

Development of DOI-based Policy

KOREA AGENCY FOR DIGITAL OPPORTUNITY & PROMOTION



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I. Process of Policy Development

II. Understanding the Meaning of DOI Score

III. Classification of Countries by DOI Score

IV. Open discussion

Process of Policy Development

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Process of Policy Development

● 1st Stage

- Understanding the meaning of DOI score

● 2nd Stage

- Classification of countries by DOI score

● 3rd Stage

- Classified group-based policy suggestions

● 4th Stage

- Collection and distribution of best cases

Understanding the Meaning of DOI score

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● **Items to be analyzed**

- **Pattern of distribution**
- **Range(Minimum and Maximum)**
- **Average score**
- **Gini coefficient**

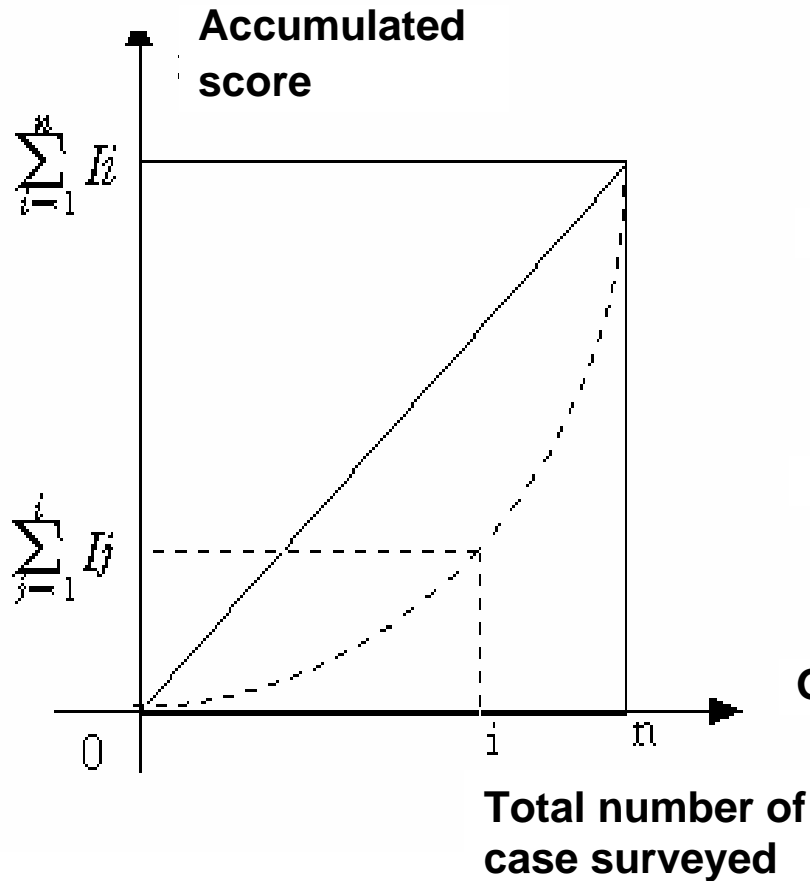
The Concept of Gini Coefficient


Understanding Gini Coefficient

- **Gini coefficient, which is used in economics as the summary measurement of unequal income distribution, can be used for calculating the magnitude of inequality of DOI score**
- **The Gini Coefficient is located from 0 to 1. The Gini Coefficient is '0' in an absolute equal distribution, and '1' in an absolutely unequal distribution.**
- **In general, a distribution is regarded unequal when the Gini ratio becomes larger than 0.3. It is regarded quite unequal when the Gini ratio is larger than 0.4.**

The method of calculating Gini Coefficient

The method of calculating Gini Coefficient



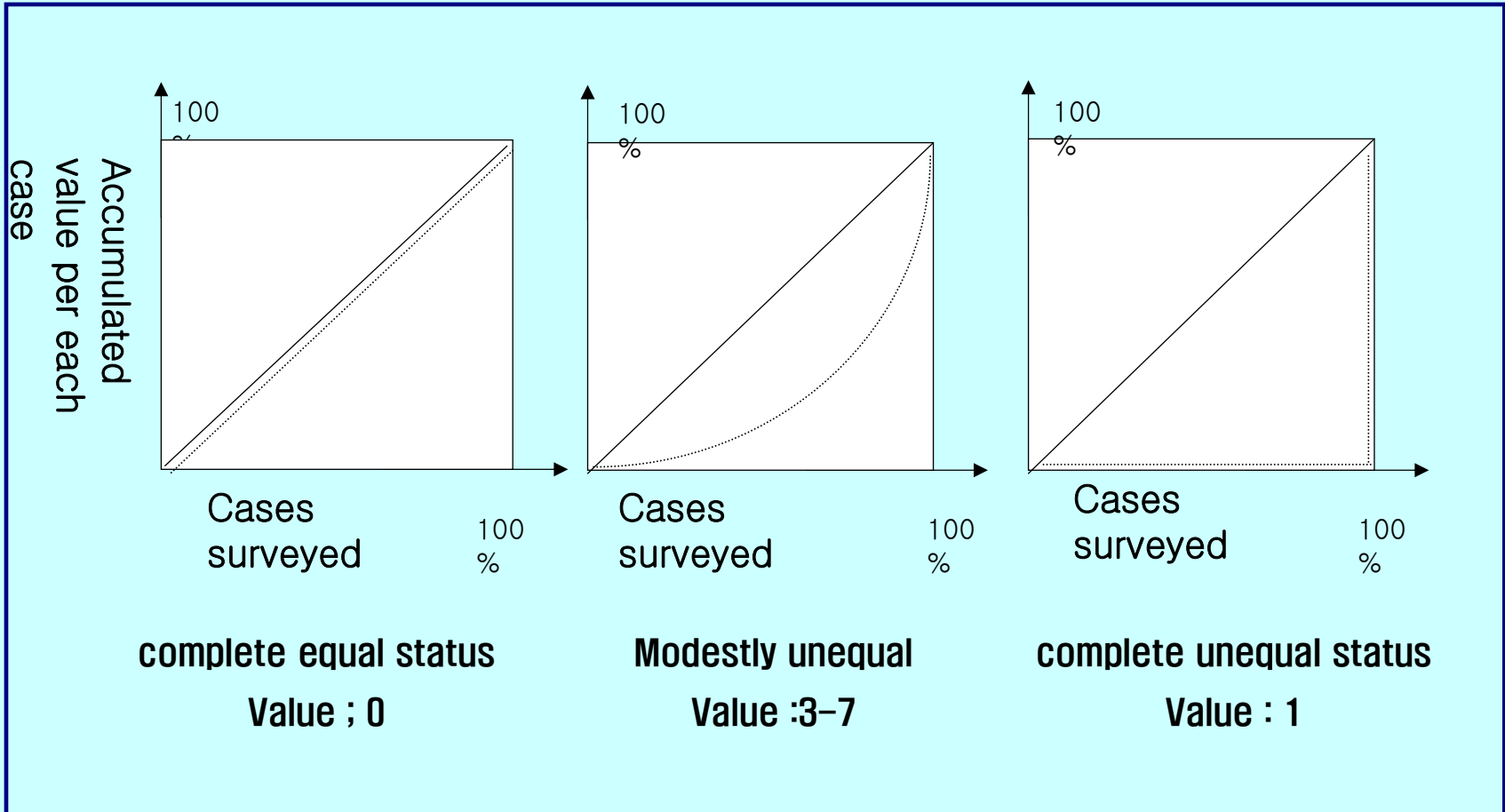
Area (a)  : $\frac{\sum_{i=1}^n I_i}{2} * n$ --- ③

Area (b)  : $\sum_{i=1}^n \sum_{j=1}^i I_j$ --- ⑤

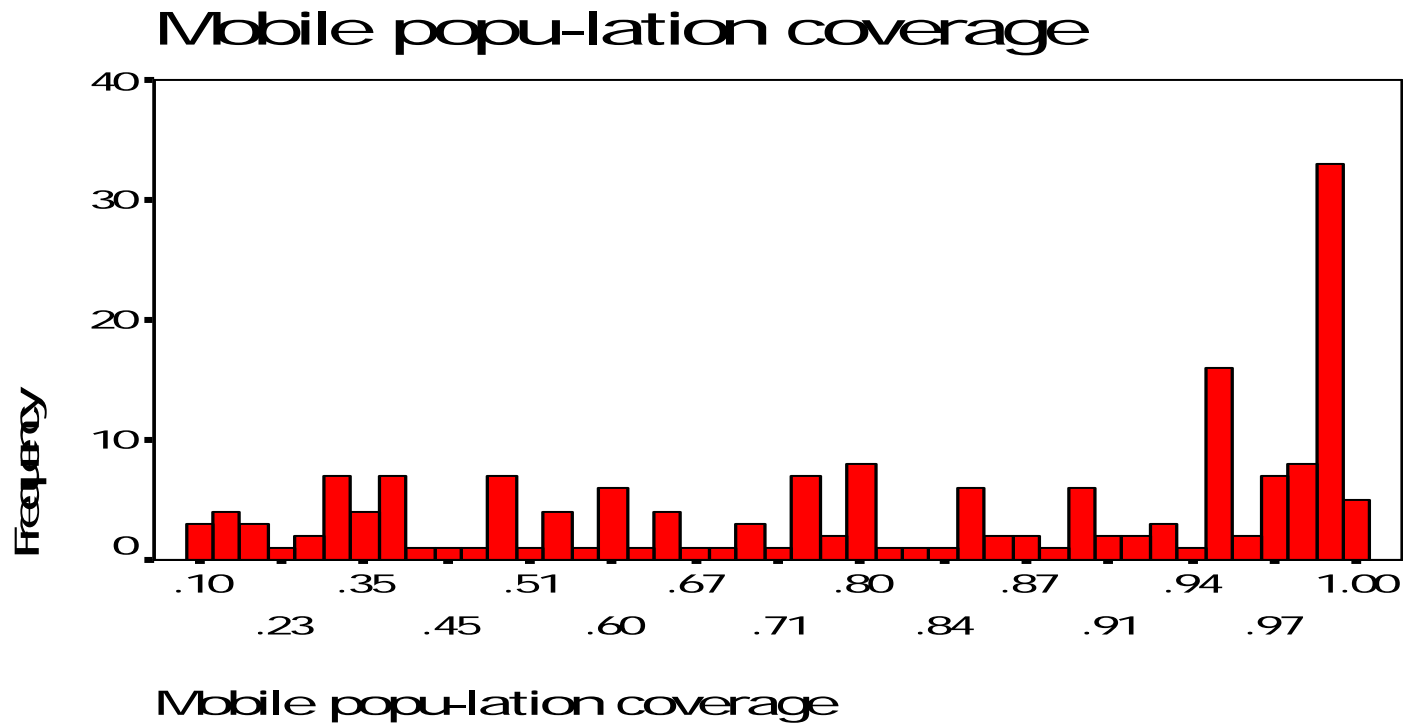
Gini Coefficient $\frac{\text{③} - \text{⑤}}{\text{③}}$

The Concept of Gini Coefficient

< Interpretation of Gini Coefficient >



Mobile Coverage



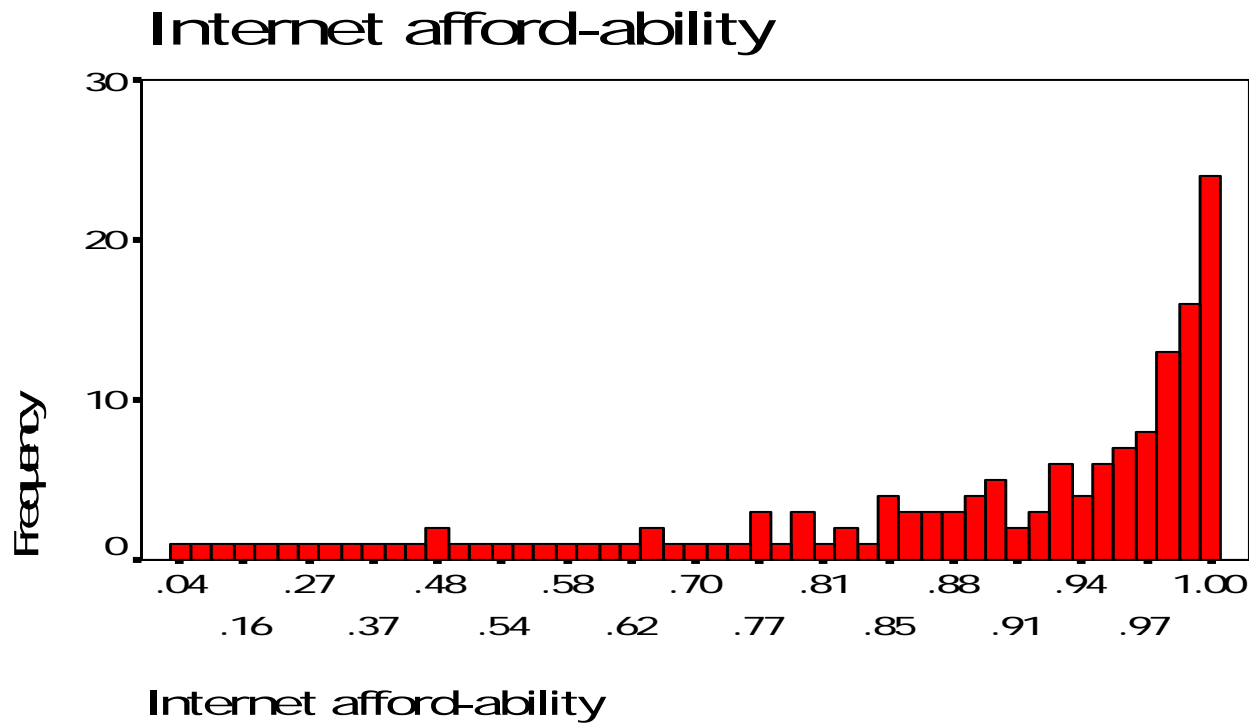
Widely distributed from 10% to 100% but more countries on high coverage

Countries with more than 90% coverage : 50%

Countries with less than 50% coverage : 23%

Average score: .75 : Gini Coefficient : 0.18

Internet Affordability

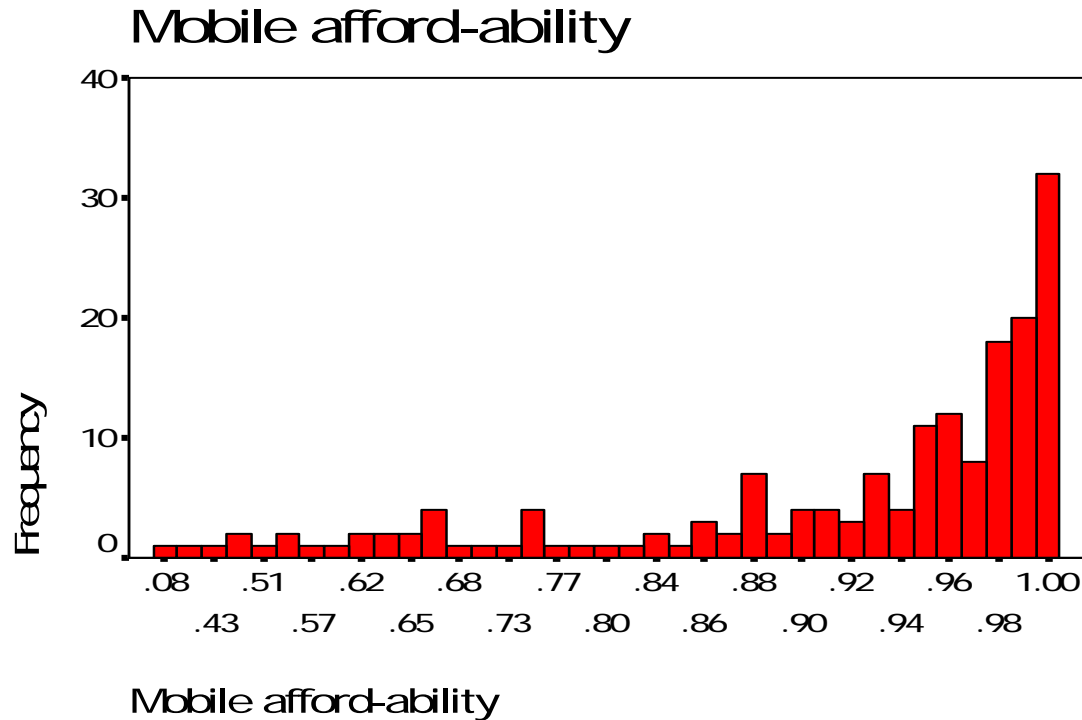


Majority(60%) pay less than 10% of monthly income for Internet access

But 10% pay more than half of monthly income for Internet access

Average score: .85 ; Gini Coefficient : 0. 26;

Mobile Affordability

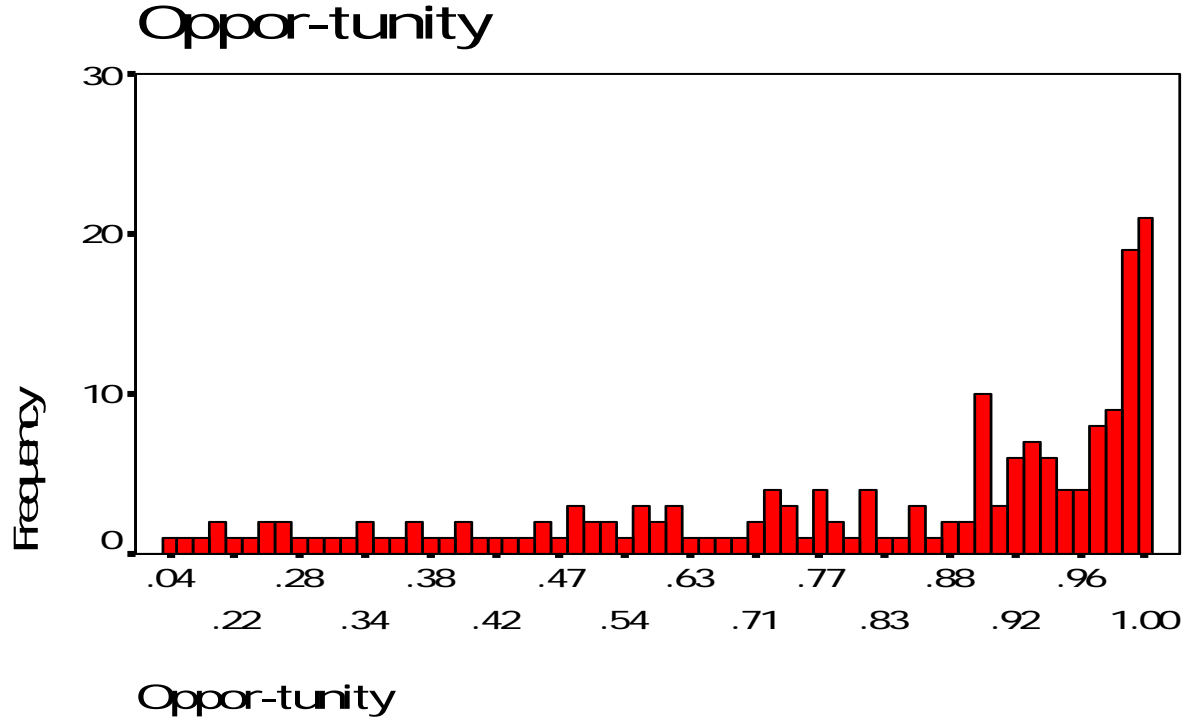


Majority(70%) pay less than 10% of monthly income for the mobile access

Only five countries pay more than half of monthly income for the mobile access

Average score:.90

Gini Coefficient : 0. 12 (lower than Internet affordability)



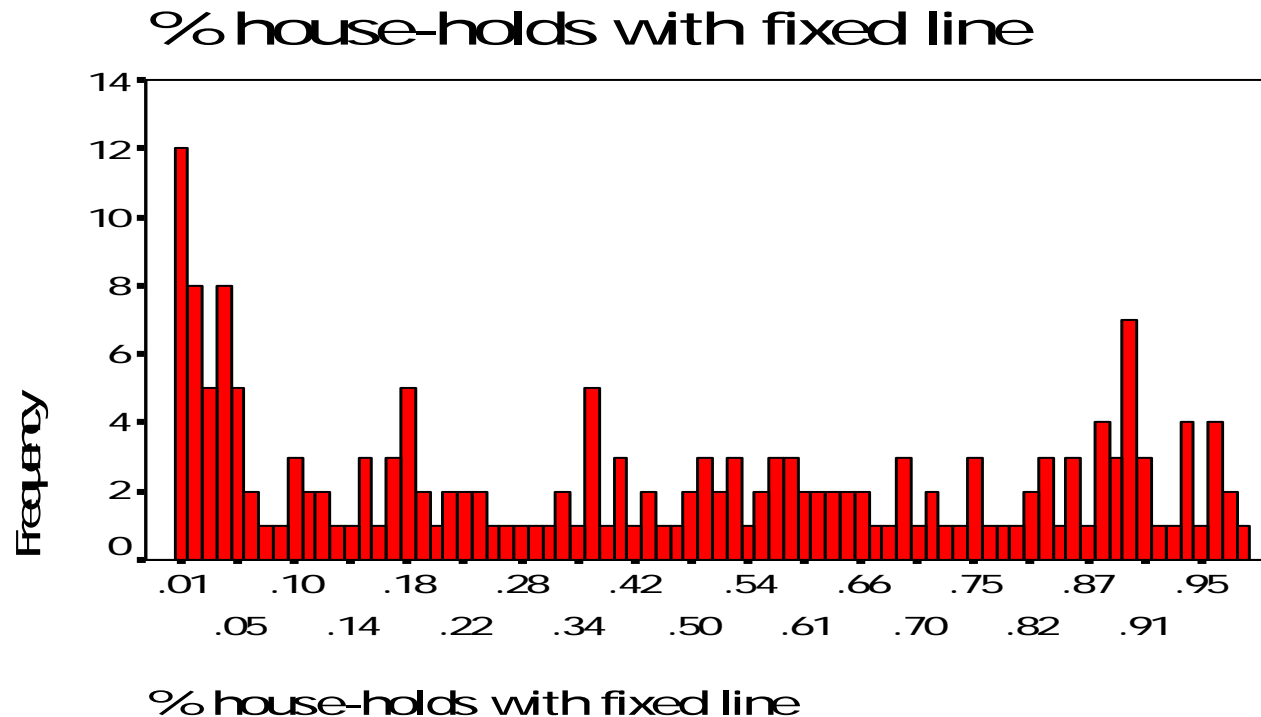
Majority of countries scored a high value in Opportunity

Around 50% of countries scored more than .90 point

Average score: .77

Gini Coefficient : 0.17

Household with fixed line

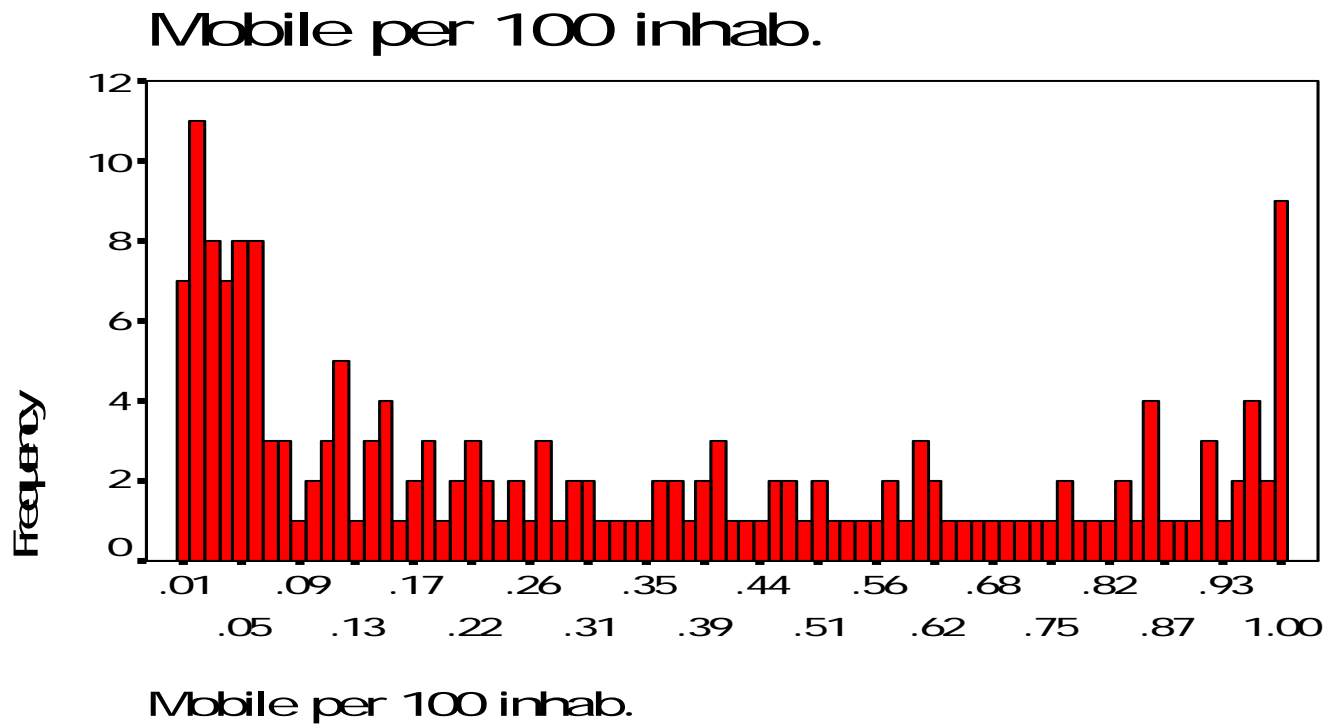


Half is less than 50% and another half is more than 50%

Lowest 25% have less than 10% of fixed line connected household while highest 25% have more than 80% of fixed line connected household

Average score 0.44 ; Gini Coefficient : 0. 43;

Mobile Subscribers



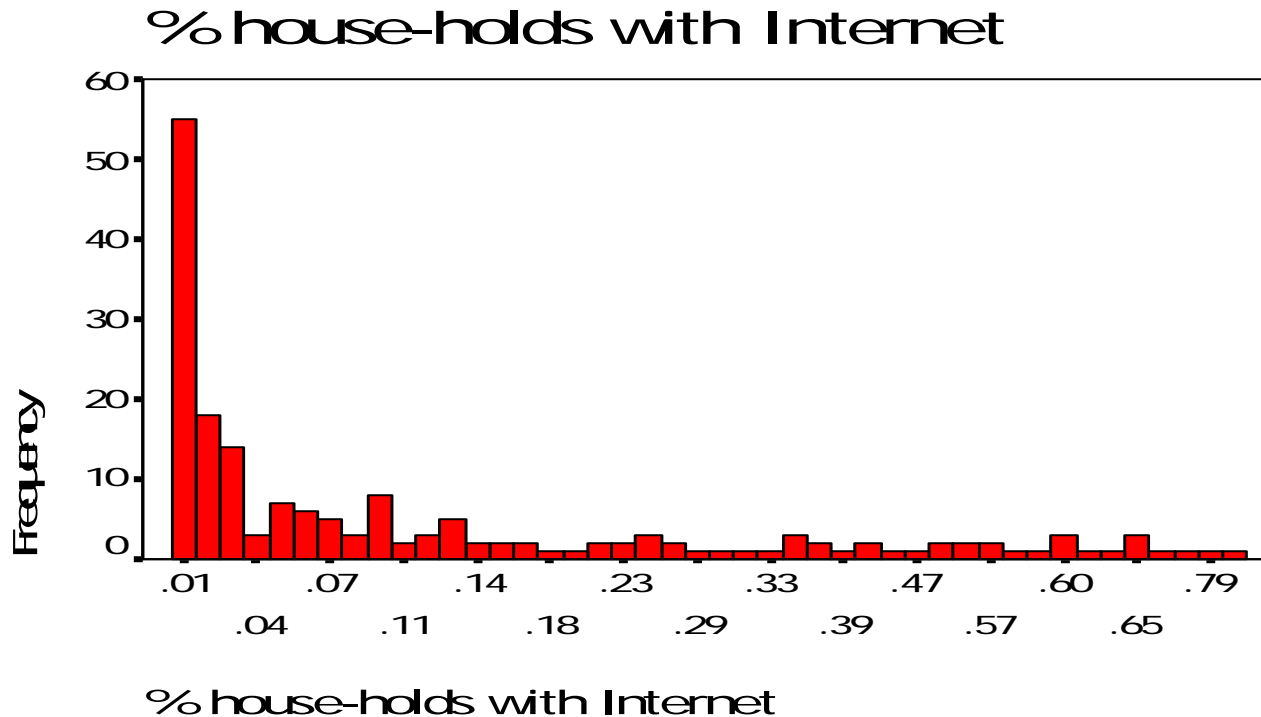
Similar pattern to fixed line connection but more unequally distributed

Lowest 25% have only less than 5% of mobile users

Average score: .37 which is lower than fixed line connected household despite rapid growth of mobile subscribers mobile users

Gini Coefficient : 0.51

Internet Connected Household



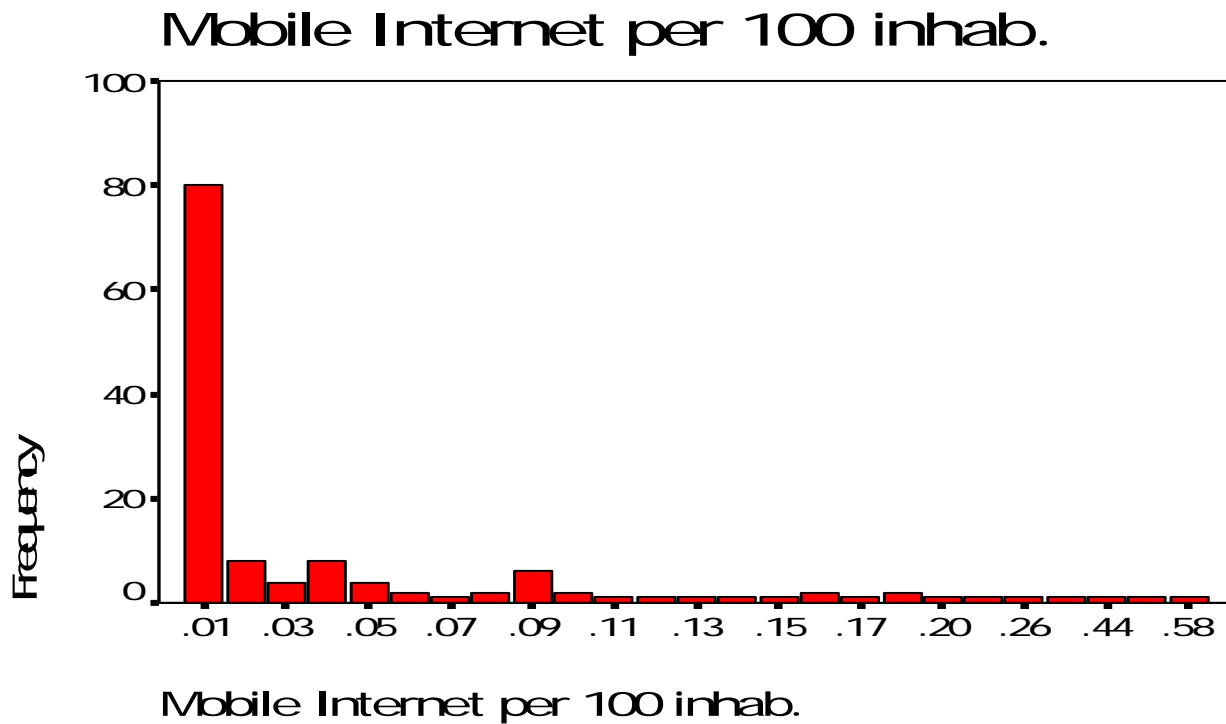
Internet connected household is rare in the majority of countries

It is lower than 10% in the 60% of countries

Only top 10% have more than 50% of Internet connected household

Average score:.14 Gini Coefficient : 0.67;

Mobile Internet Users



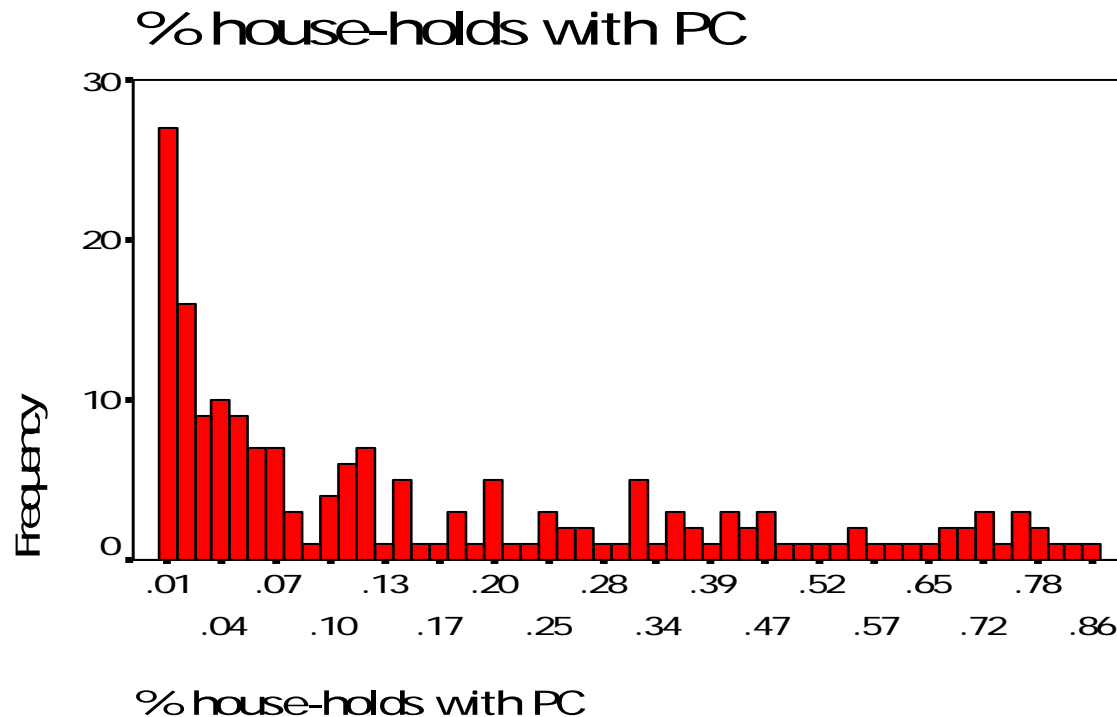
Mobile Internet users are much rare than Internet connected household

It is lower than 1% in the more than 50% of countries

More than 15% of mobile internet is found only in 10% of countries

Average score: .05 Gini Coefficient : 0.84;

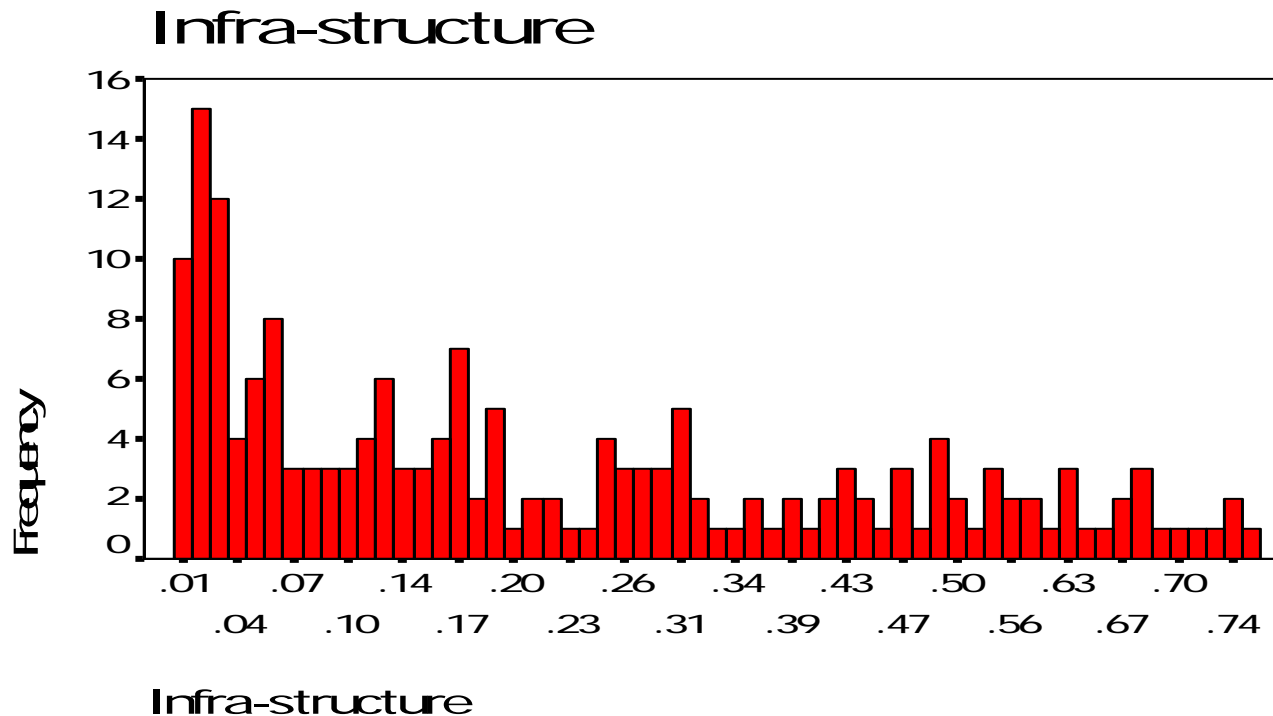
Household with PC



it is lower than 10% in the half of countries

However average score(.20) is slightly bigger than household with Internet(average :.14)

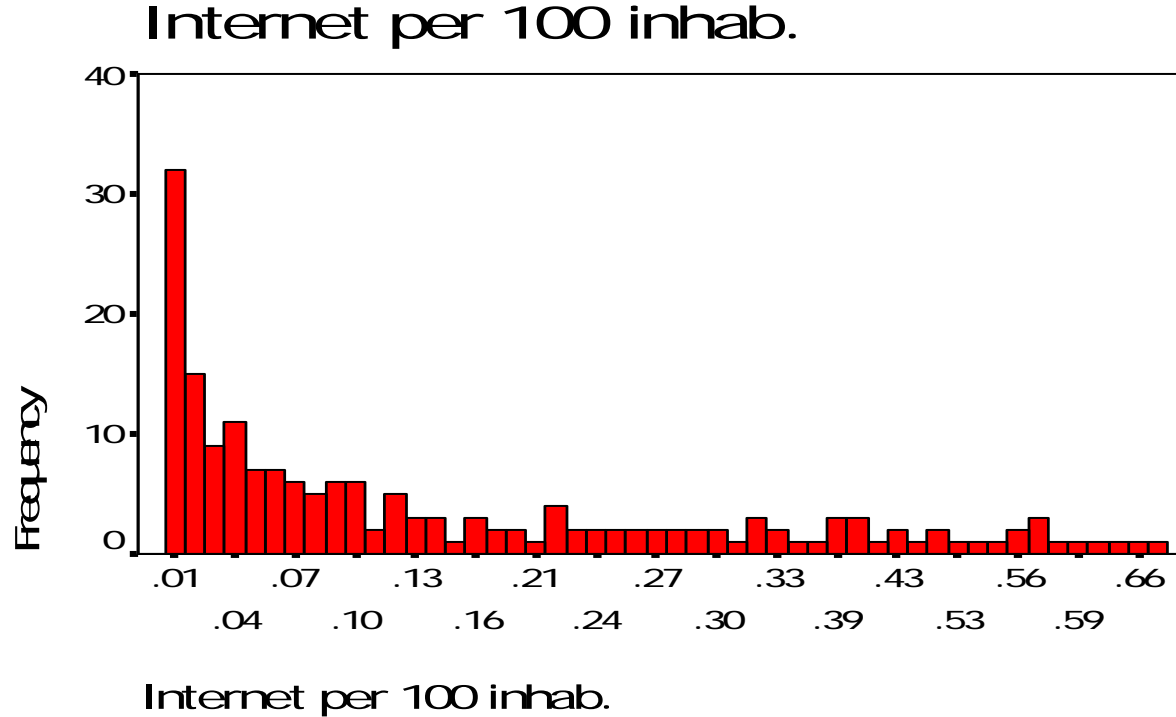
Average score: .20 ; Gini Coefficient : 0.59 ;



Countries scored a lower value in Infrastructure than Opportunity

Maximum score in Infrastructure is only .76, while it is was 1.00 in Opportunity

Average score:.24 Gini Coefficient : 0.50;

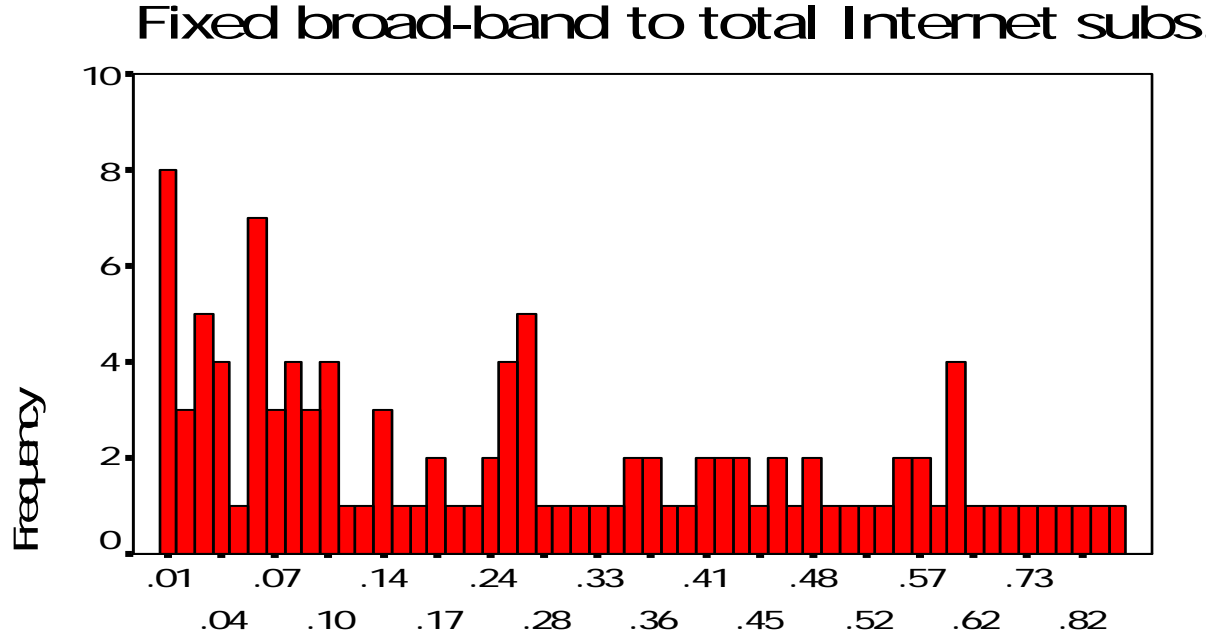


Similar pattern to that of Internet connected household

It is a little better than Internet connected household, average score is .16 while Internet connected household is .14

Average: .16 ; Gini Coefficient : 0.59;

Broadband Ratio in the Fixed Internet



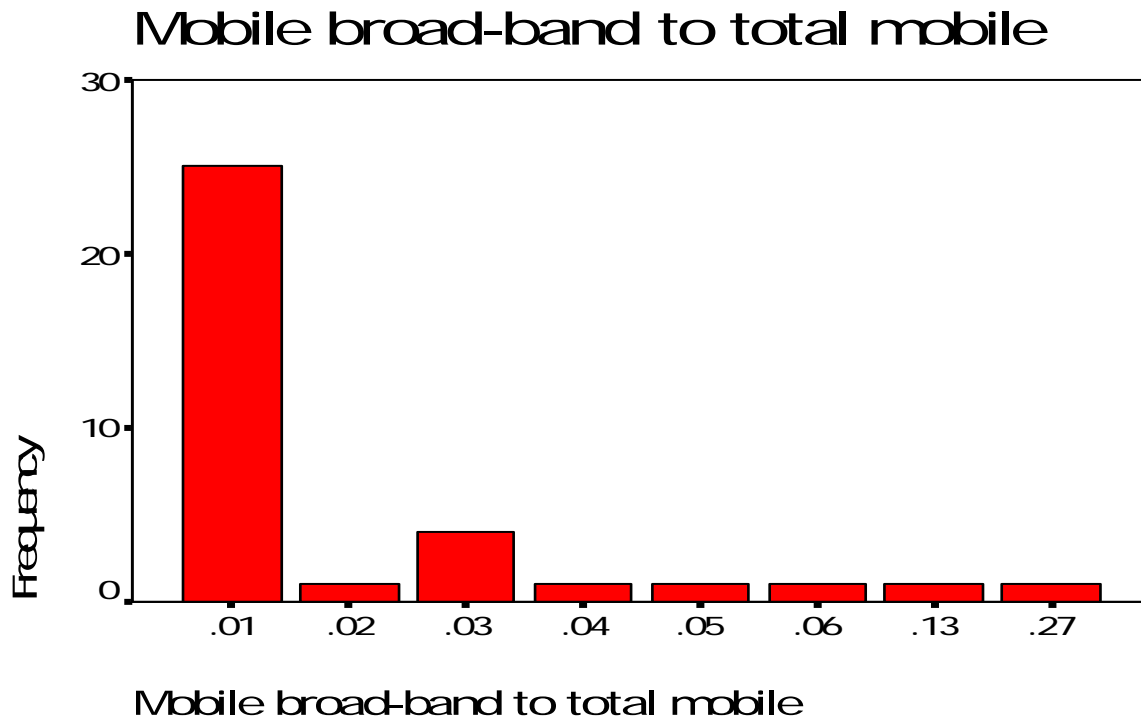
Fixed broad-band to total Internet subs.

It is lower than 50% in the 80% of countries

But there is one country which already reached 100%

Average score: .28 ; Gini Coefficient : 0.68 ;

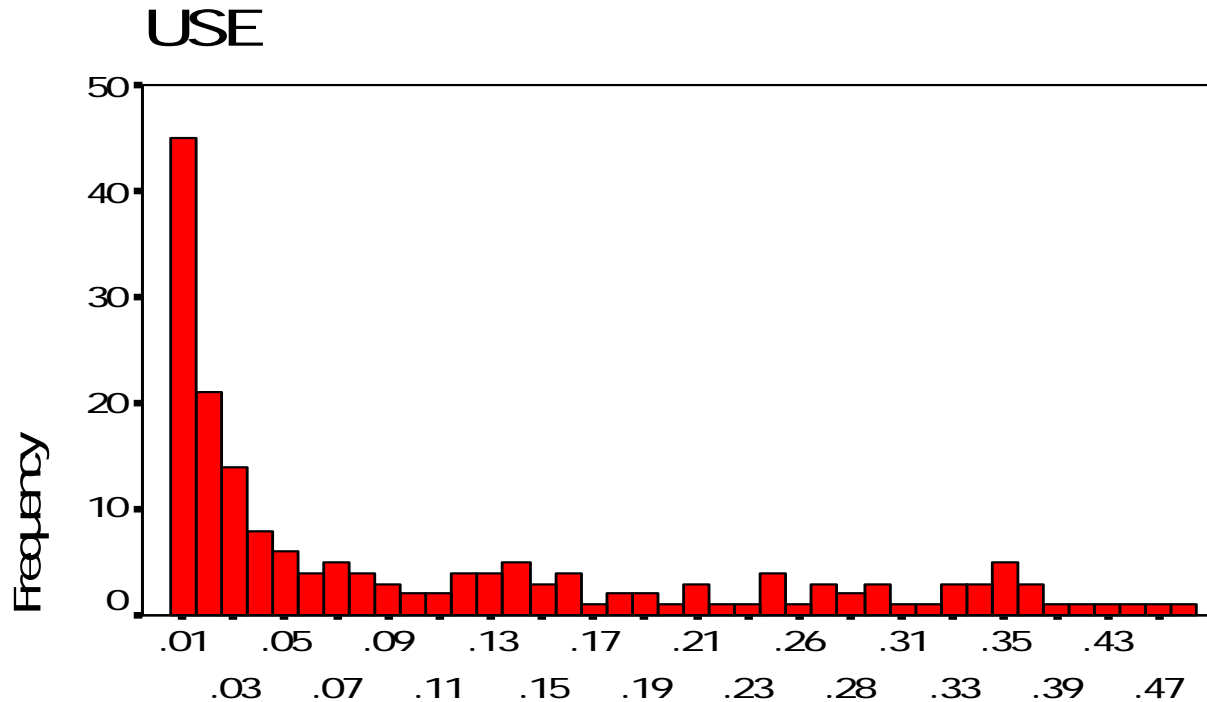
Broadband Ration in the Mobile Internet



Broadband connection in the mobile is very rare

Average score:.02

Gini Coefficient : 0.96;



USE

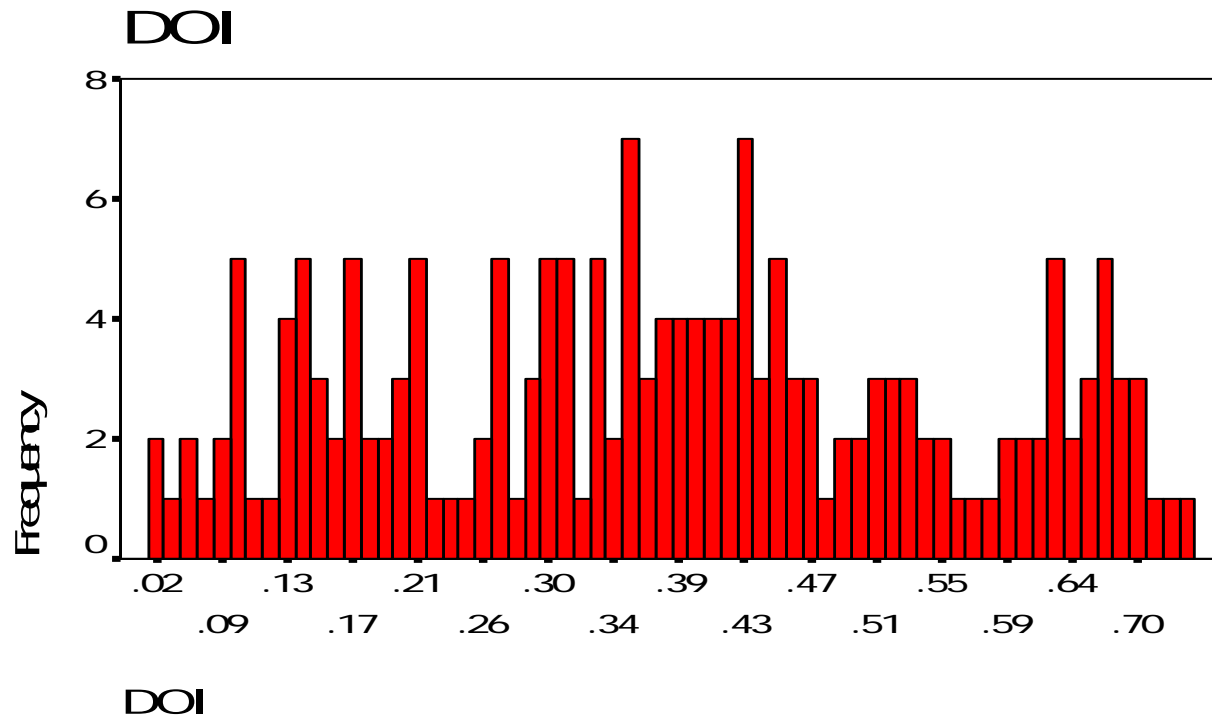
Utilization score is lowest, even lower than Infrastructure

Maximum value is only .64

Average score: .11

Gini Coefficient : 0.61

Overall DOI Score



The distribution of overall DOI score is similar to the bell typed normal distribution

Half is lower than average(.37) and another half is higher than average

Average score:.37 ; Gini Coefficient : 0.28

Summary of Indicators

	Minimum	Maximum	Average	Gini
Mobile coverage	.10	1.00	.75	.18
Internet price	.04	1.00	.85	.26
Mobile price	.08	1.00	.90	.12
Household with fixed line	.01	.98	.44	.43
Mobile users	.01	1.00	.37	.51
Household with Internet Connection	.01	.81	.14	.67
Mobile Internet users	.01	.58	.05	.84
Household with PC	.01	.86	.20	.59
Internet users	.01	.75	.16	.59
% Broadband in the fixed	.01	1.00	.28	.68
% Broadband in the mobile	.01	0.27	.02	.96

Classification of Countries

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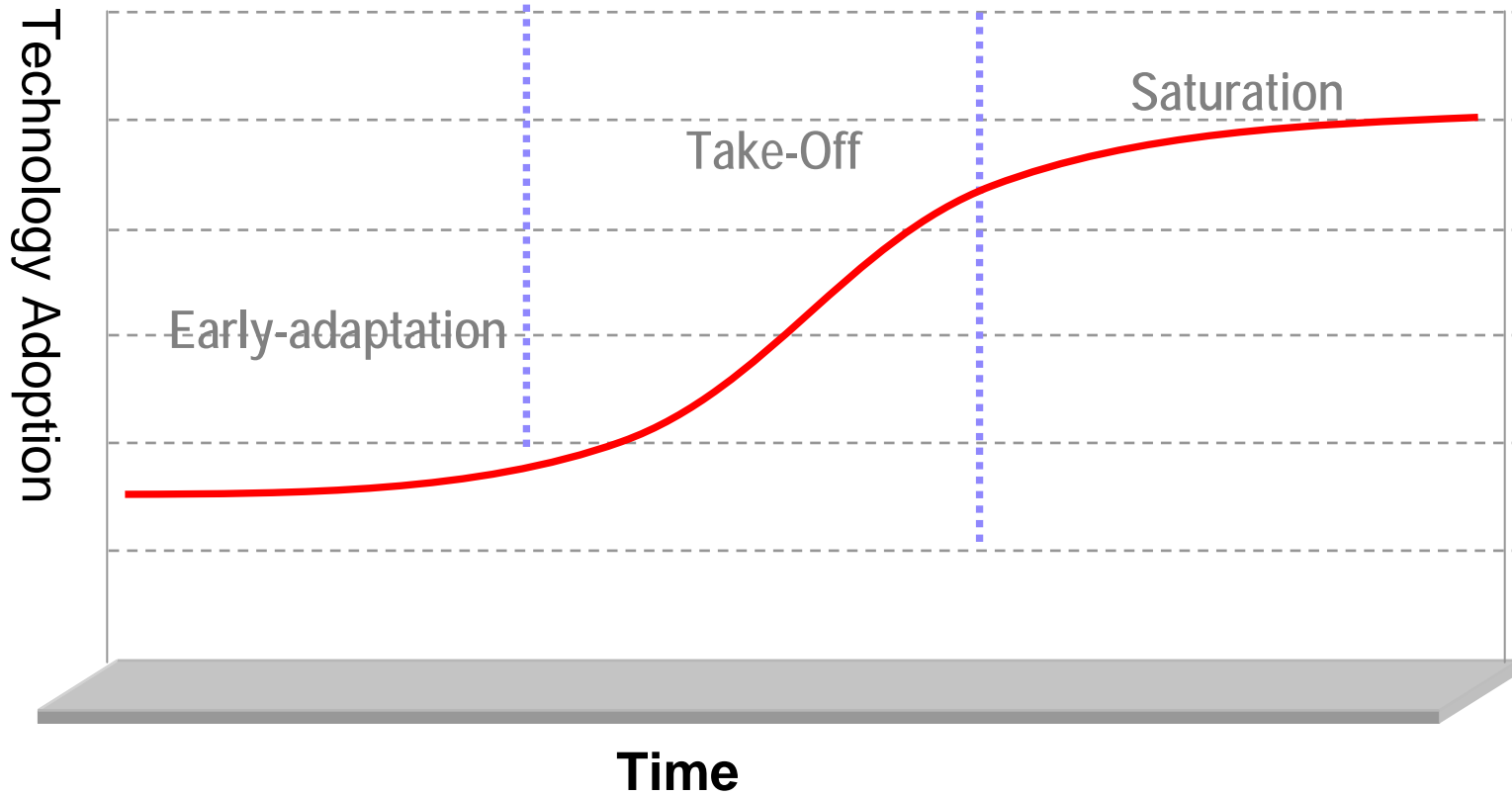
by Score of DOI



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Technology Adoption Process

Technology Adoption Curve



Criteria for Classification of Countries by DOI score



	Before starting	Beginning	Take off	Matured
ICT status	Very poor	poor	less developed	developed
Policy	No adequate policy	Initial stage	Full Implementation	Paradigm shift
Government intervention	Almost no intervention	Government intervention started	Maximum government intervention	Minimum Government intervention
Market	Monopoly	Minimum competition	Increasing competition	Full competition

Classification of Countries by 11 Indicators

	Before starting	Beginning	Take off	Matured
Mobile coverage	49% (23%)	50–74% (17%)	75–94% (30%)	95% (30%)
Internet price	25% (21%)	24–10% (20%)	9–3% (29%)	2% (30%)
Mobile price	20% (18%)	19–10% (12%)	9–3% (30%)	2% (40%)
Household with fixed line	24% (40%)	25–49% (14%)	50–74% (21%)	75% (25%)
Mobile users	24% (49%)	25–49 (21%)	50–74% (10%)	75 (20%)
Household with Internet Connection	4% (50%)	5–14 (24%)	15–49% (16%)	50 (10%)
Mobile Internet users	4% (80%)	5–14 (10%)	15–49% (9%)	50% (1%)
Household with PC	4% (40%)	5–14 (23%)	15–49% (22%)	50% (15%)
Internet users	4% (40%)	5–14 (25%)	15–49 (25%)	50% (10%)
% Broadband in the fixed	4% (50%)	5–14% (15%)	15–49% (25%)	50% (10%)
% Broadband in the mobile	4% (97%)	5–14% (2%)	15–49% (1%)	50% (0%)

Classification of Countries by DOI Score

	Before starting	Beginning	Take off	Matured
Opportunity	0- .68 [29%]	.69-.85 [15%]	.86-.96 [25%]	.97-1.0 [31%]
Infra-structure	0-.17 [50%]	.18-.37 [22%]	.38-.66 [20%]	.67-1.0 [8%]
Utilization	0-.04 [48%]	.05-.14 [21%]	.15-.49 [30%]	.50-1.0 [1%]
Overall DOI Score	0-.30 [37%]	.31-.45 [32%]	.46-.70 [29%]	.71-1.0 [1%]

Analysis by the Combination of Indicators

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Internet users by Internet price and Internet Connected Household

Internet Price

Internet Connected Household

	high	middle	low	very low
very low	0.02(55)	0.05(21)	0.07(11)	0.05(3)
low	0.05(2)	0.12(13)	0.15(18)	0.18(8)
middle			0.28(7)	0.30(22)
high				0.55(20)

Internet users by Internet price and GNI

Internet Price

GNI

	high	middle	low	very low
very low	0.02(40)	0.05(7)	0.13(3)	0.3(2)
low	0.04(11)	0.09(22)	0.10(14)	0.24(3)
middle	0.08(2)	0.07(5)	0.19(16)	0.19(12)
high	0.01(1)		0.20(2)	0.45(29)

Internet users by Internet Connected Household and GNI

Internet Connected Household

GNI		Very low	low	middle	high
	very low	0.02(47)	0.19(3)	0.30(2)	
	low	0.06(29)	0.11(20)		0.58(1)
	middle	0.05(5)	0.17(17)	0.29(9)	
	high	0.01(1)	0.16(1)	0.30(14)	0.56(16)

Mobile users by Mobile price and Mobile Coverage

Mobile Price

Mobile Coverage

	high	middle	low	Very low
Very low	0.04(18)	0.04(9)	0.13(7)	
low	0.08(16)	0.11(3)	0.12(8)	0.10(3)
middle	0.08(5)	0.17(7)	0.30(23)	0.32(10)
high		0.20(3)	0.47(11)	0.76(57)

Mobile users by Mobile price and GNI

Mobile Price

GNI

	high	middle	low	Very low
Very low	0.06(32)	0.04(9)	0.05(9)	0.55(4)
low	0.11(1)	0.18(12)	0.31(28)	0.30(9)
middle	0.07(3)		0.36(12)	0.51(20)
high	0.01(1)		0.58(1)	0.87(30)

Mobile users by Mobile Coverage and GNI

Mobile Coverage

	Very low	low	middle	High	
GNI	Very low	0.06(32)	0.04(9)	0.05(7)	0.55(4)
	low	0.11(1)	0.18(12)	0.31(28)	0.30(9)
	middle	0.07(3)		0.36(12)	0.51(20)
	high	0.01(1)		0.06(1)	0.87(30)

Open discussion



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● Items to be discussed

- **Validity of the process of policy development**
- **Validity of the classification of country**
- **Further suggestion for combination of indicators**
- **Suggestion of further follow up**