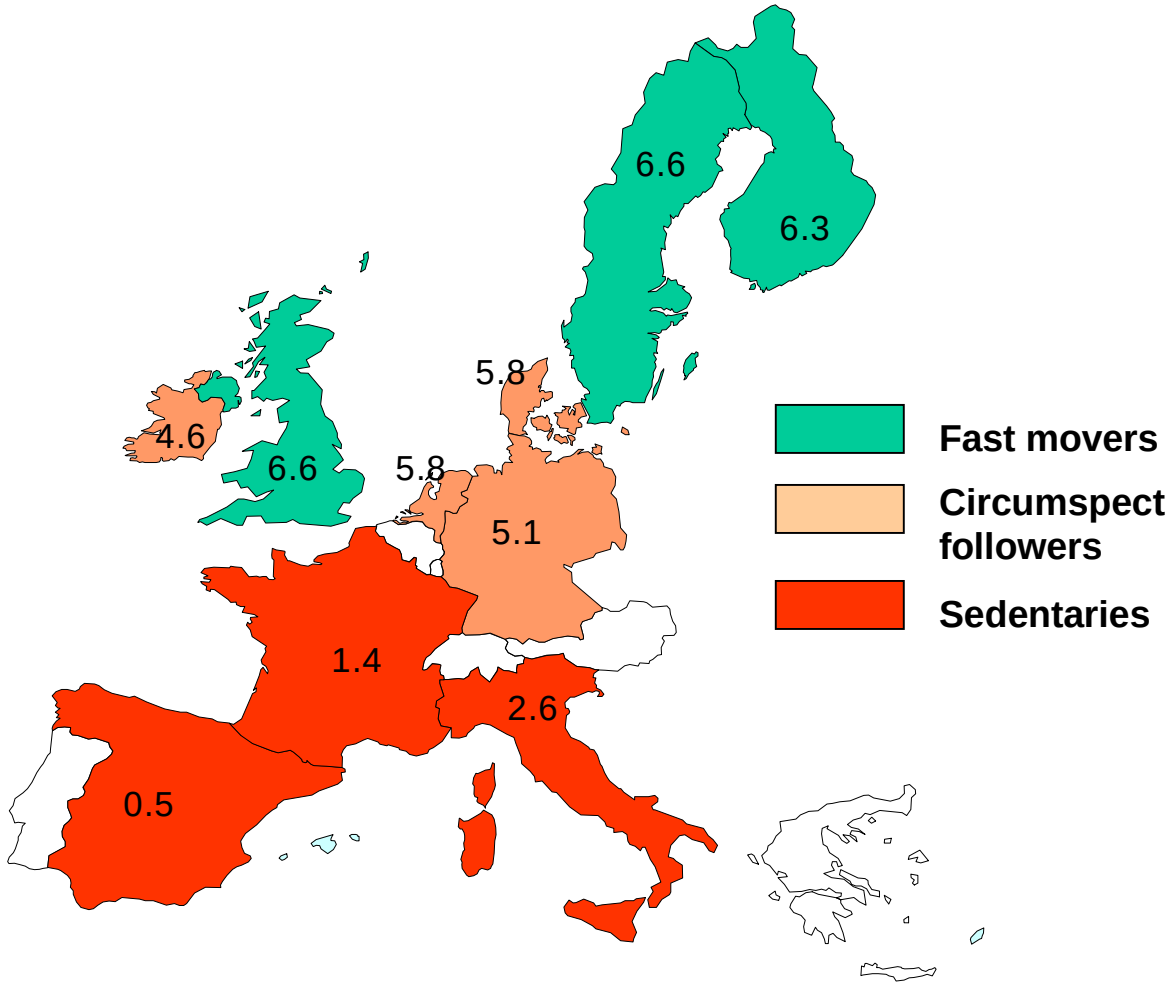
AWAI Index Results



AWAI Index Calculation Results

Dimension	TIME		PLACE		CONTRACT		APPLIED SKILLS			
Indicator	Voluntary part-time working	Temporal autonomy in job	Teleworking	Tele-Cooperation	Employment Protection in Legislation	Self-employed	Managerial Responsibility	Lifelong learning of employees	AWAI Index[1]	Overall rank
Sweden	44	75	90	75	65	100	79	100	***6.63***	**1**
United Kingdom	59	74	45	85	100	69	100	92	***6.63***	**1**
Finland	20	100	100	100	71	76	70	88	***6.25***	**3**
Denmark	46	82	63	63	82	69	77	85	***5.75***	**4**
Netherlands	100	77	86	90	65	69	76	69	***5.75***	**4**
Germany	44	82	36	64	58	97	86	23	***5.13***	**6**
Ireland	39	75	26	75	91	55	93	35	***4.63***	**7**
Italy	13	81	21	54	49	93	63	23	***2.63***	**8**
France	33	63	17	53	53	35	76	8	***1.38***	**9**
Spain	16	70	17	48	51	3	60	19	***0.50***	**10**

AWAI Index Results



AWAI Index Results

Fast Movers
Sweden, UK, Finland

- **Highly adaptable, dynamic labour markets**

Circumspect Followers
Denmark, Netherlands
Germany, Ireland

- **Solid middle group which attempt to combine (positive) aspects from the past and future**

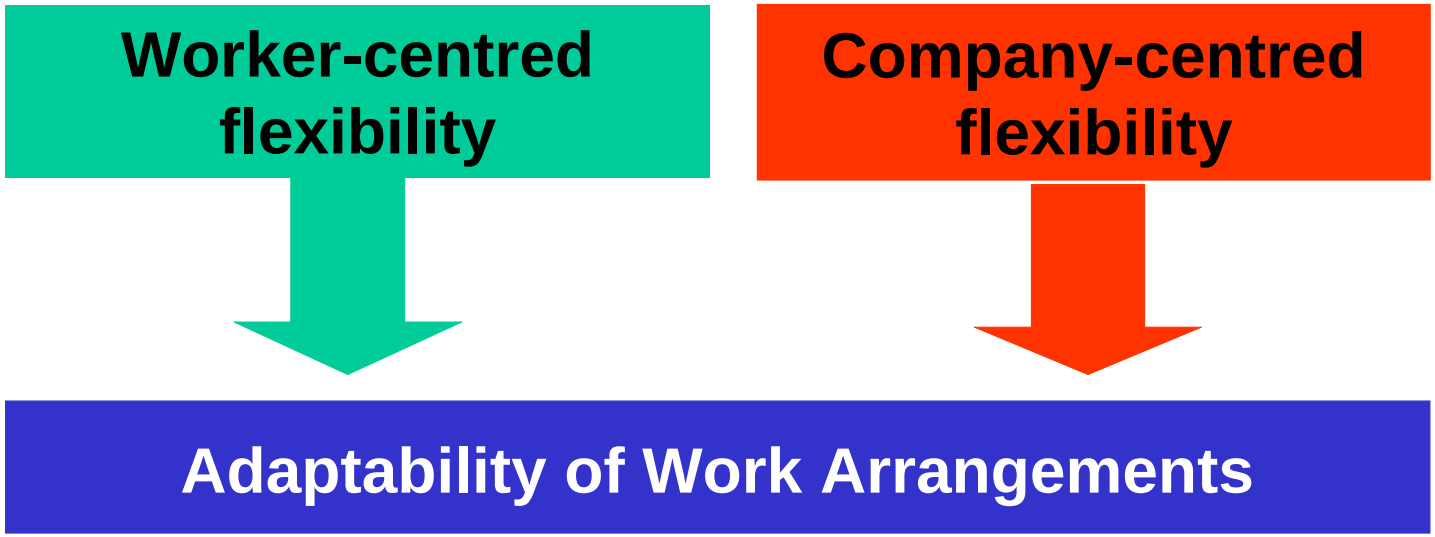
Sedentaries
Italy, France, Spain

- **Slow movers, running the danger to loose contact to developments in the rest of the European Union**

What has changed since the first draft?

- **Discussion with indicator experts and policy-makers at EU and Member State level**
- **Selection of indicators revised to more adequately reflect European Employment Strategy objectives**
- **Need to distinguish between worker-centred and company-centred flexibility**
- **Use of data from European Foundation (European Survey on Working Conditions)**

What has changed since the first draft?



Indicators for Measuring Worker-centred Flexibility of Work Arrangements

Time	• Voluntary part-time working • Temporal autonomy in job
Place	• Home-based Teleworking • Teleworkability
Contract	• Job security (satisfaction with) • Job tenure
Applied skills	• Participation in lifelong learning • Participation in decision-making

Indicators for Measuring Company-centred Flexibility of Work Arrangements

Time	• Part-time working • Atypical working times
Place	• Tele-cooperation • Mobile teleworking
Contract	• Employment protection legislation • Temporary work contracts (voluntary)
Applied skills	• Training provided by employer • Management by objectives

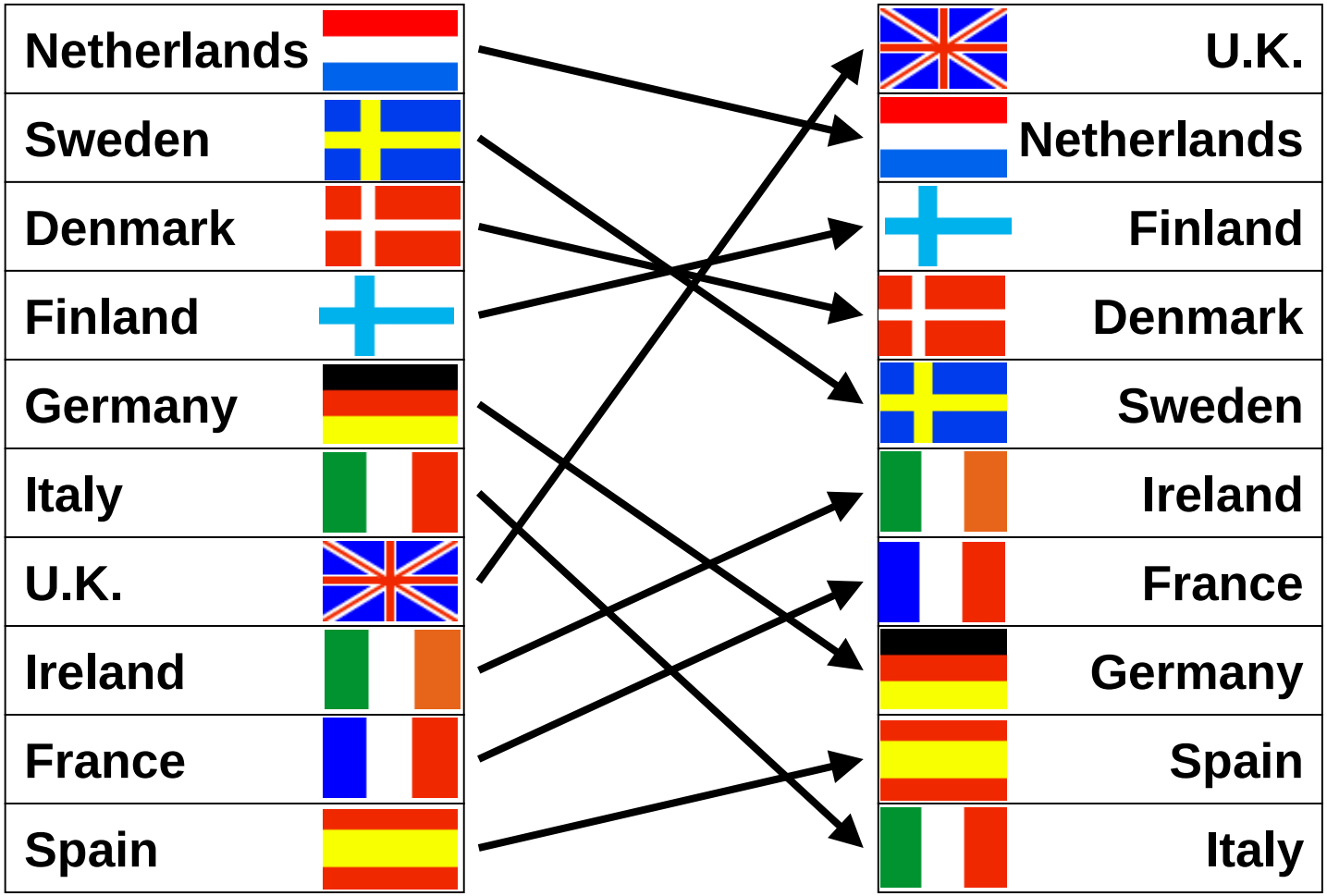
AWAI Index Calculation Results:
Worker-centred flexibility

Dimension	TIME		PLACE		CONTRACT		CONTENT			
Indicator	Voluntary part-time working	Discretion over working time	Home-based teleworking	Teleworkability	Job security	Job tenure	Participation in decision making	Lifelong learning	AWAI-2 Worker-centred Flexibility Index[1]	Country rank
Netherlands	100	77	60	99	94	79	100	72	6.63	1
Sweden	44	75	79	76	87	95	88	100	6.13	2
Denmark	46	82	67	73	100	70	98	96	5.88	3
Finland	20	100	100	83	87	83	97	91	5.88	3
Germany	44	82	22	93	88	85	75	24	5.13	5
Italy	13	81	24	100	86	100	67	24	4.63	6
U.K.	59	74	36	92	84	69	86	97	4.50	7
Ireland	39	75	15	75	84	78	76	24	2.50	8
France	33	63	18	85	77	93	80	13	2.38	9
Spain	16	70	19	87	83	83	56	23	2.00	10

AWAI Index Calculation Results:
Company-centred flexibility

Dimension	TIME		PLACE		CONTRACT		CONTENT			
Indicator	Part-time working	Atypical working hours	Mobile teleworking	Tele-Cooperation	Employment Protection in Legisla-tion	Involuntary temporary workers	Management by Objectives	Employee training provided by company	AWAI-2 Company-centred Flexibility Index[1]	Country rank
U.K.	57	86	49	85	100	14	85	96	6.63	1
Netherlands	100	72	100	90	58	39	96	84	6.63	1
Finland	20	84	60	100	64	37	69	100	6.00	3
Denmark	47	70	49	63	78	14	100	89	5.13	4
Sweden	44	73	53	75	58	37	56	80	4.63	5
Ireland	35	85	7	75	89	6	69	67	4.00	6
France	31	83	19	53	42	43	71	47	3.50	7
Germany	43	75	35	64	49	21	56	56	3.38	8
Spain	16	100	12	48	40	100	67	36	3.00	9
Italy	14	93	33	54	38	21	65	42	2.38	10

AWAI Index Calculation Results: Comparison between both subindices



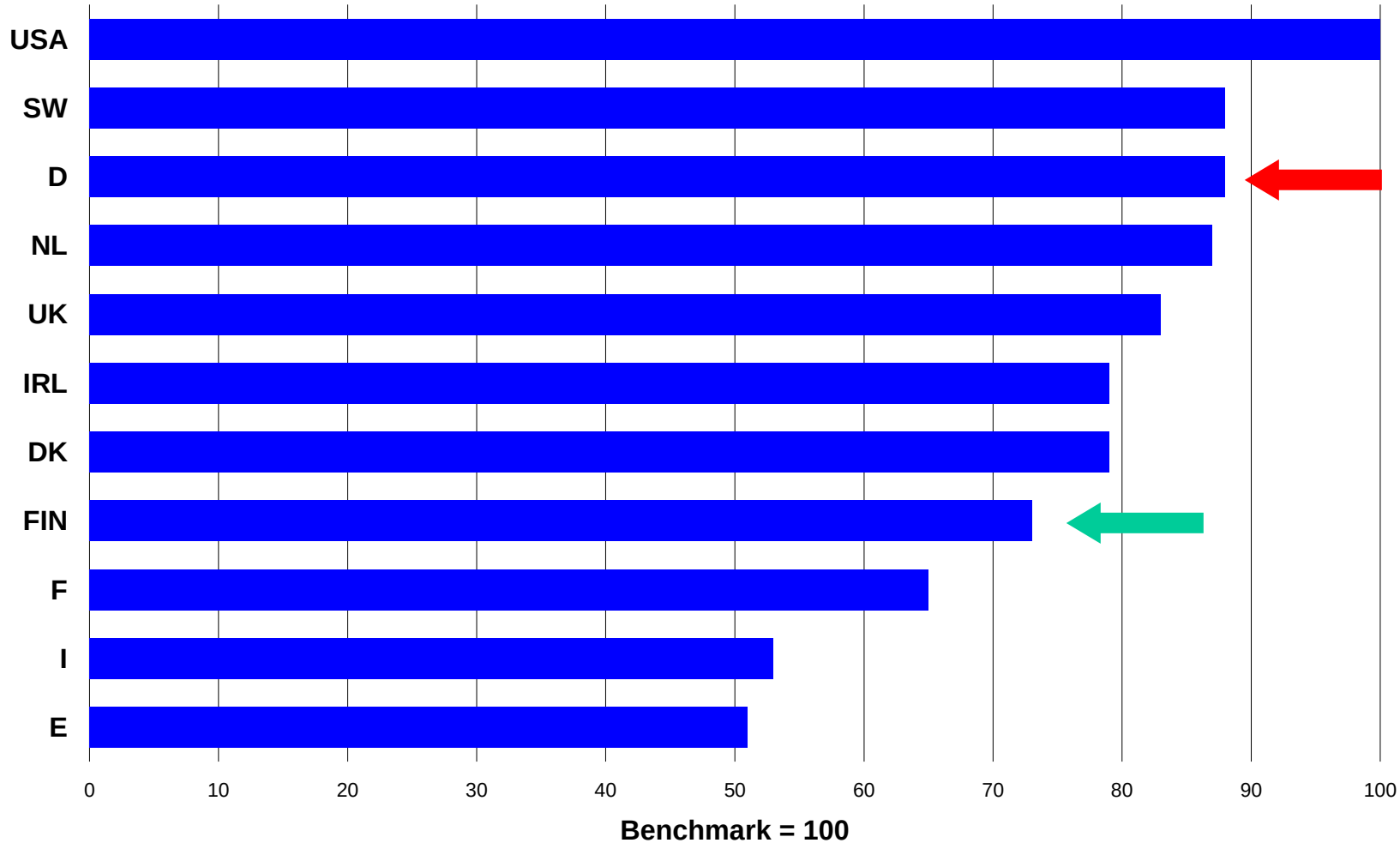
Proposals for Indices

eEurope E-Commerce Index

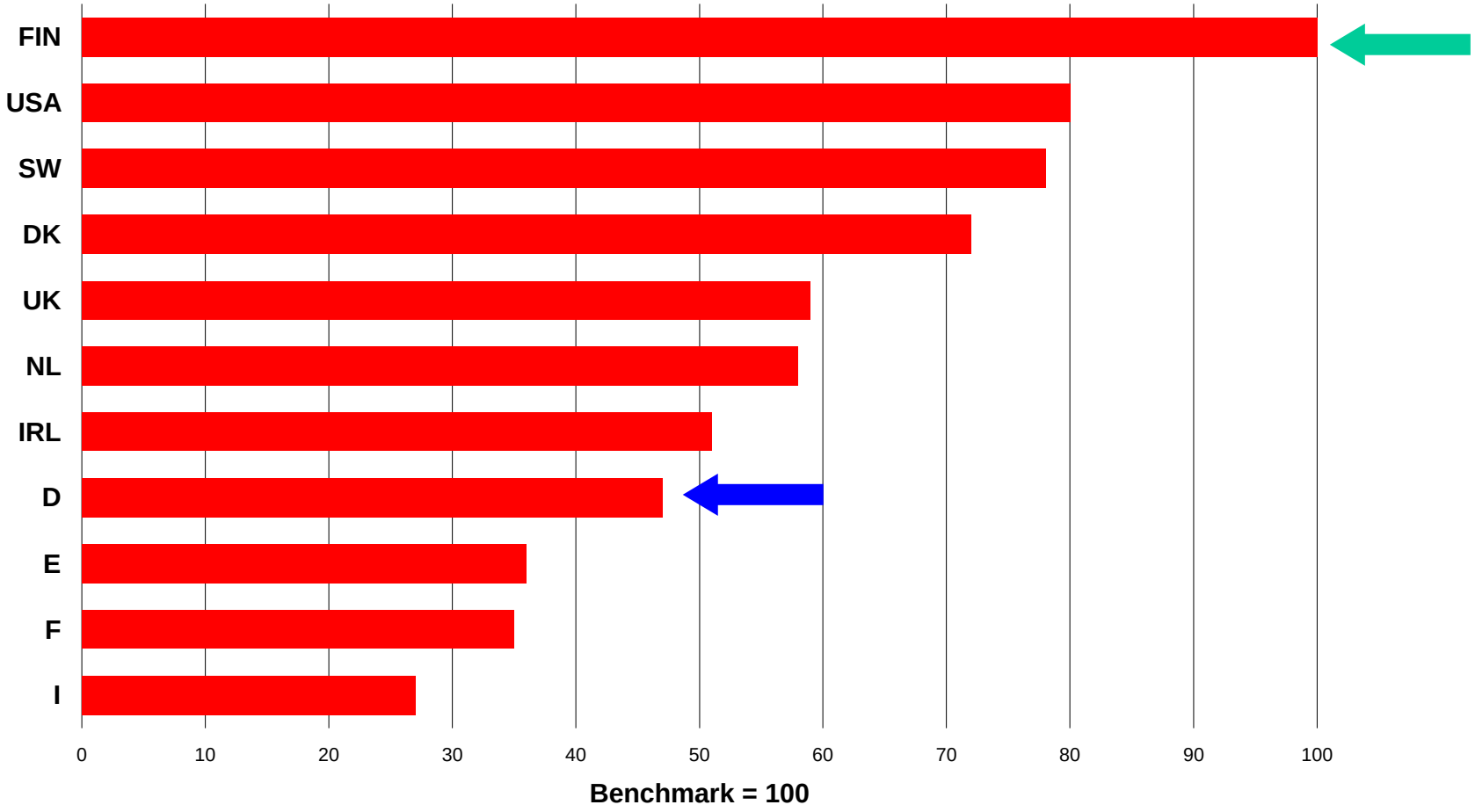
E-Commerce Potential and Use Indices

Variables used for construction of e-Europe E-COMMERCE INDEX	
Usage Index	**Potential Index**
1. Internet infrastructure: - Internet hosts 2. Internet access: - Internet use in establishments - Internet presence of establishments - private use of Internet in households 3. E-Commerce offer/supply: - establishments practising marketing via Internet - online sales by establishments - online data exchange with suppliers etc. 4. E-Commerce demand: - online purchasing by establishments - online shopping by population - online banking by population	1. Personal preferences: - turnover in mail order shopping - credit card use - TV consumption 2. media competence / qualification/ education: - PC penetration - Knowledge of English language - Percentage of population with higher school education 3. economic structure: - share of employees in business services - transport volumes / GDP - export rate 4. Technical infrastructure: - investment in telecommunications - broadband access by households - ISDN in households 5. Conditions for delivery of goods: - level of urbanisation - service quality of postal services

E-Commerce Potential Index



E-Commerce Use-Index



Selected IST projects dealing with aspects of the digital divide

- **SIBIS (www.sibis-eu.org)**
  - Innovative statistical indicators for benchmarking the information society. One of the topics deals with “social inclusion”. 1/2001 - 6/2003
- **BISER (www.biser-eu.org)**
  - Statistical information society indicators for European regions (NUTS II). 12/2001 - 12/2003
- **SeniorWatch (www.seniorwatch.de)**
  - Study on the use of new technologies by seniors (50+)
- **BEEP (www.beep-eu.org)**
  - collects “best eEurope practices” in four domains (e.g. “social inclusion”). 2/2001 - 7/2003

Final remark

- This presentation is based on "research in progress".
- We would appreciate your feedback and critical comments - please mail to

werner.korte@empirica.com

Thank you!

Thank you very much for your attention!

For more information please visit:

http://www.sibis-eu.org

http://www.ecatt.com

http://www.empirica.com

or contact:

empirica Gesellschaft für Kommunikations-
und Technologieforschung mbG
Oxfordstr. 2
D-53111 Bonn
Tel.: (+49) 2 28 - 9 85 30-0
Fax: (+49) 2 28 - 9 85 30 -12
Email: info@empirica.com
http://www.empirica.com