

How to measure the digital divide?

KADO invites you to explore the IT World of Your
Dreams

KOREA AGENCY FOR DIGITAL OPPORTUNITY & PROMOTION

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Current Issues in the Digital Divide

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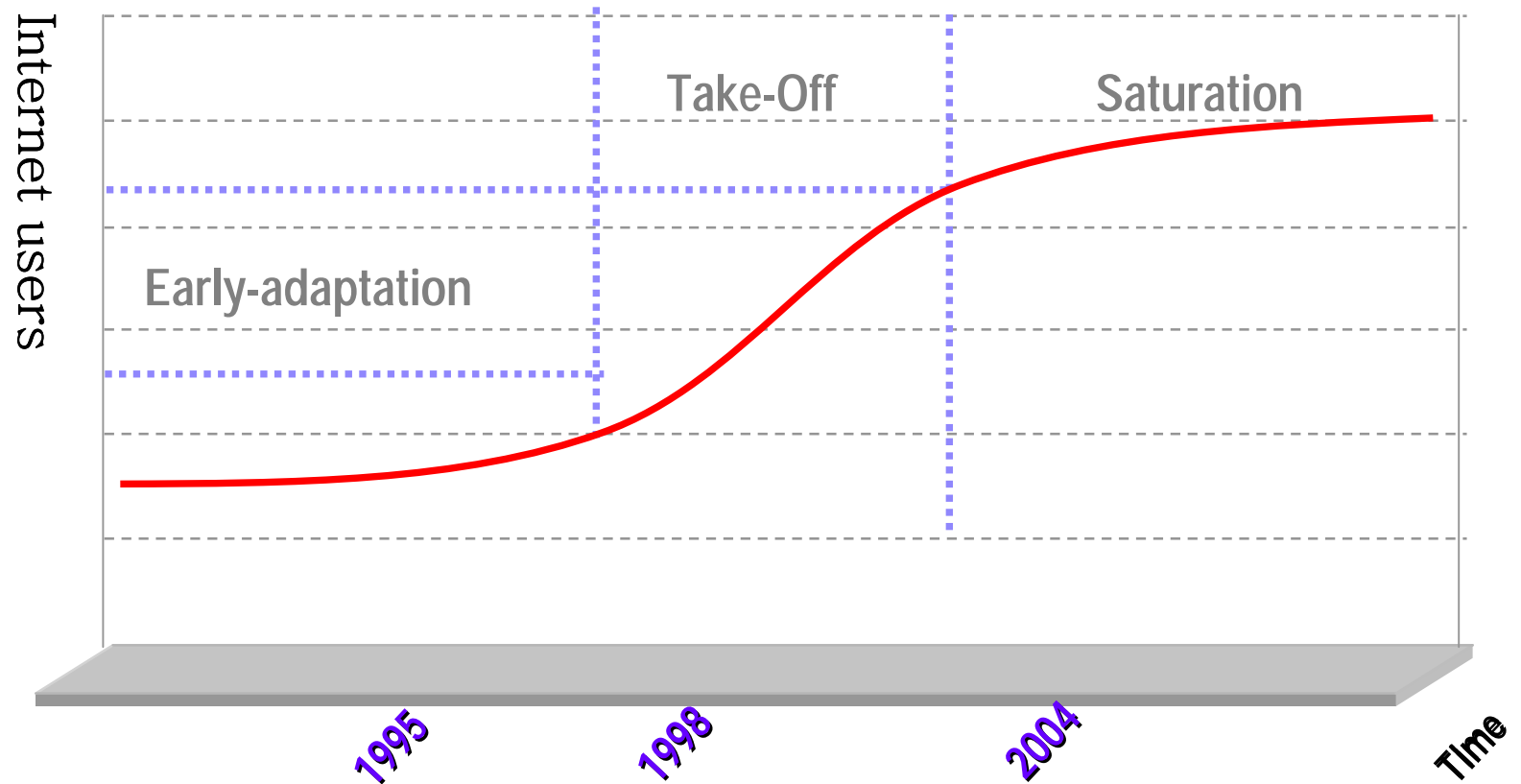
Current Issues in the Digital Divide

General Diffusion Steps of ICTs

Types	Early adoption Stage	Take off Stage	Saturation Stage
Penetration	Less adoption but rapidly increasing	Speedy adoption but not completed	Sluggish adoption but almost completed
Growth	So speedy	Sluggish growth or change in adoption speed	Stable status
Applicable Technology	Internet, PC, mobile phone	Cable, VCR	Telephone, TV

Current Issues in the Digital Divide

Internet adaptation Curve in Korea



Current Issues in the Digital Divide

Types of the Digital Divide

Stage	The Digital Divide		
	Type	Terminology	Description
Early-adoption	Access divide	Early digital divide	Description on difference between persons can access and can not
Take -off	Usage Divide	Primary digital divide	Description on difference between users and not users
Saturation	Divide stemming from the Quality of Use	Secondary digital divide	Description on difference within users

Definition of the Digital Divide

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Definition of the Digital Divide

General Definition

• OECD's definition

Gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access ICTs and to their use of the Internet for a wide variety of activities

• Academic definition

- The term *digital divide* refers to the disparity in accessing to the technologies and resources of the information and communication. The digitalization of the economy and the society may produce differences and gaps amongst individuals, households, businesses, and geographic areas, rich and poor countries.
- Measuring the digital divide involves a lot of criteria concerning: network access, human capabilities, knowledge and application, IT expertise, IT usage in business sector. Also the way in which the technological disparity is reckoned can vary in different perspectives, all having a reasonable fundament.

Definition of the Digital Divide

General Definition

- The Basic Digital Divide

difference between users and non users in access, ability, and usage

- The Dual Digital Divide

between users and non users but has more than one obstacles
i.e : disabled living in rural, or elderly women

- The Second Digital Divide

- Difference within user groups
- Difference between productive users & consuming users
- Difference between power users & passive users

❑ Two kinds of the Digital Divide

- ✓ Vertical Divide: Gap between IT users and non-users
 - Problem of equal opportunity (First level divide)
- ✓ Horizontal Divide: Gap among IT users
 - Problem of social integration (Second level divide)

❑ Currently, vertical divide is the hot issue

Operational Definition of the Digital Divide

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Operational Definition of the Digital Divide

What is an appropriate Operation Definitions

Operational Definitions Usually by UK, USA, Japan, etc.

- Divide in Internet usage of individual at home
- Divide in Internet usage of individual at any places
- Divide in home PC ownership
- Divide in PC accessibility of individual
- Divide in Internet subscription of household
- Divide in broadband internet subscription

Drawbacks in the Operational Definition of the Digital Divide

- **Mainly Focusing Access**

Internet usage, Home PC ownership, Internet subscription

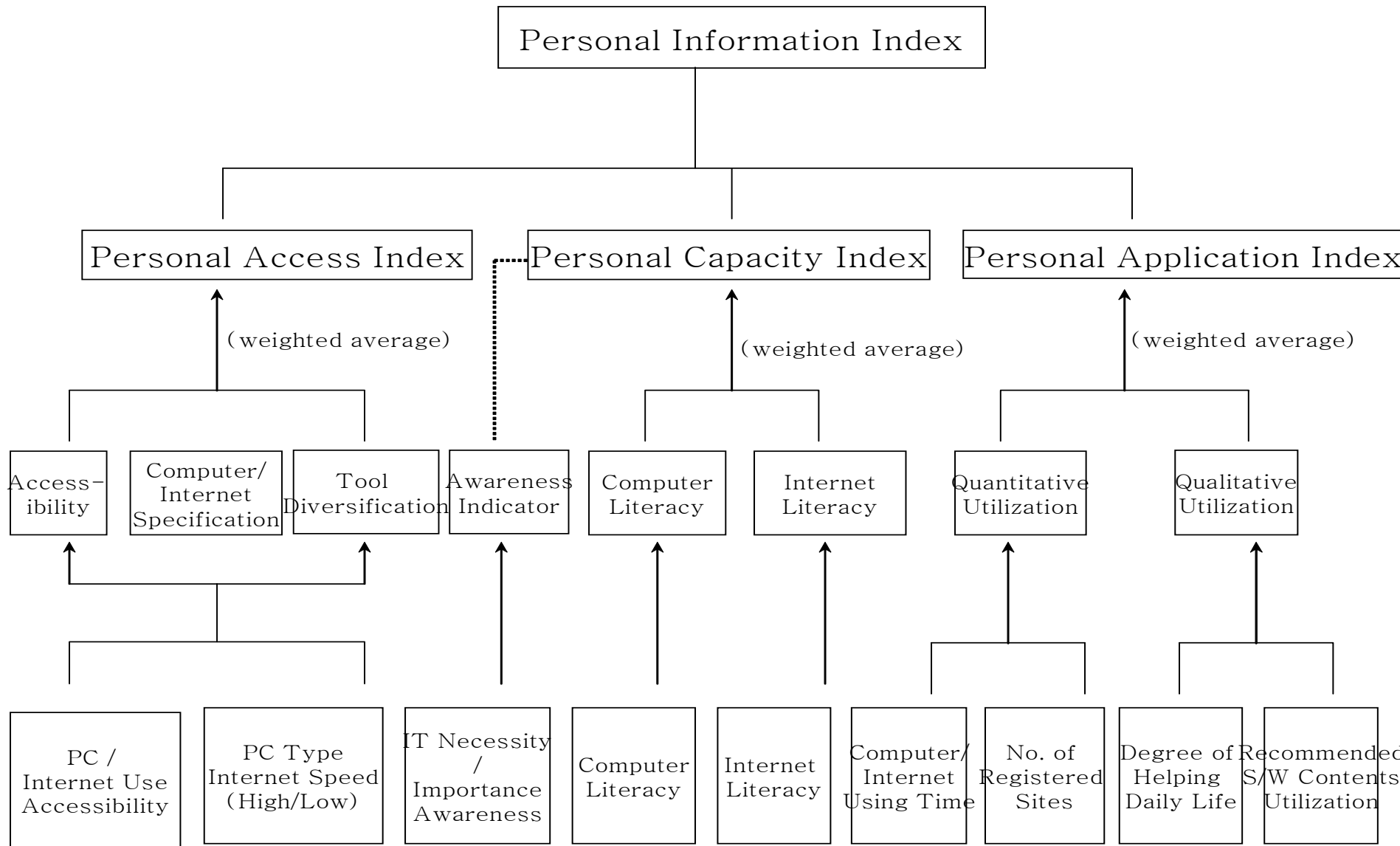
- **Do not Cover Usage and Application Divide**

Ability to use Internet, or Computer, Usage or Application of Computer/Internet

- **Need to Develop Composite Measure**

Composite Index including access, ability, and utilization / application

Example of Composite Index



Source : KADO

Measurements of the Digital Divide

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Measuring of the Digital Divide(Cross Sectional)

- Comparison informatization level between advanced and disadvantaged groups across gender, age, income, region, education etc.

age	2001
3-8	27.9
9-17	68.6
18-24	65.0
25-49	63.9
More 50s	37.1

31.% p
difference

Incomes	2001
Less \$15,000	25.0
\$15,000-\$24,999	33.4
\$25,000-\$34,999	44.1
\$35,000-\$49,999	57.1
\$50,000-\$74,999	67.3
More \$75,000	78.9

53.9% p
difference

Source : A Nation online(USA, 2002)

- Drawback : Just difference between two extreme groups but not overall score(picture) of the digital divide across categories
Not taking into account intermediate groups,

Measuring of the Digital Divide(Cross Sectional)

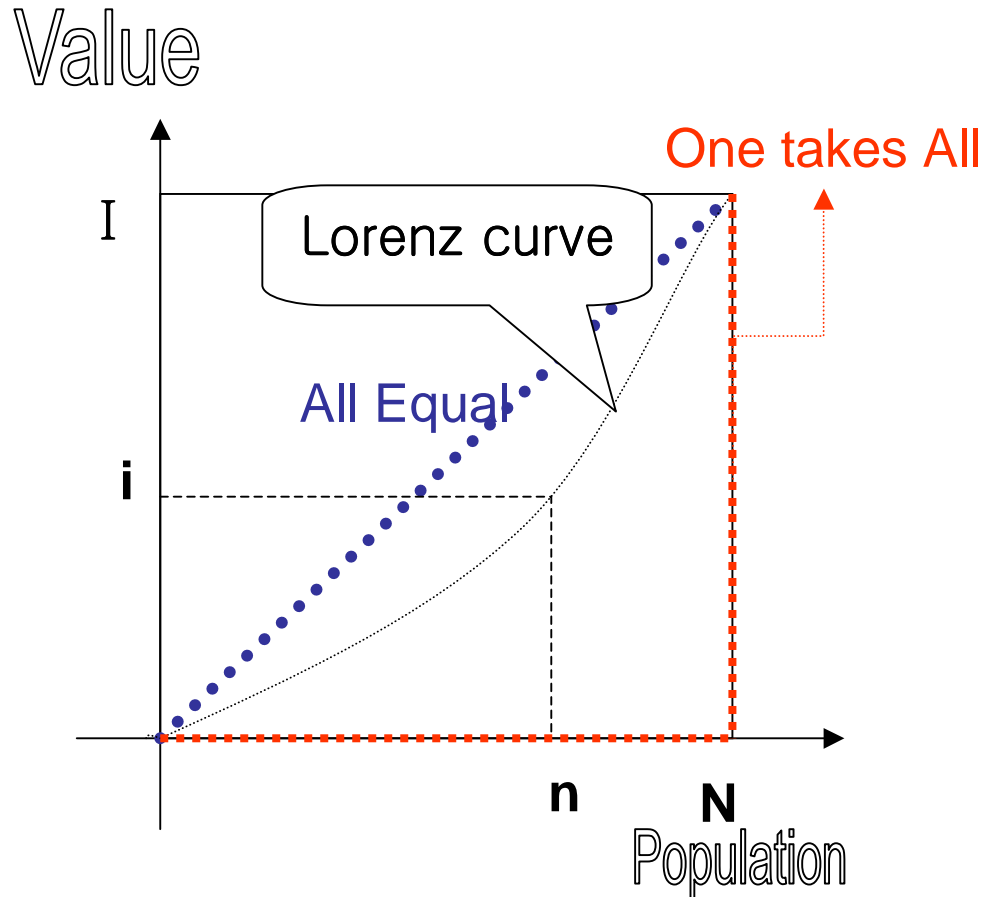
- Each data use different categories, especially income, social status

variables	USA	UK
Ages	Less \$15,000	Less 17,500 <i>L</i>
Incomes	\$15,000-\$24,999	
	\$25,000-\$34,999	17,500 <i>L</i> -30,000 <i>L</i>
Residential	
Social status	More \$75,000	More 30,000 <i>L</i>
.....		

- Drawback : lack of standard in measuring the digital divide,
Thus, hard to compare across nations

Measuring of the Digital Divide(Cross Sectional)

□ Lorenz curve

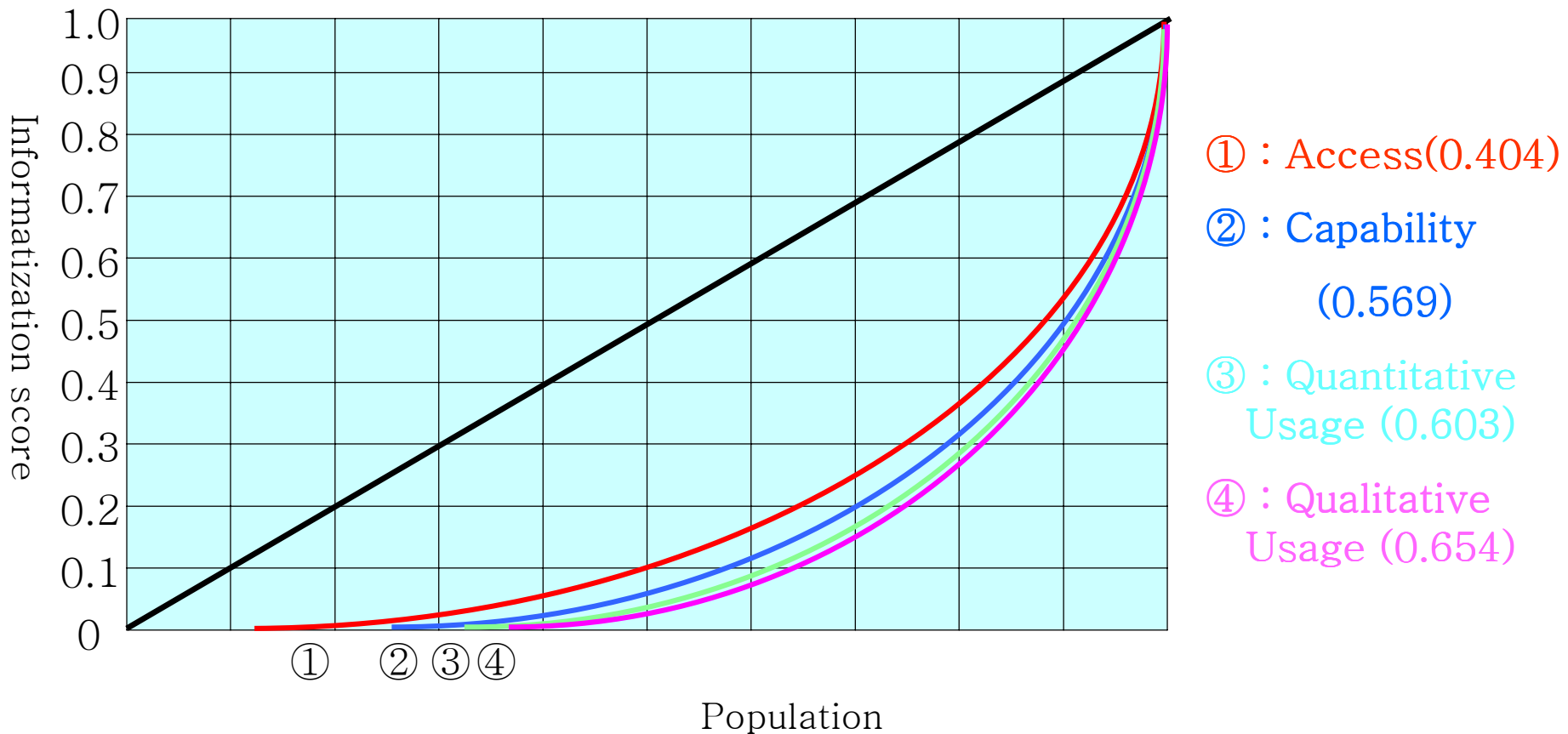


□ Gini coefficient

Measurement the area between the diagonal and the Lorenz curve(0, absolute equality, 1, absolute inequality)

Measuring of the Digital Divide(Cross Sectional)

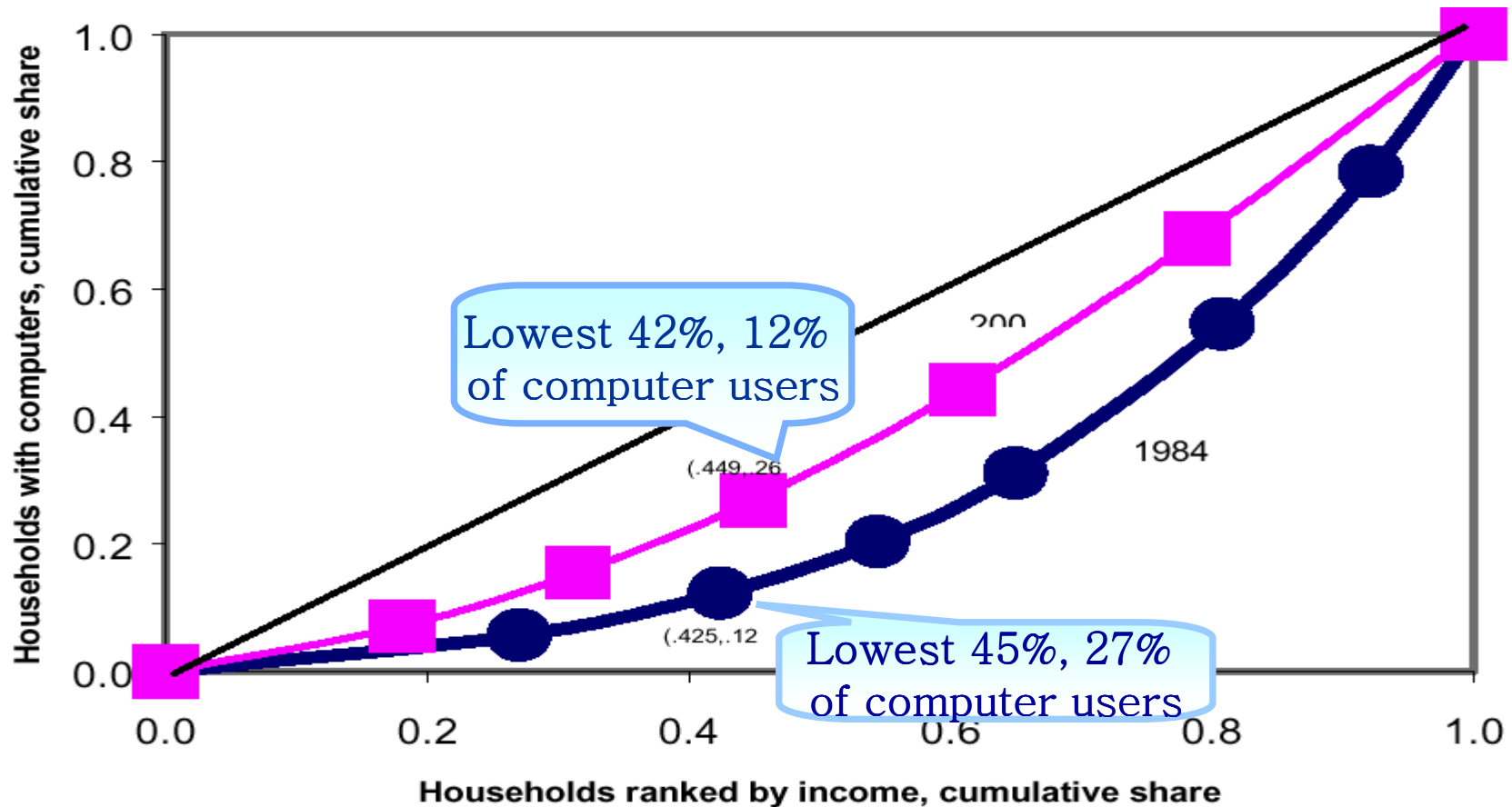
- Lorenz Curve for the digital divide for all population



Source : KADO(Pilot study), 2003

Measuring of the Digital Divide(Cross Sectional)

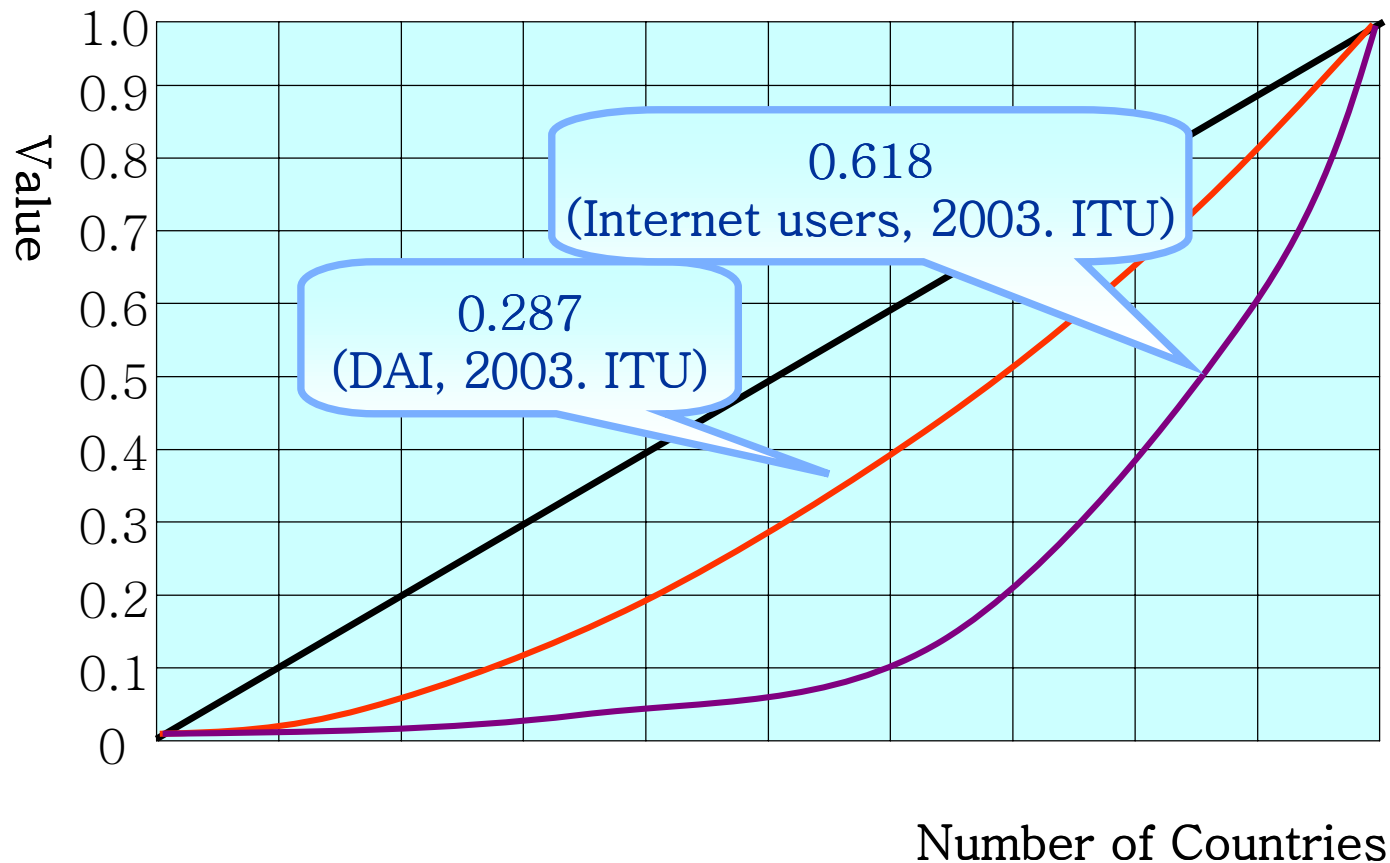
- Lorenz Curve for Households with Computers vs. Income



Source : A Nation online(USA, 2002)

Measuring of the Digital Divide(Cross Sectional)

- Lorenz Curve for Global Digital Divide



Source : ITU Data

Measuring of the Digital Divide(Time Series)

- What have to be considered in tracking trends

A : Track the score difference between extreme groups

B : Track the ratio of penetration rates bet extreme groups

C : Track the increase rate of particular group

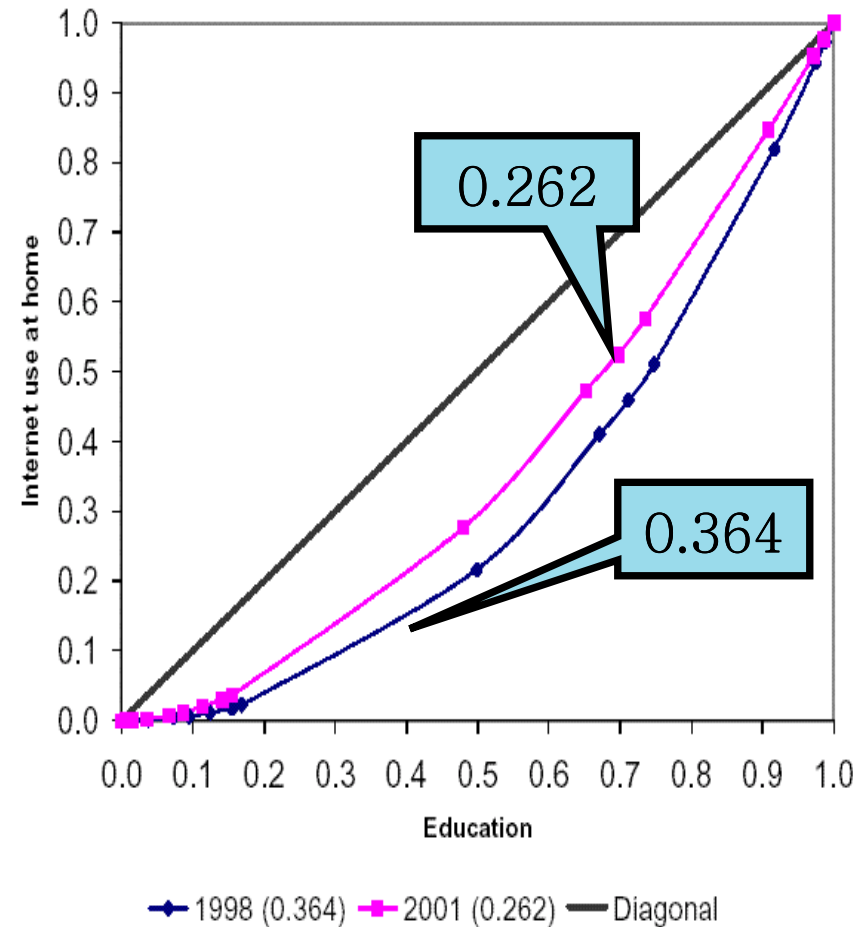
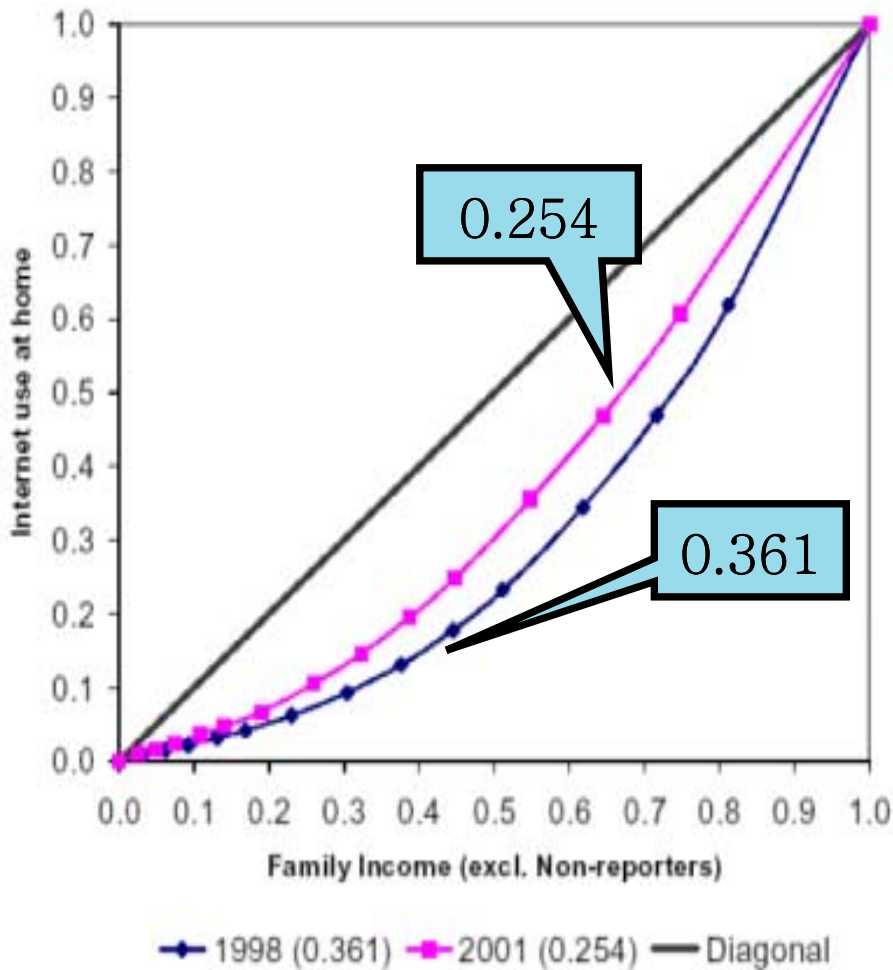
D : Track the Gini coefficients

variables
Incomes
Ages
Residential
Social status

Category	2000	2001	2002	2003	2004 June	Increase rate
7-19	65.9	93.3	90.6	91.3	95.5	145 %
20s	65.9	84.6	86.0	94.3	95.0	144 %
30s	35.4	61.6	66.7	78.5	86.4	244 %
40s	18.5	35.6	38.9	50.8	58.3	315 %
50s	7.1	14.9	17.5	23.2	27.6	389 %
More 60s	1.8	3.4	3.2	5.1	7.3	406 %
Difference score	64.1 P	89.9 P	87.4 P	89.2 P	88.2 P	
Ratio (times)	36.6	27.4	28.3	18.5	13.1	

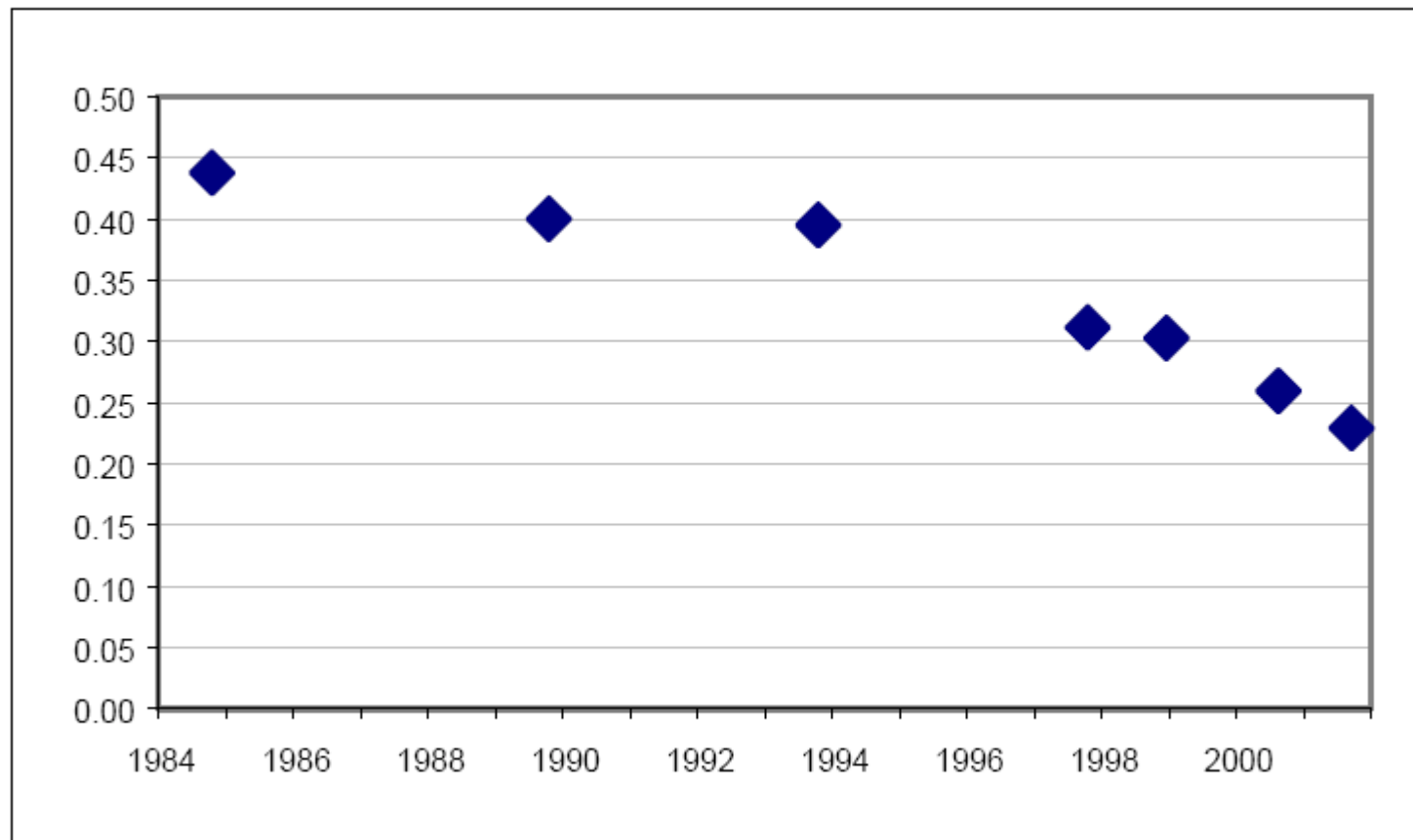
Source : KRNIC, 2004

Measuring of the Digital Divide(Time Series)



Source : A Nation online(USA, 2002)

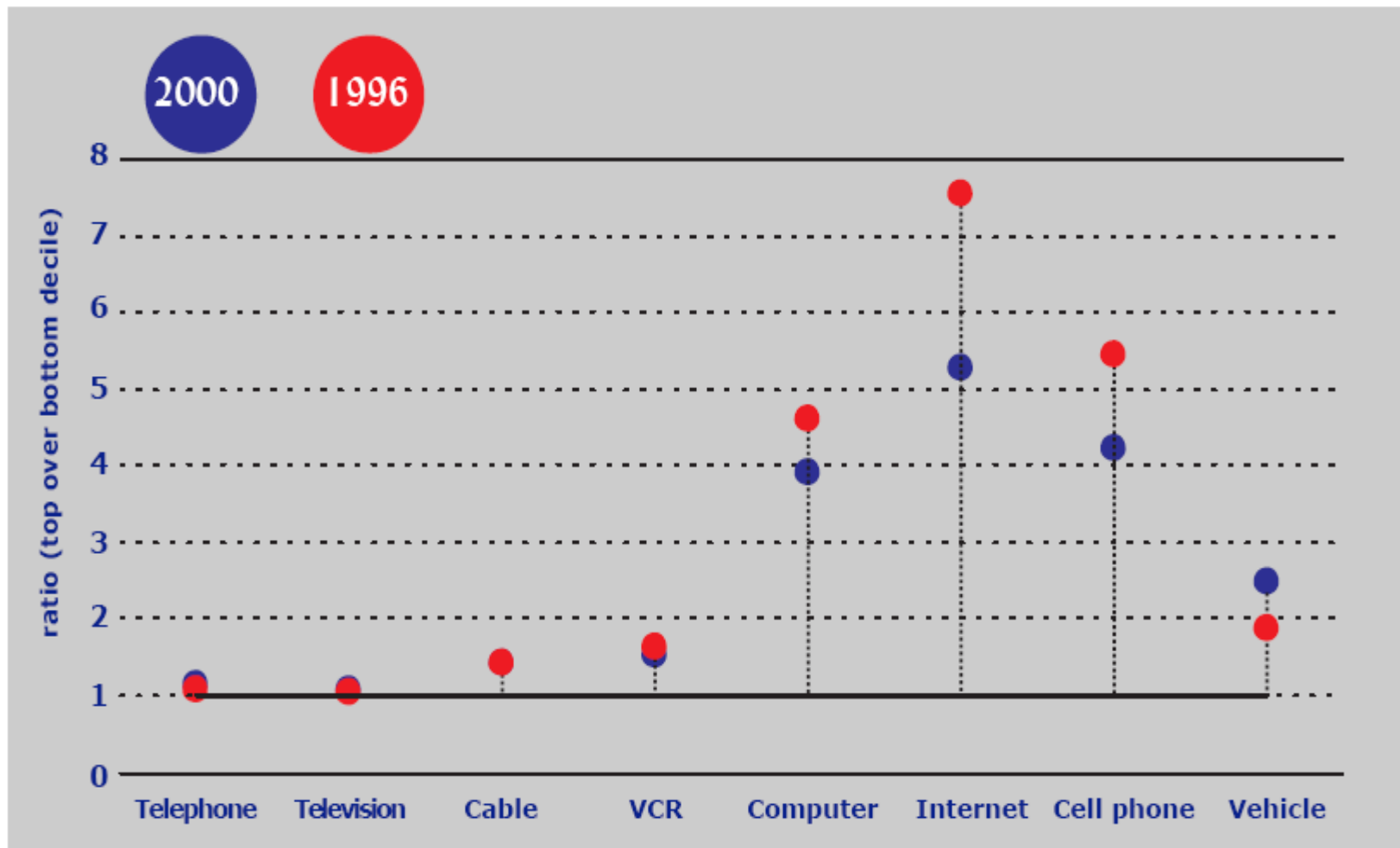
Gini Coefficients for Households with Computers, Selected years



Source : A Nation online(USA, 2002)

Measuring of the Digital Divide(Time Series)

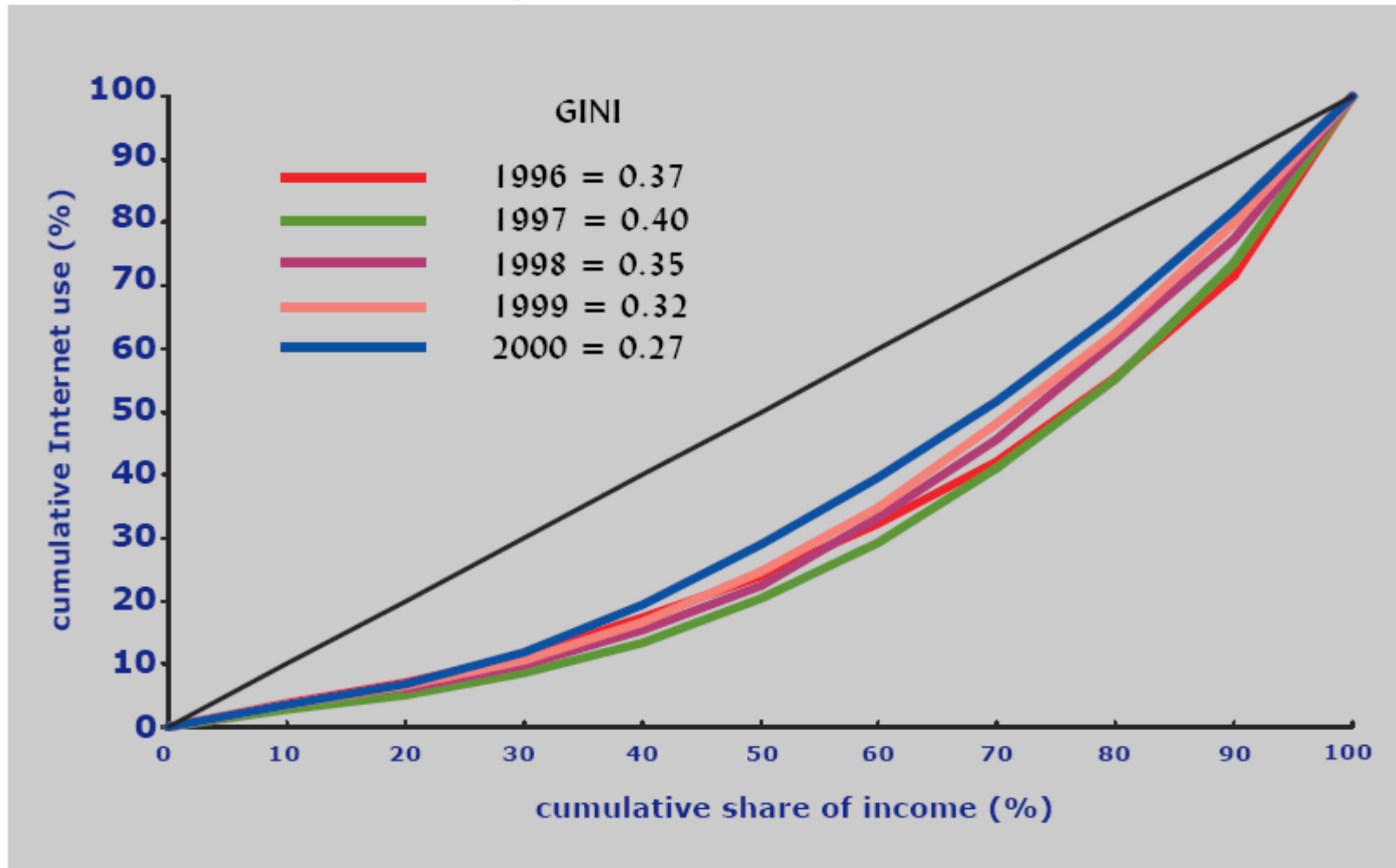
Ratios of penetration rates, top vs. bottom income deciles



Source : The Digital Divide in Canada(George Sciadas)

Measuring of the Digital Divide(Time Series)

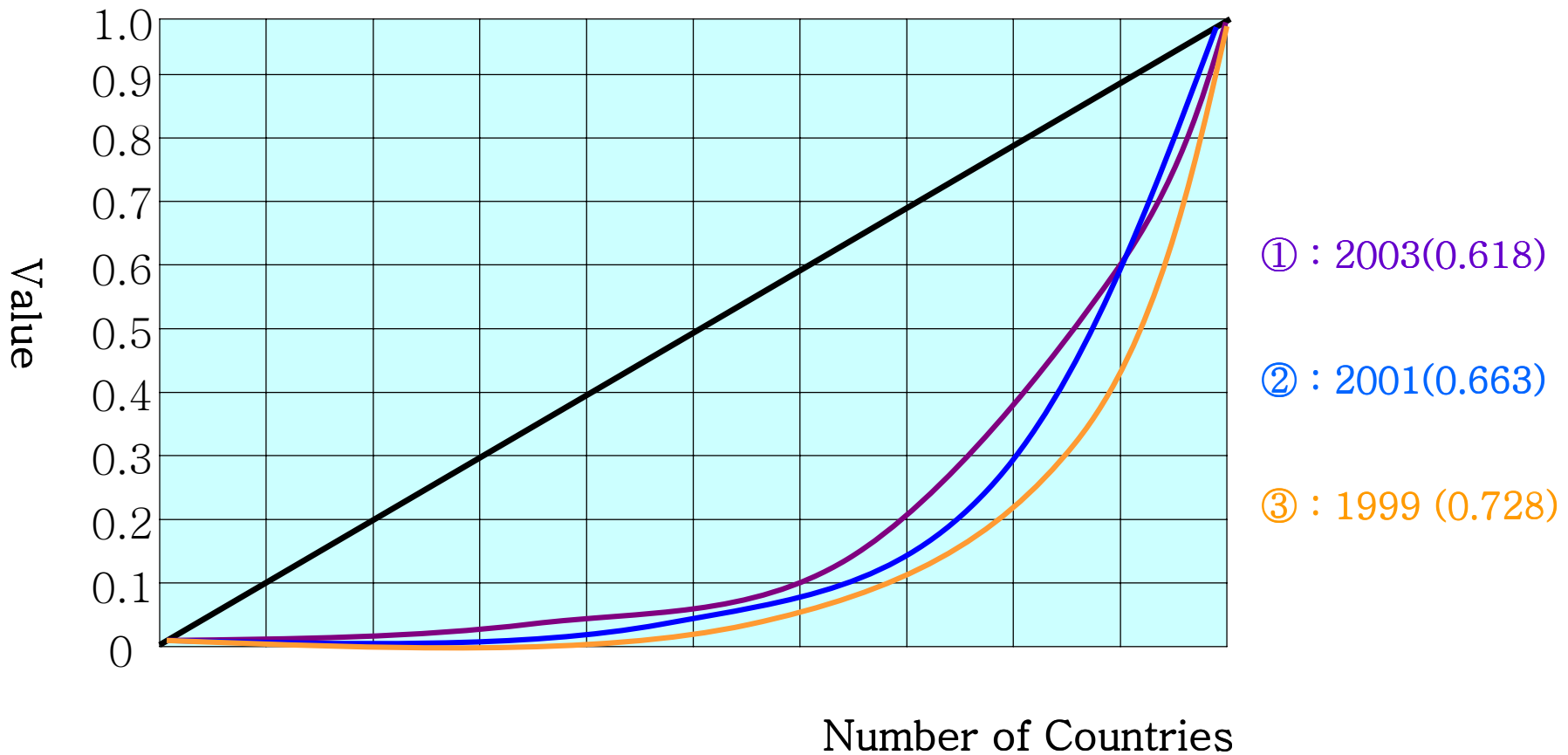
Evolution of the relative Internet divide, home use.



Source : The Digital Divide in Canada(George Sciadas)

Measuring of the Digital Divide(Times Series)

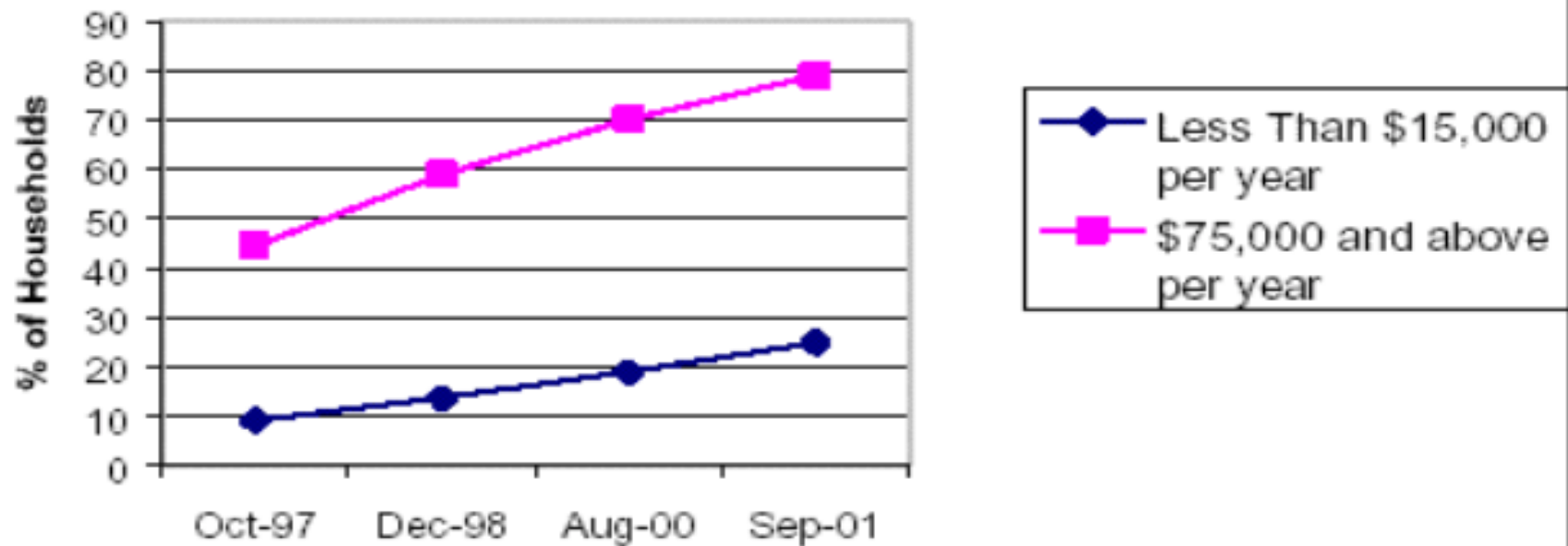
- Gini Coefficients for Internet User Rate (Worldwide)



Source : KADO using the ITU Data

Measuring of the Digital Divide(Time Series)

Internet Access (by Income)



Source : Benton Foundation(2002)

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Conclusion



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❑ Not just access, include ability and application(second digital divide)

- ✓ Development of composite measure including ability and application such as Personal Informatization Score

❑ Necessity of Standardized tool to measure the digital divide

- ✓ Different conclusion by the different measurements
- ✓ Merits or Limitations of each measurement
- ✓ Merits or limitation of Lorenz curve in measuring the digital divide
- ✓ Clear understanding of the meaning of Lorenz curve

Thank you

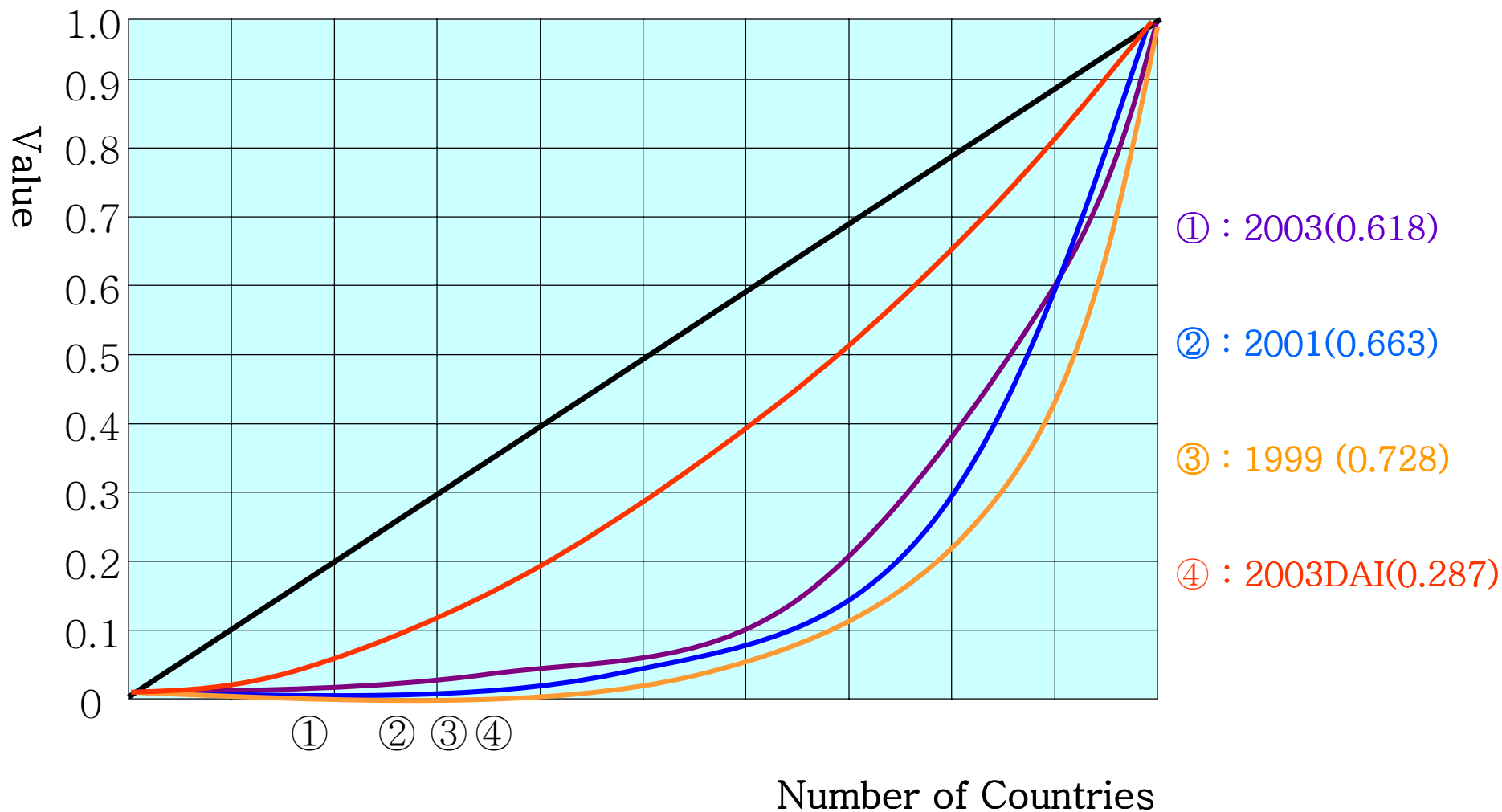
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Global Digital Divide (GINI Coefficient Curve)



Source : KADO. Jin