Defining and Measureing EQUITY IN OPPORTUNITY:
Empirical Analysis from Selected Asian Countries

Nanak. Kakwani

Email: n.kakwani@unsw.edu.au

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Our Framework

▪Opportunities are inputs that impact outcomes both directly and indirectly.

▪ Access to basic services in education, health, nutrition and basic infrastructure such clean water, electricity, sanitation etc are opportunities in non-income dimension .

▪ Causes of inequality in opportunities are largely due to entitlement failures, which can occur due to sickness, unemployment, prices of basic services increase sharply.

▪ Economic growth creates opportunities.

▪ Government plays a key role in creating opportunities for all

World Bank Framework

▪ Inequality is usually measured in income or consumption, which is inequality of outcome, which is determined by many complex factors. The labor market plays a key role in determining inequality.

▪ There are two factors that determine inequality:
➢ Circumstance variables: Gender, race, place of birth, father's education, mother's education and father's occupation. Mother's occupation is not included.
➢ Effort factors: These are determined by individual choice or efforts.

▪ World Bank framework is exactly the same as that of Roamer (1998):

$$I = I(C) + I(E).$$

Total Inequality is sum of inequality due to individual circumstances and inequality due to efforts.
▪ Individuals cannot be held responsible for inequality caused by due to circumstances which is unjust and unfair. This is called inequality of opportunity.
▪Inequality due to efforts is good generating greater prosperity for the society.

Conceptual Issues with World Bank Framework

- **There cannot be a general consensus on set of circumstance and effort variables.**
- **$I(C)$ is measured from regression model with finite number circumstance variables. This inequality is underestimated. Its values is around 20-25%.**

Inequality is estimated from per capita household income. Values of circumstance variables vary among individuals within household. We may not always able to find composite circumstance variables for each household.

Some circumstance variables can be defined for a household as a whole such as race, location, religion, gender or age of head but some variables such as education of mother and father can not always be easily identifiable to Individuals. Each individual within the household benefit differently from household circumstances.

Individual household members exert different efforts. We may not get a composite effort variables for households. For instance, parents may put efforts to create conditions for children to flourish in life so parents efforts become children's circumstances.

- **Parents telling bed time stories to children is bad for the society.**

Conceptual Issues with World Bank Framework (continue

- **Poverty should always be concern to the society whether caused by circumstances or lack of individual efforts**.

- **Policy Makers dilemma.**

▪**How can policy makers change individuals' circumstances such as education of father or mother ?**

Social Opportunity Function

Inequality of opportunity is caused due to entitlement failure. That can occur due to factures such as unemployment, sickness, death of bread earners etc.
The circumstance variables do not always cause entitlement failure. Mother's Education may not lead to entitlement failure.

Per capita income is a means to access basic opportunities. The government can increase access to opportunity through social programs (safety net).
A general social welfare function is given by

$$W = W[x_1, x_2, \ldots \ldots \ldots, x_n]$$

Similar to social welfare function . We define social opportunity function (SOF)

$$SOF = SOF(O(x_1), O(x_2), \ldots \ldots \ldots, O(x_n)) = SOF(\mu_0, E_0)$$

which is a function of two factors:
- Average opportunity available to the societ y
- Equity of opportunity (how opportunities are distributed across income.

A Specific Social Opportunity Function

$$SOF(\tilde{O}) = 2 \int_0^\infty O(x)[1 - F(x)]f(x)dx$$

The poorer a person, the greater weight is given to her opportunity. This function Captures the individual deprivation by weighing the opportunity of the individual by the percentage of individuals who have higher income than her.

$$SOF(\tilde{O}) = \mu_O(1 - C_O) = \mu_O E_O$$

where μ_O is the average opportunity in the population and E_O Is a measure Of equity of opportunity.

$E_O = 1$ Implies that all individuals enjoy the same opportunity irrespective of their family income.

$E_O > 1$ Opportunities are equitable because poor persons enjoy more opportunity than the rich.

$E_O < 1$ Opportunities are inequitable; rich enjoy more opportunity than poor

Social Objective

The government's social objective is to maximize SOF either by expanding average opportunities or by increasing equity in opportunity or by increasing both simultaneously. If there is a tradeoff between the two, then both cannot be increased.

An Example : Investment in higher education to increase human capital.

Investment increases the access of population to higher education from 10% to 20%

The poor cannot afford to pay for the cost of education equity index reduces from 0.3 to 0.1, then net effect on SOF will be reduction from 3% to 2%. Hence this investment will be socially undesirable unless the government provides more scholarships to the poor students.

Table 7.1. Percentage of Children Aged 6-11 Attending School in Indonesia

Indicators	2000	2009	Growth rate
Number of children 6-11 years (million)	24.97	26.57	0.69
% children attending school (average opportunity)	87.03	94.29	0.89
Equity index	0.98	0.99	0.09
Social opportunity function	85.18	93	0.98
Number of children deprived of opportunity (million)	3.24	1.52	-8.08

Table 7.2. Percentage of Children Aged 12-17 Attending School in Indonesia

Indicators	2000	2009	Growth rate
Number of children 12-17 years (million)	26.2	25.35	-0.36
% children attending school (average opportunity)	74.72	80.58	0.84
Equity index	0.93	0.94	0.1
Social opportunity function	69.46	75.57	0.94
Number of children deprived of opportunity (million)	6.62	4.92	-3.24

Table 7.4. Percentage of Children Attending School in Bangladesh in 2000

Indicators	6-11 years	12-17 years
Number of children (million)	21.41	17.93
% children attending school (average opportunity)	75.59	58.25
Equity index	0.93	0.88
Social opportunity function	70.6	51.24
Number of children deprived of opportunity (million)	5.23	7.49

Table 7.5. Percentage of Children Attending School in Pakistan in 2007-08

Indicators	6-11 years	12-17 years
Number of children (million)	21.68	19.4
% children attending school (average opportunity)	74.57	56.15
Equity index	0.9	0.83
Social opportunity function	66.91	46.44
Number of children deprived of opportunity (million)	5.51	8.51

Table 7.6. Percentage of Children Aged 6-11 Attending School in Sri Lanka

Indicators	2006-07	2009-10	Growth rate
Number of children 6-11 years (million)	2.45	2.1	-4.98
% children attending school (average opportunity)	98.74	99.39	0.22
Equity index	0.99	1	0.14
Social opportunity function	98.21	99.27	0.36
Number of children deprived of opportunity (million)	0.03	0.01	-25.27

Table 7.7. Percentage of Children in Aged 12-17 Attending School in Sri Lanka

Indicators	2006-07	2009-10	Growth rate
Number of children 12-17 years old (million)	2.65	2.08	-7.69
% children attending school (average opportunity)	83.54	86.38	1.12
Equity index	0.96	0.97	0.37
Social opportunity function	79.79	83.43	1.5
Number of children deprived of opportunity (million)	0.44	0.28	-13.34

Table 7.8. Percentage of Children Aged 6-11 Attending School in Vietnam

Indicators	2002	2008	Growth rate
Number of children 6-11 years (million)	10.17	7.57	-7.1
% children attending school (average opportunity)	94.17	96.31	0.56
Equity index	0.98	0.98	0.1
Social opportunity function	92.32	94.8	0.66
Number of children deprived of opportunity (million)	0.59	0.28	-17.15

Table 7.9. Percentage of Children Aged 12-17 Attending School in Vietnam

Indicators	2002	2008	Growth rate
Number of children 12-17 years (million)	11.78	11.56	-0.47
% children attending school (average opportunity)	75.68	81.97	2.02
Equity index	0.94	0.95	0.11
Social opportunity function	71.23	77.49	2.13
Number of children deprived of opportunity (million)	2.86	2.08	-7.64

Table 7.10. Percentage of Children Aged 6-11 Attending School in the Philippines

Indicators	2002	2007	Growth rate
Number of children 6-11 years (million)	11.76	13.04	2.6
% children attending school (average opportunity)	93.92	94.38	0.12
Equity index	0.98	0.98	0.02
Social opportunity function	91.58	92.11	0.14
Number of children deprived of opportunity (million)	0.72	0.73	0.59

Table 7.11. Percentage of Children Aged 12-17 Attending School in the Philippines

Indicators	2002	2007	Growth rate
Number of children 12-17 years (million)	10.49	13.17	5.84
% children attending school (average opportunity)	83.09	79.53	-1.09
Equity index	0.95	0.94	-0.27
Social opportunity function	78.63	74.43	-1.36
Number of children deprived of opportunity (million)	1.77	2.7	11.03

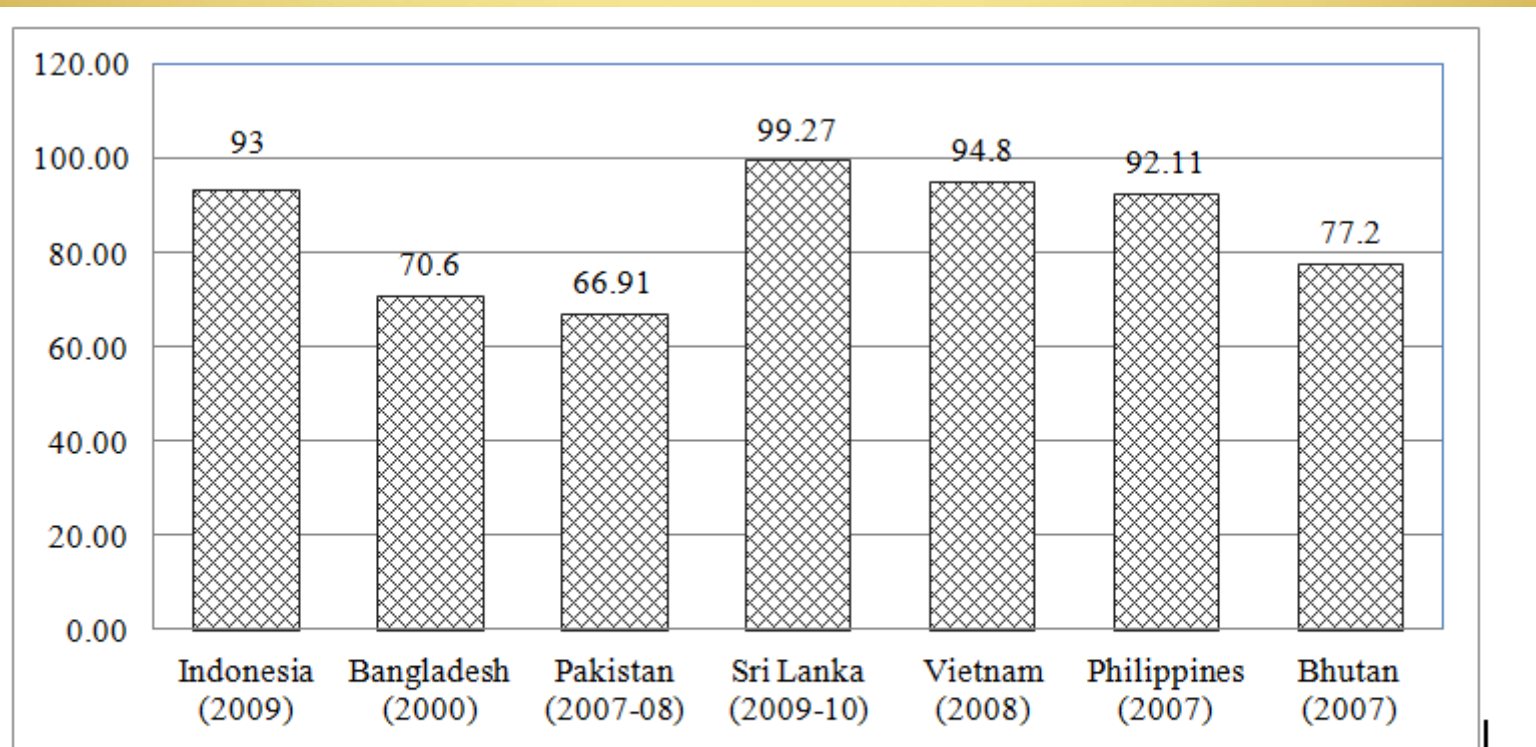# Opportunities in Asian Countries: Primary school age

Figure 7.1. Opportunity index for the children in the primary school age group in selected Asian countries

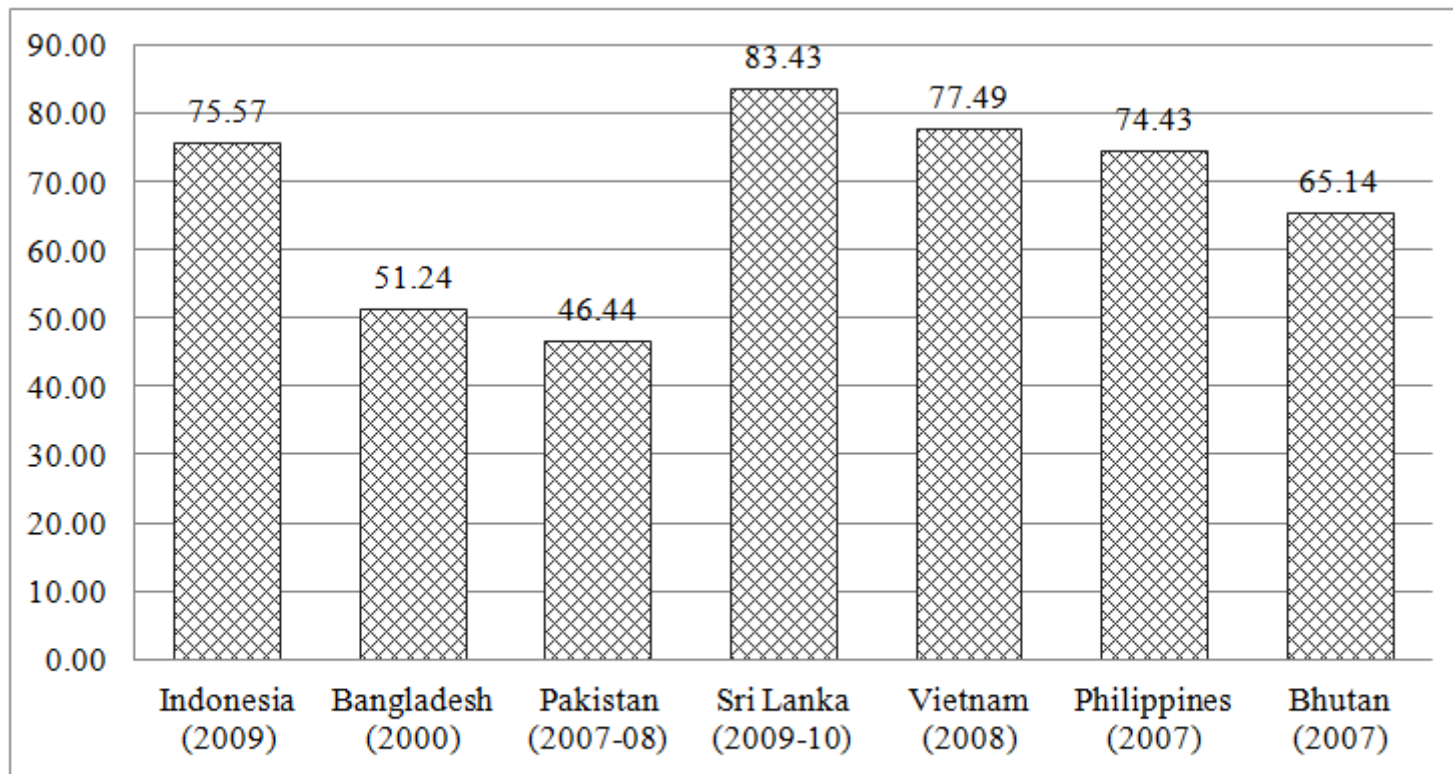# Opportunity in Asian Countries : Secondary school age

Figure 7.2.Opportunity index for the children in the secondary school age group in selected Asian countries.

Table 7.14. Opportunity in Access to Trained Health Personnel during Delivery in Indonesia in 2014

Indicators	Doctors	Midwife	Others
Average opportunity (%)	18.7	65.1	16.2
Equity in opportunity	0.76	1.12	1.36
Social opportunity Function	30.6	58.9	9.5

Table 7.15. Opportunity in Child Vaccination in Indonesia in 2014

Indicators	BCG	DPT	Polio	Measles	Hepatitis B
Average opportunity (%)	93.4	90.7	90.7	78.5	87.5
Inequity in opportunity	0.99	0.99	0.99	0.99	0.98
Social opportunity function	92.31	89.91	89.86	77.67	86.14

Table 7.16. Utilization and Equity in Health Care in Indonesia in 2014

Indicators	Government hospital	Private Hospital	Community health center
Average opportunity (%)	2.88	1.77	0.45
Equity in opportunity	0.78	0.54	1.17
Social opportunity function	2.25	0.95	0.53

Table 7.17. Utilization and Equity in Health Care in the Philippines in 2007

Indicators	Government hospital	Private hospital	Private Clinic	Rural health unit	Barangay health station
Average opportunity (%)	29.04	19.23	21.82	20.18	15.55
Equity in opportunity	0.91	0.51	0.59	1.12	1.18
Social opportunity function	26.28	9.79	12.91	22.64	18.33

Table 7.18. Types of Treatment Sought by ill People in the Philippines in 2007

Indicators	No treatment	Self treatment	Medical professional	Traditional
Average opportunity (%)	5.37	55.29	33.37	5.85
Equity in opportunity	1.18	1.09	0.84	1.36
Social opportunity function	6.31	60.52	28.04	7.98

Equity in health services : Vietnam 2008
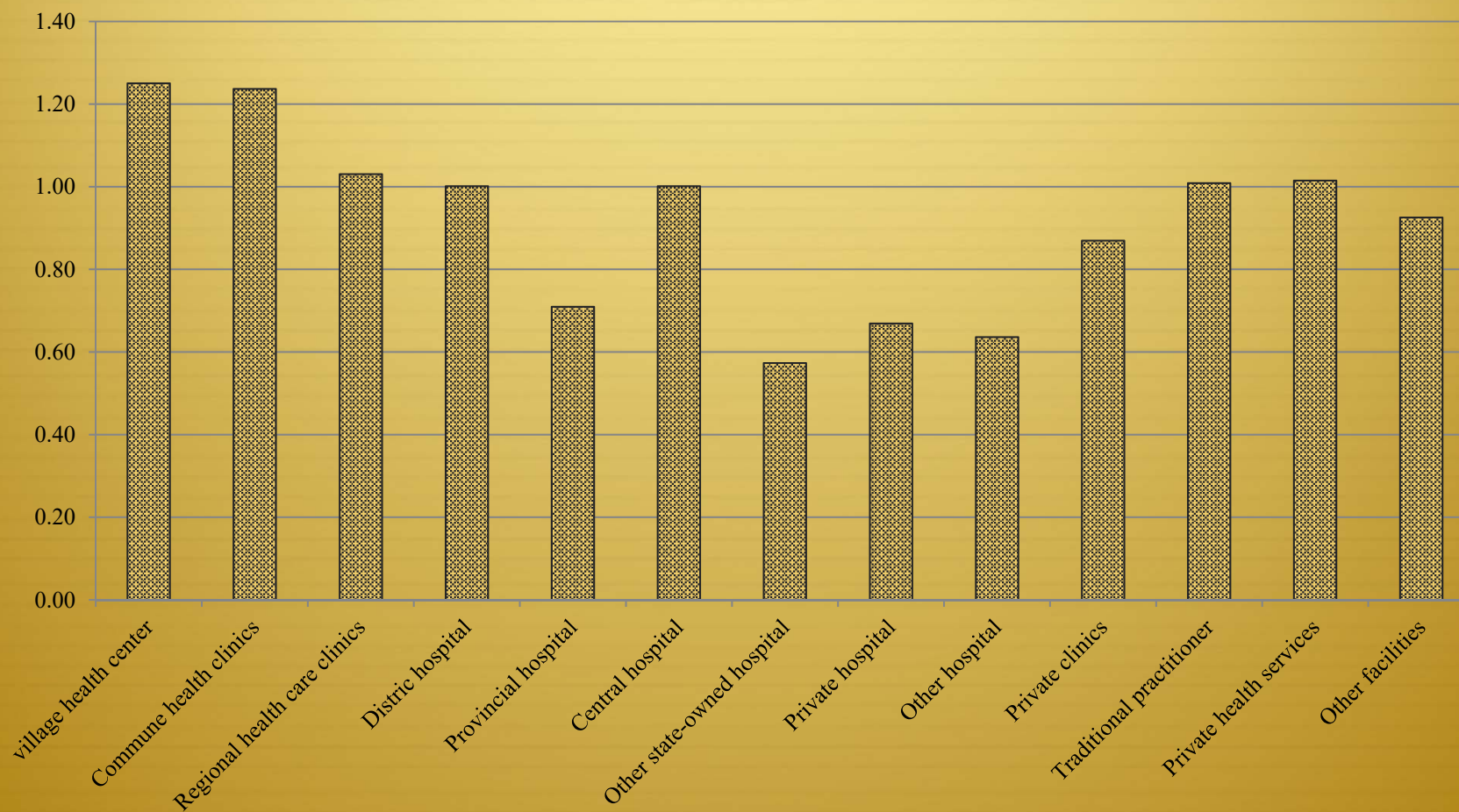
Some Conclusions

While notable improvement in education opportunities was seen in Sri Lanka, Vietnam, and Indonesia. Philippines, Bangladesh, Bhutan, and Pakistan have encountered challenges in this area.

In Philippines, while opportunities to attend primary school has held steady in 2000-07 opportunities for secondary school age children have declined significantly and became less equitable. In Bhutan, Bangladesh, and Pakistan economic circumstance of parents largely determined the availability of basic education opportunities to children.

In Indonesia, the equity index for doctor-assisted child birth is only 0.76, which means that a large proportion of poor women do not have access to services of qualified health personals during child delivery.

Immunization is one of the least expensive health interventions. In Indonesia, family circumstances do not influence access to vaccination, but the coverage for child vaccination needs to be expanded.