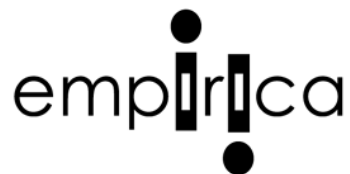

Measuring the Digital Divide

A proposal for a new index

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 - Policy relevance
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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.

2000: The “digital divide”

"It is a precondition for better economic performance that we create a society with greater social cohesion and less exclusion. [...]"

The emergence of new information and communication technologies constitutes an exceptional opportunity, provided that the risk of creating an ever-widening gap between those who have access to the new knowledge and those who do not is avoided."

from: **European Council** on Employment and Social Policy, Introductory Note to the "Objectives in the fight against poverty and social exclusion", 17 October 2000

“Why bother about it?”

- **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
- **Efficient public services:**
 - for efficient e-government, e-health, e-education etc. a digitally literate public is a prerequisite . Hence, traditional service delivery can concentrate on those who cannot use e-services

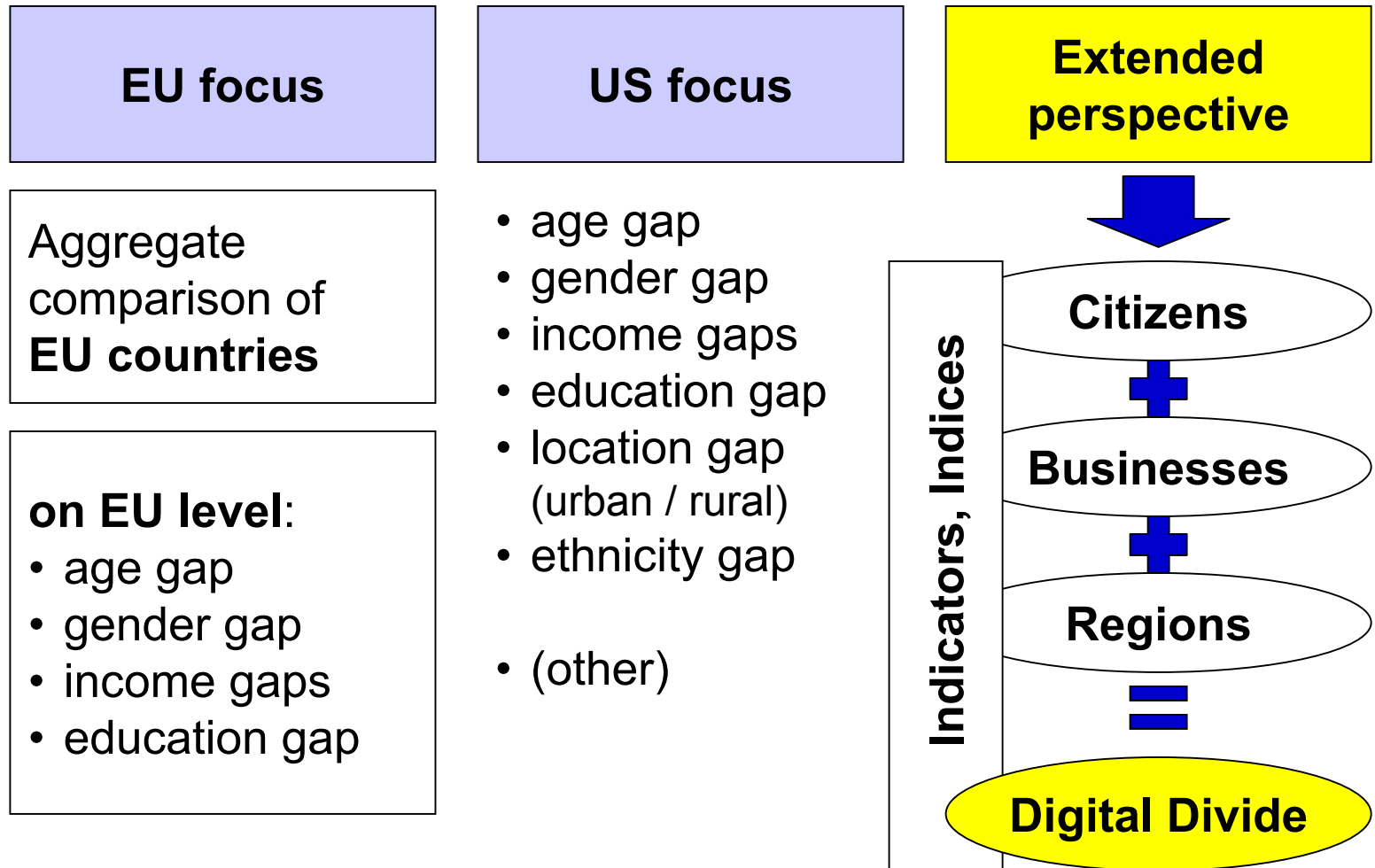
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- **Introduction**
- **Toward a Digital Divide Index**
 - A methodological framework
 - Initial results
- **Summary & outlook**

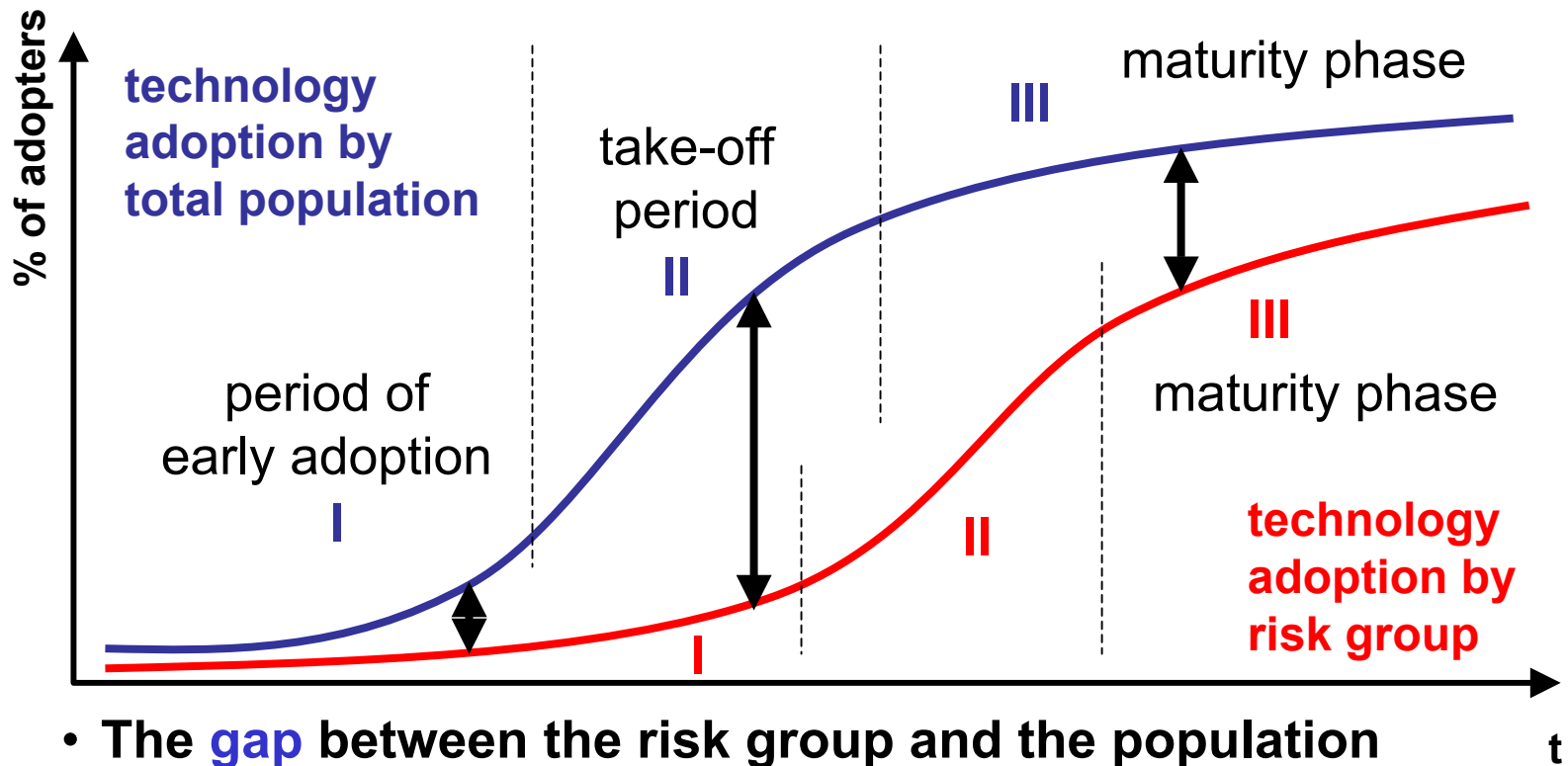
Dimensions of the digital divide(s)

<i>Unit of observation</i>	Citizens individuals / households	Businesses and organisations	Regional units e.g. countries
<i>Independent variables (examples)</i>	<ul style="list-style-type: none"> • age • gender • income • education • location • ethnicity 	<ul style="list-style-type: none"> • sector • number of employees • turnover • location 	<ul style="list-style-type: none"> • location • GDP/capita • size • population • language
<i>Indicators (examples)</i>	<ul style="list-style-type: none"> • Access to and/or usage of ICT & internet • Skills in using ICT • ICT infrastructure (e.g. of businesses / regions) 		

Focus of current statistics about the digital divide(s)



Model 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.
- Simple deterministic logistic curve modelling would expect only increasing **ratios** over time, however.

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**)

Wishlist of indicators

ICT usage: readiness, intensity and impact

- **Readiness:**
 - **literacy, attitudes, infrastructural availability**
 - **available functionality rather than technique**
- **Intensity:**
 - **frequency indicators that are more fine-grained than a user/non-user dichotomy**
- **Impact:**
 - **value judgements about desirable vs. non-desirable usage?**
 - **Indicators for different benefits for different users?**

BUT : No micro-data available yet

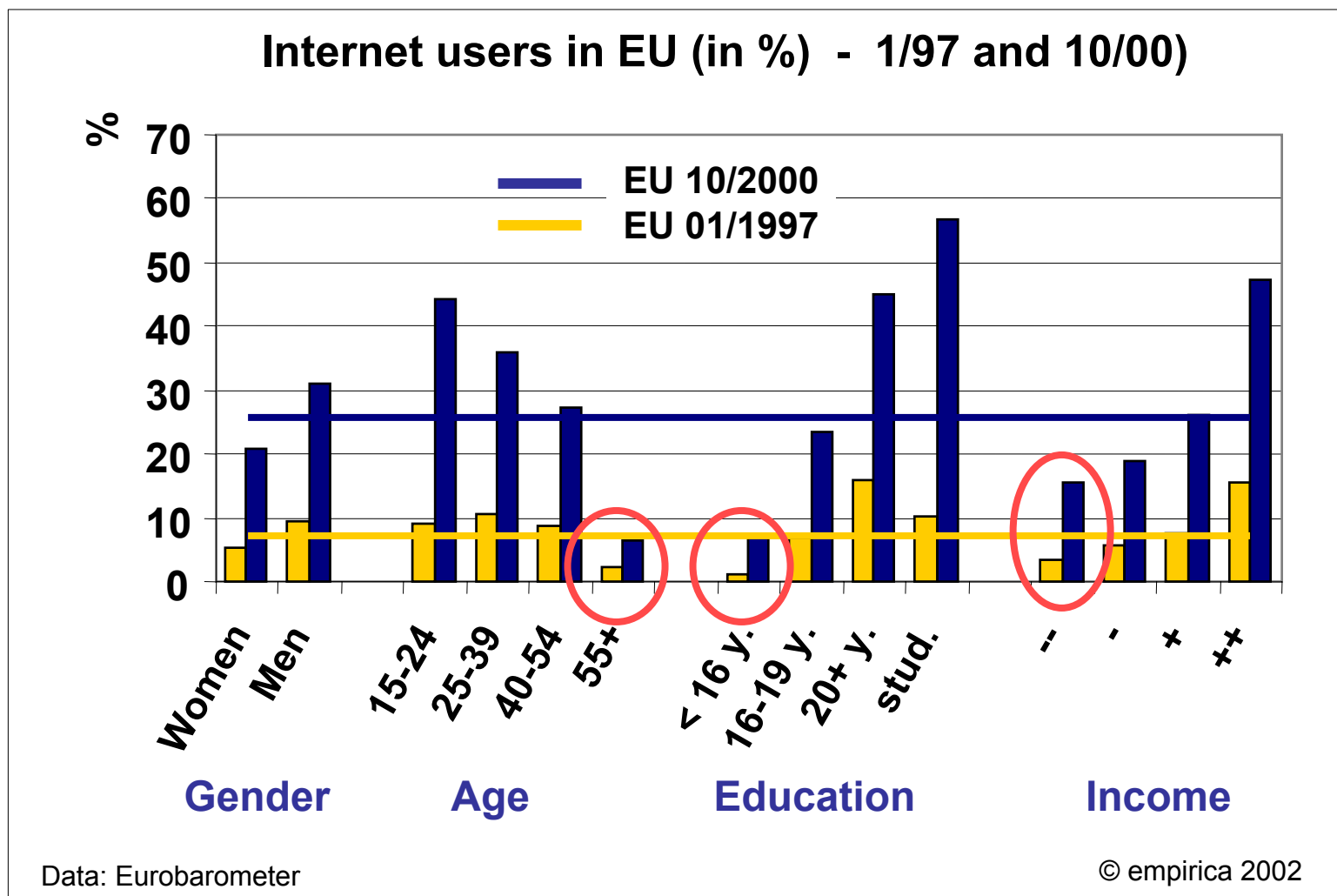
Selected indicators

- **four indicators selected to build the composite index: data availability driven choice of indicators, but core indicators for current digital divide paradigm**
- **data: Eurobarometer surveys (1997, 2000)**

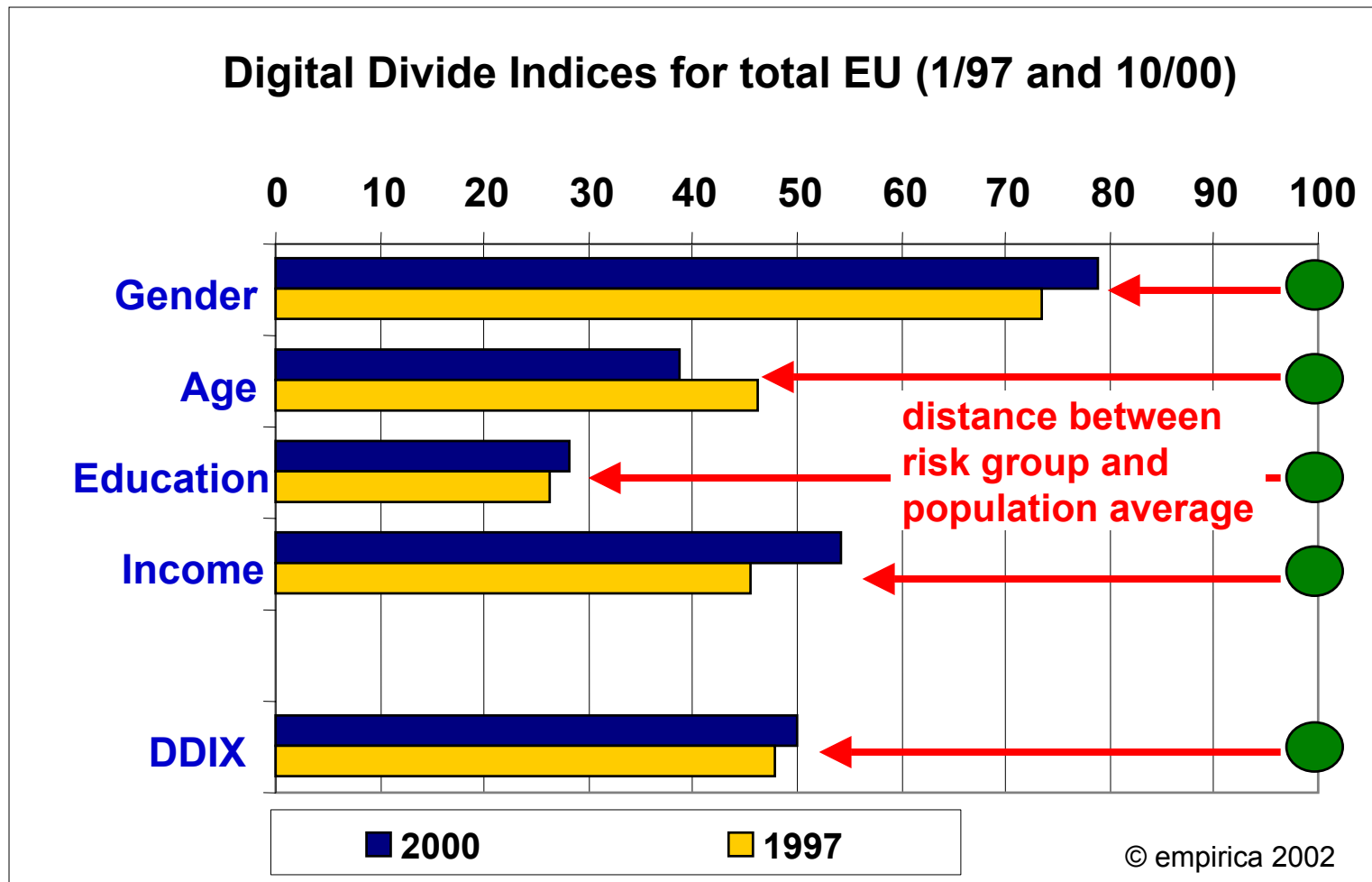
Indicators

- 1: Percentage of **computer** users
- 2: Percentage of people who use a **computer at home**
- 3: Percentage of **internet** users
- 4: Percentage of people who use **internet at home**

Internet users (total EU)



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



Comparison of the 4 selected indicators

EU Digital Divide Indices by indicator (2000)

	Risk groups / population average			
	Gender	Age	Educ.	Income
Computer	87	44	34	57
Computer at home	83	43	31	56
Internet	81	37	26	60
Internet at home	59	29	21	40
Compound (weighted)	79	39	28	54

© empirica 2001

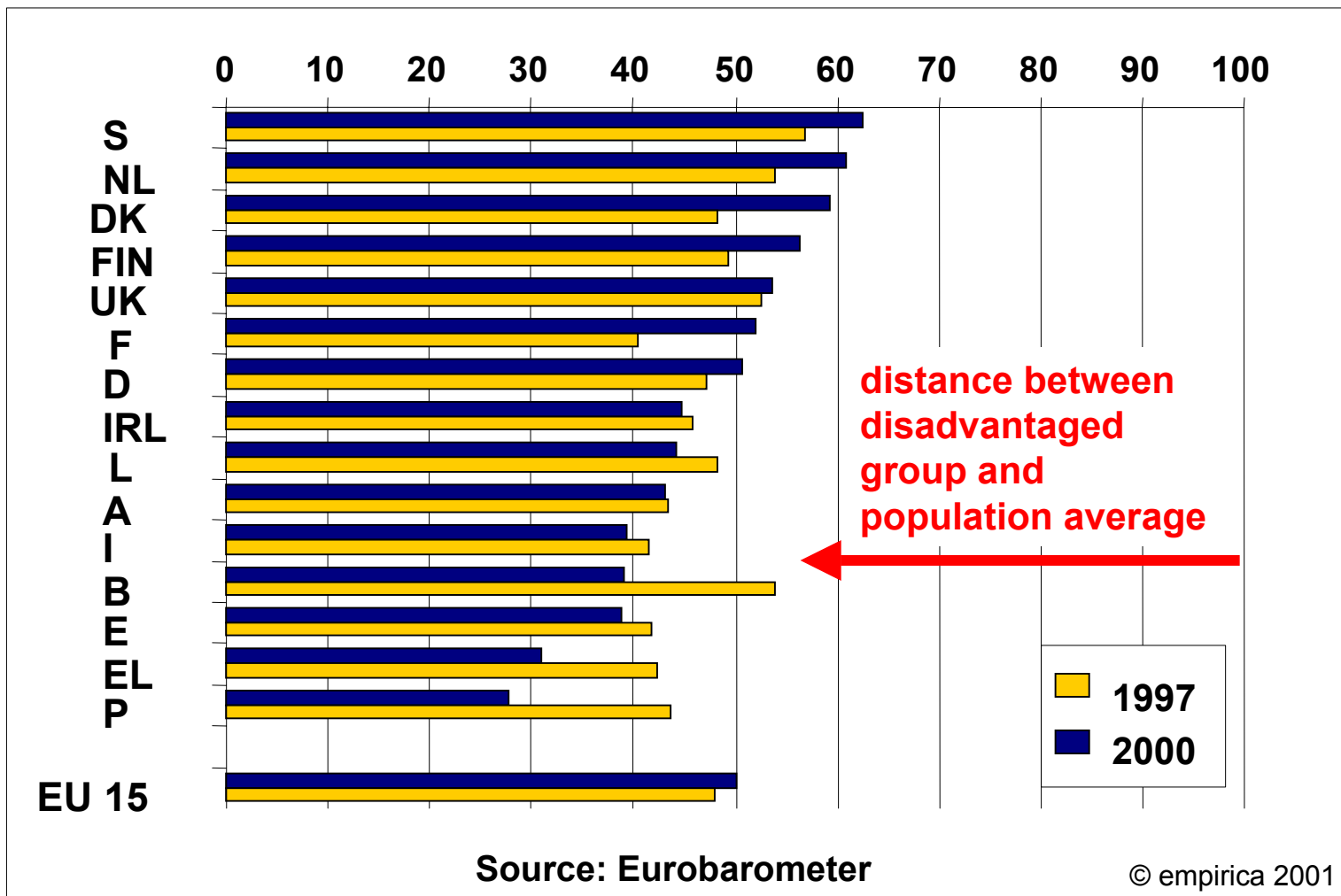
Example: Older people (50+) are only 29% as likely as the population average to use the internet at home.

The Member State Digital Divide Indices and the overall Index (2000)

○ = <70% of EU15

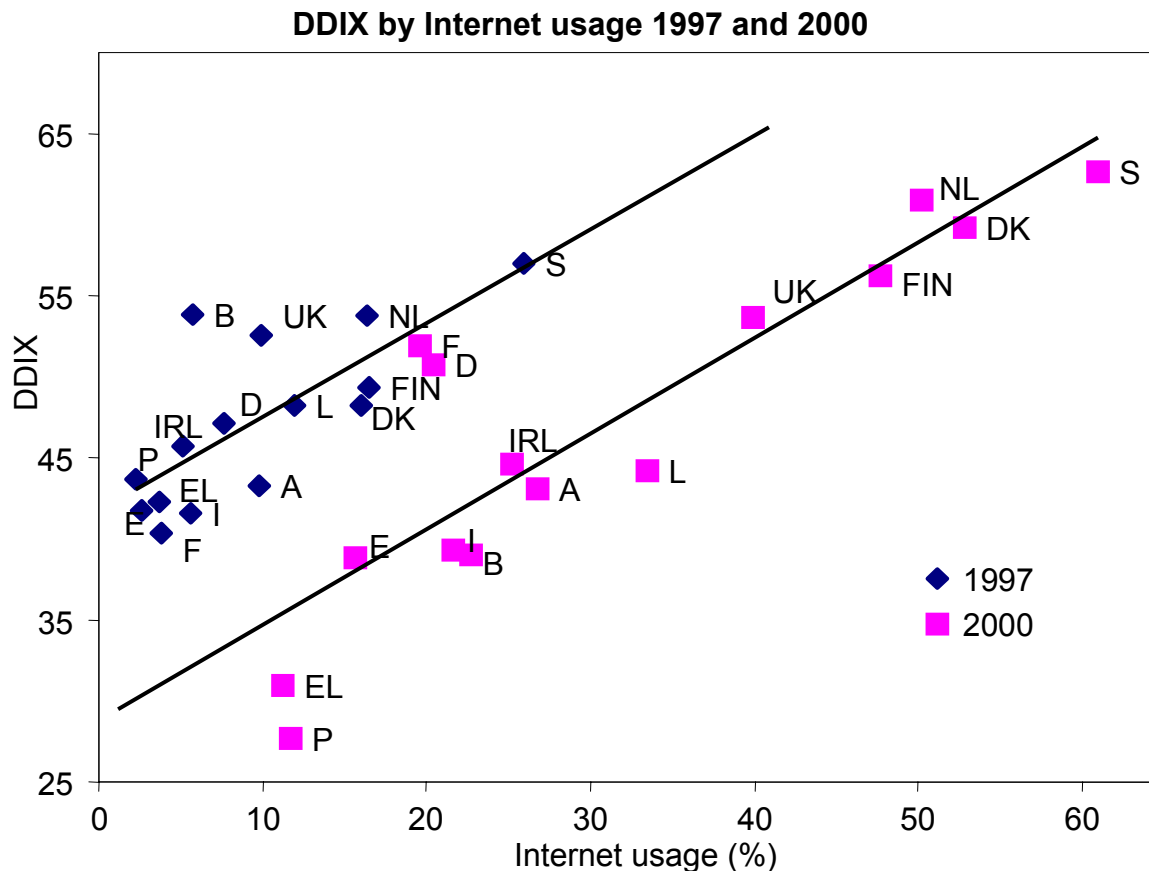
	Gender	Age	Education	Income	DIDIX
B	77	37	10	32	39
DK	84	57	35	60	59
D	80	36	34	53	51
EL	71	15	9	29	31
E	77	19	15	44	39
F	82	32	17	76	52
IRL	84	30	29	35	45
I	68	28	20	42	39
L	81	34	24	38	44
NL	81	53	32	78	61
A	73	21	28	51	43
P	68	8	7	28	28
FIN	83	52	36	54	56
S	86	60	37	67	63
UK	82	50	49	34	54
EU 15	79	39	28	54	50
MS Mean	79	36	25	48	47

The “DDIX” 1997 and 2000: Comparison of Member States



The “DDIX” 1997 and 2000: Comparison of Member States

- Stagnation on EU level effect of equality having improved in some Member States and aggravation in others:



Summary (1/4): Basic results

- Usage of computers and internet is still very uneven across different socio-demographic groups.
- The most threatened groups considerably lagging behind are:
 - People with **low education** are only **28%** as likely as the average to use a computer and the internet.
 - **Elderly** people are only **39%** as likely.
 - People with **low income** are only **54%** as likely.
- The “**gender divide**” in using computers and the internet is closing in nearly all Member States.

Summary (2/4): Basic results

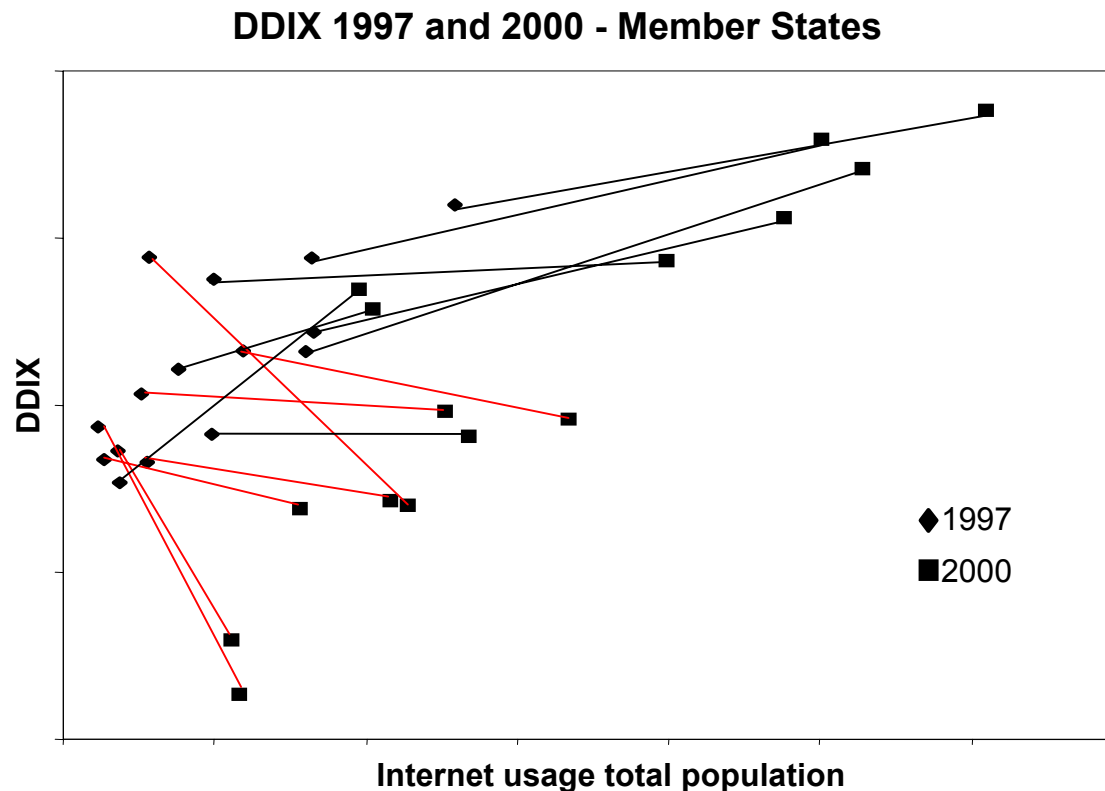
- **The Digital Divide Index** (= diffusion ratio risk group / population average) **has stagnated between 1997 (48) and 2000 (50)**.
- **But the dynamic was a different one in the four dimensions analysed in this pilot study:**

	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

Summary (3/4): Basic results

- And the dynamic was a different one in the fifteen Member States analysed in this pilot study:



Summary (4/4): Member States

- **Results suggest that the digital divide is wider in less advanced than in the leading countries (in terms of using ICT).**
 - The compound Index is **lowest in Portugal and Greece** (i.e. there are the highest relative levels of social inequality in using computers and internet).
 - The Index is **highest in Sweden, NL and Denmark.**
- **Note: The results are very different if the absolute distance (in percentage points) is measured.**
 - **But: We argue that - for most purposes - the ratio should be used as the standard measure.**

Outlook - to be discussed

- Today: **Computer skills** are a limiting factor to internet usage
 - Simpler interfaces than today's PCs?
 - Internet via TV?
 - Voice recognition software? Mobile devices?
- **More support measures** to close the digital divide?
 - If so, what type of actions?
 - Focus on whom?
- **Beyond access:**
 - Will access alone be sufficient to “participate in the information society”?
 - Is the digital divide an “access divide” or a “knowledge divide”?

Selected IST projects dealing with aspects of the digital divide

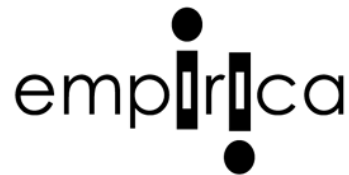


- **SIBIS (www.sibis-eu.org)**
 - Innovative statistical indicators for benchmarking the information society. One of the topics deals with “social inclusion”. 1/2001 - 6/2003
- **BISER (www.beep-eu.org)**
 - Statistical information society indicators for European regions (NUTS II). 12/2001 - 12/2003
- **SeniorWatch (www.seniorwatch.de)**
 - Study on the use of new technologies by seniors (50+) and care professionals
- **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**”. The methodology underlying the Digital Divide Index may be revised, e.g.
 - the definition of disadvantaged groups
 - selection of new indicators.
- We would appreciate your **feed-back and critical comments** - please e-mail to

tobias.huesing@empirica.com
or hannes.selhofer@empirica.com



Thank you!