Measuring Inclusive Growth

IFZAL ALI AND HYUN HWA SON

This study proposes an approach to measuring inclusive growth. It draws from the idea of a social opportunity function akin to a social welfare function. In this context, growth is defined as inclusive if it increases the social opportunity function, which depends on two factors: (i) average opportunities available to the population, and (ii) how opportunities are shared among the population. In part, the inclusiveness of growth can be captured by means of an opportunity curve, which has a one-to-one relationship with the social opportunity function. To complement the shortcoming of the opportunity curve particularly partial ranking, the study also develops the opportunity index to provide a complete ranking. These tools are applied to the Philippines to analyze the access to and equity of opportunities in education and health. More importantly, the empirical application illustrates how these tools can be useful in the dynamic analysis of inclusive growth, as they evaluate changes in opportunities over time.

I. INTRODUCTION

The dramatic reduction in poverty achieved in parts of Asia is well-documented. Overall between 1990 and 2001, the number of people living on less than $1-a-day declined from 931 to 679 million, or from 31 to 20 percent of a growing population (ADB 2006). These successes are closely associated with rapid growth, and driven in particular by high growth rates in a few countries including People's Republic of China, India, and Viet Nam.

While some level of growth is obviously a necessary condition for sustained poverty reduction, and strong average growth has been accompanied by a sharp reduction in poverty, the evidence is clear that growth by itself is not a sufficient condition. Growth does not guarantee that all persons will benefit equally. Growth can bypass the poor or marginalized groups, resulting in increasing inequality. High and rising levels of income inequality can lower the impact on poverty reduction of a given rate of growth, and can also reduce the growth rate itself. High inequality also has implications for political stability and social cohesion needed for sustainable growth (ADB 2007a and b). Hence, reducing inequality has become a major concern of development policy, a concern that has generated interest in inclusive growth. While there remains no

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consensus on how to define or measure inclusive growth, the issue has generated a certain amount of policy and academic debate.

Very recently, the report of the Eminent Persons Group that was initiated by the Asian Development Bank (ADB 2007c) made reference to the term "inclusive growth", which emphasizes ensuring that the economic opportunities created by growth are available to all—particularly the poor—to the maximum possible extent (see also Ali and Zhuang 2007). The growth process creates new economic opportunities that are unevenly distributed. The poor are generally constrained by circumstances or market failures that constrain them from availing these opportunities. As a result, the poor generally benefit less from growth than the nonpoor. Thus, growth will generally be not pro-poor if left completely to markets. The government, however, can formulate policies and programs that facilitate the full participation of those less well off in the new economic opportunities. We may thus define inclusive growth as growth that not only creates new economic opportunities, but also one that ensures equal access to the opportunities created for all segments of society, particularly for the poor.

Consistent with this definition, this paper provides an approach to measuring inclusive growth. The study proposes a new methodology to capture inclusive growth, based on a social opportunity function that is similar to the idea of a social welfare function. The paper is organized in the following manner. Section II is devoted to describing the methodology. Section III provides discussion of the empirical results. For the empirical study, we have used data culled from the Philippines's Annual Poverty Indicator Survey (APIS) conducted in 1998 and 2004. Finally, Section IV concludes the study.

II. METHODOLOGY

Inclusive growth may be measured using the idea of a social opportunity function, which is similar to a social welfare function. Hence, it can be said that inclusive growth leads to the maximization of the social opportunity function. To be consistent with our definition of inclusive growth, we propose a methodology to measure growth inclusiveness in terms of increasing the social opportunity function, which depends on two factors: (i) average opportunities available to the population, and (ii) how opportunities are shared or distributed among the population. This social opportunity function gives greater weight to the opportunities enjoyed by the poor: the poorer a person is, the greater the weight will be. Such a weighting scheme will ensure that opportunities created for the poor are more important than those created for the nonpoor, i.e., if the opportunity enjoyed by a person is transferred to a poorer person in society, then social opportunity must increase, thus making growth more inclusive.

Suppose there are n persons in the population with incomes $x_1, x_{2, \ldots\ldots\ldots}, x_n$, where x_1 is the poorest person and x_n is the richest. Then we define a social welfare function as

$$W = W(x_{1,} x_2, \ldots\ldots\ldots\ldots, x_n) \tag{1}$$

which is an increasing function of its arguments. Similar to this idea of social welfare function, we can define a social opportunity function:

$$O = O(y_1, y_2, \ldots\ldots\ldots\ldots, y_n) \tag{2}$$

where y_i is the opportunity enjoyed by the ith person who has income x_i. Opportunity can be defined in terms of various services, e.g., access to a health or educational service, access to job opportunity in the labor market, etc. y_i can take binary values 0 and 100. It takes the value 0 if the ith person is deprived of a certain opportunity, and takes the value 100 when the ith person has that opportunity. The average opportunity for the population is then defined as

$$\bar{y} = \frac{1}{n}\sum_{i=1}^{n} y_i \tag{3}$$

which is the percentage of the population who enjoys a given opportunity.[1]

The opportunity function should be an increasing function of its arguments. If the opportunity of any person increases, then the social opportunity function must increase. Economic growth must expand the average opportunities available to the population. This is a necessary, but, by no means, sufficient requirement to achieve inclusive growth. The poor are generally constrained in availing these opportunities. Inclusive growth therefore should not only expand average opportunities, but also improve the distribution of opportunities across the population. If our development model is entirely focused on the maximization of $\bar{y}$ as defined in (3), we are completely ignoring the distribution of opportunities. To bring in distribution considerations, we require the social opportunity function to satisfy the transfer principle: any transfer of opportunity from a poorer person to a richer person must decrease the social opportunity

[1]Since y_i is a binary variable that takes a value 0 or 100, the average $\bar{y}$ is exactly equal to the percentage of the population who has access to a certain opportunity. To clarify this, suppose p is the probability that an individual selected from the population has access to an opportunity and (1-p) is the probability that the selected individual does not have access the opportunity. Given that, the average opportunity available to the population is equal to $100 \times p + 0 \times (1 - p) = 100 \times p$, which is simply the percentage of the people that has access to the opportunity.

function. Without loss of generality, we can suppose that t amount of opportunity is transferred from a poorer person with income x_1 to a richer person with income x_2. After the transfer, the poorer person will have $y_1 - t$ opportunities and the richer person will enjoy $y_2 + t$ opportunities. Such transfers should reduce the social opportunity function. Following from that, the social opportunity function must satisfy the following requirement:

$$O(y_1 - t, y_2 + t, y_3, ..., y_n) \leq O(y_1, y_2, y_{3,} ....., y_n) \tag{4}$$

which must hold for all non-negative values of t.

Let us denote the opportunity distribution vector $Q(t)$ by

$$Q(t) \approx (y_1 - t, y_2 + t, y_3, ..., y_n) \tag{5}$$

From (4), it can be said that the vector $Q(0)$ is opportunity superior to the vector $Q(t)$, i.e., the vector $Q(0)$ will always provide equal or greater social opportunities than the vector $Q(t)$ for all non-negative values of t. A cumulative distribution of $Q(t)$ can be constructed as:

$$Q^C(t) \approx \left(y_1 - t, \frac{y_1 + y_2}{2}, \frac{y_1 + y_2 + y_3}{3}, ..., \frac{y_1 + y_2 + ... + y_n}{n} \right) \tag{6}$$

which is the distribution of cumulative means of $Q(t)$ when the individuals are arranged in ascending order of their incomes. Analogous to the generalized Lorenz curve, $Q^C(t)$ may be called the generalized concentration curve of the distribution $Q(t)$.[2] Similarly, the generalized concentration curve of the distribution $Q(0)$ is given by

$$Q^C(0) \approx \left(y_1, \frac{y_1 + y_2}{2}, \frac{y_1 + y_2 + y_3}{3}, ..., \frac{y_1 + y_2 + ... + y_n}{n} \right) \tag{7}$$

Comparing (6) and (7) it is evident that the generalized concentration curve $Q^C(0)$ will always be higher than the generalized concentration curve $Q^C(t)$ for all t and $t > 0$ (i.e., non-negative values of t). Thus we have shown that if the distribution y denotes opportunity superior to the distribution y^*, then the distribution y will always have a higher generalized concentration curve.

[2]See Kakwani (1980) for detailed discussions on the concentration curve.

Similarly, we can prove that if the distribution y has a higher generalized concentration curve than y^*, then distribution y will always give a greater social opportunity function. Thus, by looking at the generalized concentration curves of two distributions, we can judge which of these two will provide greater social opportunities provided the two generalized concentration curves do not intersect.

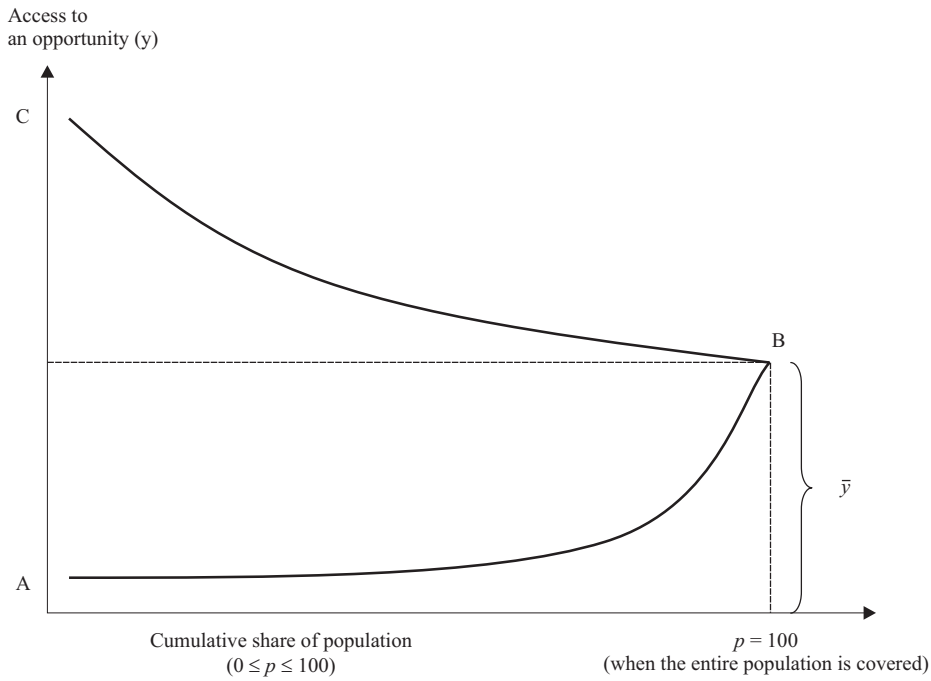
To make the above idea operational, it will be useful to formulate the problem in terms of continuous distribution. Suppose we arrange the population in ascending order of their incomes. Suppose further that $\bar{y}_p$ is the average opportunity enjoyed by the bottom p percent of the population, where p varies from 0 to 100 and $\bar{y}$ is the mean opportunity that is available to the whole population, then $\bar{y}_p$ will be equal to $\bar{y}$ when $p = 100$ (which covers the whole population).

As $\bar{y}_p$ varies with p, we can draw a curve $\bar{y}_p$ for different values of p. This is, in fact, a generalized concentration curve of opportunity when the individuals are arranged in ascending order of their incomes. We may call this curve as the opportunity curve: the higher the curve, the greater the social opportunity function. Thus growth will be inclusive if it shifts the opportunity curve upward at all points. If the entire opportunity curve shifts upward, this implies that everyone in society—including the poor—is enjoying an increase in opportunities, and hence we may call such a growth process as unambiguously inclusive. The degree of inclusiveness, however, will depend on (i) how much the curve is shifting upward and (ii) in which part of the income distribution the shift is taking place.

If the opportunity curve is sloping downward, then we can say that opportunities available to the poor are more than those available to the nonpoor (i.e., the opportunities are distributed equitably). Similarly, if the curve is sloping upward, opportunities are distributed inequitably (antipoor). Figure 1 depicts two opportunity curves with the same mean ($\bar{y}$): one is sloping upward (AB) and the other is sloping downward (CB). The curve CB indicates equitable distribution of opportunities, meaning that the poor at the bottom end of the distribution have greater opportunity than the nonpoor at the top end. The upward-sloping curve AB, on the other hand, indicates the opposite: the poor enjoy less opportunities than the nonpoor.

The opportunity curve can be useful to assess the pattern of growth that is defined in terms of access to and equity of opportunities available to the population, without specifying a social opportunity function. However, it is unable to quantify the precise magnitude of the change, i.e., one cannot be conclusive as to how much changes in opportunities have occurred over time. In this respect, the opportunity curve provides only partial rankings of opportunity distributions.

Figure 1. **Opportunity Curves**



To be able to capture the magnitude of the change in opportunity distributions, we need to make a stronger assumption about the form of the social opportunity function used. One simple form of the social opportunity function can be obtained by calculating an index from the area under the opportunity curve as denoted below:

$$\bar{y}^* = \int_0^1 \bar{y}_p dp \tag{8}$$

which is our proposed opportunity index (OI). The greater $\bar{y}^*$ is, the greater will be the opportunities available to the population. Our development objective should be to maximize the value of $\bar{y}^*$

If everyone in the population enjoys exactly the same opportunity, then it can be shown that $\bar{y}^*$ will be equal to $\bar{y}$. As such, the deviation of $\bar{y}^*$ from $\bar{y}$ provides an indication of how opportunities are distributed across the population. If $\bar{y}^*$ is greater than $\bar{y}$, then opportunities are equitably distributed (pro-poor).

Similarly, if $\bar{y}^*$ is less than $\bar{y}$, then opportunities are inequitably distributed (antipoor). Thus we propose an equity index of opportunity (EIO):

$$\varphi = \frac{\bar{y}^*}{\bar{y}} \tag{9}$$

which implies that opportunities are equitably (inequitably) distributed if φ is greater (less) than 1. From (9), it immediately follows that

$$\bar{y}^* = \varphi \bar{y} \tag{10}$$

which shows that our proposed OI is the product of EIO and the average level of opportunities available to the population.

To achieve inclusive growth, we need to increase $\bar{y}^*$, which can be accomplished by: (i) increasing the average level of opportunities $\bar{y}$, (ii) increasing the equity index of opportunities φ, or (iii) both (i) and (ii). To understand the dynamics of inclusive growth, we differentiate (10) both sides to obtain:

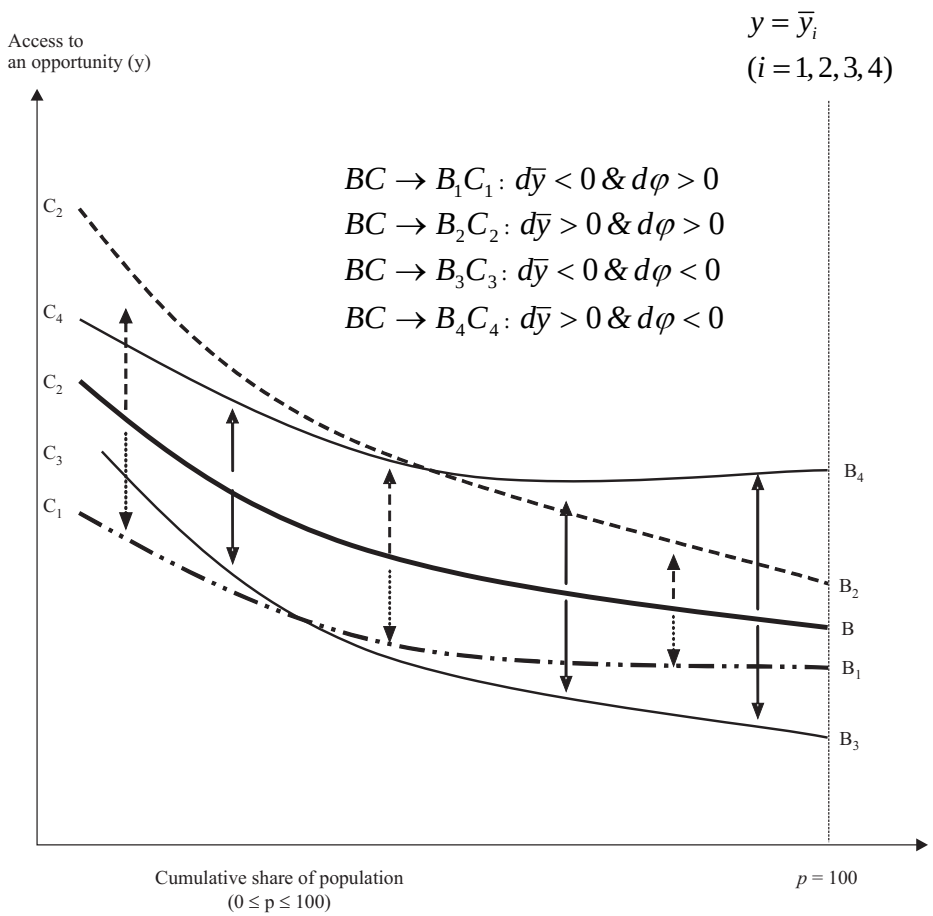
$$d\bar{y}^* = \varphi d\bar{y} + \bar{y} d\varphi \tag{11}$$

where $d\bar{y}^*$ measures the change in the degree of growth inclusiveness. Growth becomes more inclusive if $d\bar{y}^* > 0$. The first term in the right side of equation (11) is the contribution to inclusiveness of growth by increasing the average opportunity in society when the relative distribution of the opportunity does not change; the second term of the equation shows the contribution of changes in the distribution when the average opportunity does not change.

The two contributions carry important policy implications: they tell us how government policies or development strategies can influence the inclusiveness of growth. Consider a case where the second term of the right side in equation (11) is larger than the first term. In this case, a development strategy is focused on creating opportunities for the poor, rather than on expanding the average opportunities for all. There could be a trade-off between $\bar{y}$ and φ, which will be evident from the first and second terms of the equation: if $\bar{y}$ is increased, φ may decrease and vice versa. If the first term is positive but the second term is negative, higher average opportunity for the society as a whole is achieved at the expense of reducing equitable access to opportunity: in Figure 2, this case can be illustrated by the shift of the opportunity curves from BC to B_4C_4. Similarly, if

the first term is negative but the second term is positive, then the equity objective is achieved at the cost of the foregone average opportunity for the society: in Figure 2, this case can be illustrated by the shift of the opportunity curves from BC to B_1C_1. The inclusiveness of growth will depend on which contribution outweighs the other. It should be noted that there will not always be a trade-off between $\bar{y}$ and φ: one can increase (or decease) concurrently with the other. If both terms are positive ($d\bar{y} > 0$ and $d\phi > 0$), growth will always be inclusive; similarly, if both terms are negative ($d\bar{y} < 0$ and $d\phi < 0$), growth will not be inclusive.

Figure 2. **Shifts in the Opportunity Curves**



In addition, it will be interesting to investigate if one unit of increase in the average opportunity $\bar{y}$ will result in more than one unit of increase in the degree

of growth inclusiveness, when the initial value of φ is greater than 1 (i.e., opportunity is equitably distributed in favor of the poor). Thus, the initial distribution of opportunity plays an important role in determining inclusive growth: the more equitable the initial distribution, the greater the impact will be on the growth inclusiveness by expanding the average opportunity for all. Similarly, the initial level of $\bar{y}$ can also enhance the impact of equity on growth inclusiveness. These findings, therefore, suggest that both $\bar{y}$ and ϕ are important policy instruments that reinforce each other in achieving more inclusive growth.

III. EMPIRICAL ILLUSTRATION

The proposed methodology outlined in Section II is applied to the Philippines. For this purpose, we have used the Annual Poverty Indicator Survey conducted in 1998 and 2004, obtained from the National Statistics Office in Manila. The APIS is a nationwide survey designed to provide poverty indicators at the province level. This household survey is micro unit recorded. The data requirement for the proposed methodology is micro unit record household surveys for an individual country.

APIS gathers information on various aspects of well-being for all of the Philippines' 78 provinces, including the cities and municipalities of Metro Manila. It provides detailed information on demographic and economic characteristics; health status and education of family members; awareness and use of family planning methods; housing, water, and sanitation conditions of families; availability of credit to finance family business or enterprise; and family income and expenditures. The 1998 and 2004 APIS collected these information from more than 38,000 households and 190,000 individuals across the Philippines.

In terms of the social opportunity function, inclusive growth can be measured by two approaches, namely partial and full. The partial approach is derived based on a curve called the "opportunity curve." The full approach is based on an index quantified from the area under the opportunity curve.

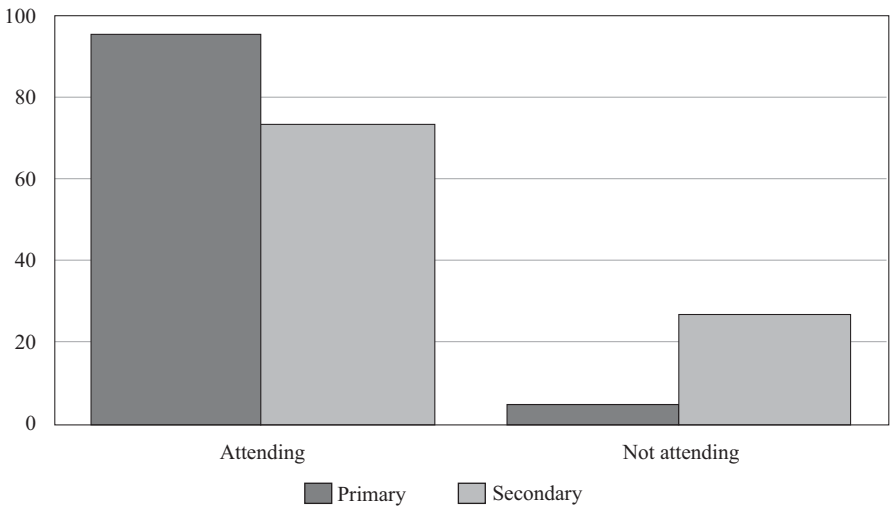
The slope of the opportunity curve may be helpful in examining the extent to which opportunities are distributed equitably or inequitably among the people at a given point in time. As discussed earlier, if the opportunity curve slopes downward, it suggests that opportunities are distributed equitably among the population. Conversely, an upward sloping curve suggests inequitable distribution of opportunities among the people. Using these technical tools, this paper will focus on assessing: (i) access to and equity of educational and health services in the Philippines, and (ii) how this access and equity of such services has changed over time.

A. Access to and Equity of Education

Education is known to promote social mobility and therefore improve equity. This is often cited as a justification for public intervention in the education sector. There are two dimensions by which one can measure whether the education system is indeed serving this end. One is through average access to education by school-age children over time and across space. The other is through distribution of educational opportunities across different socioeconomic and income groups. This section deals with both average access to and equity of education at the primary and secondary levels.

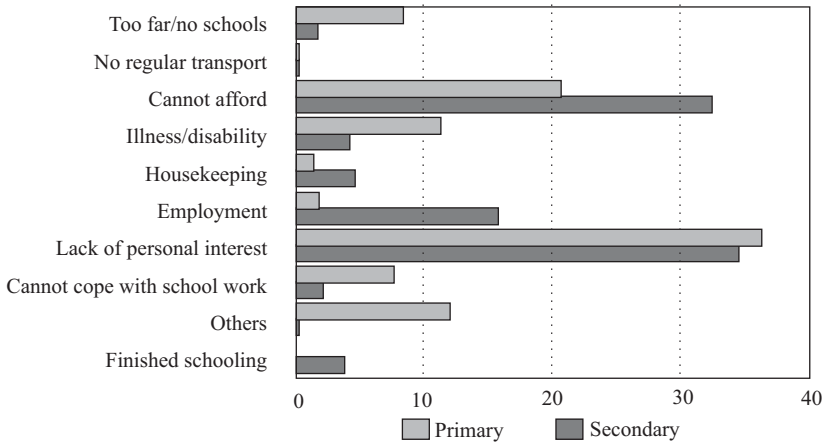
Figure 3 shows that the Philippine primary education system provides impressively wide access to children aged between 7 and 12 years. Almost 96 percent of school-age children attended primary school in 2004. However, the proportion of school attendance by children aged 13–16 years drops at the secondary level (i.e., 73 percent as shown in Figure 3). This stems from the lack of personal interest (35 percent), affordability (32 percent), and employment (16 percent) as illustrated in Figure 4. At the primary level, the main reason for not attending school is lack of personal interest. The lack of interest results in turn, from a number of factors that discourage students to study, including inadequate curriculum, unqualified teachers, and lack of learning materials. Such factors are largely related to the quality of education.

Figure 3. **Proportion of Children Currently Attending Primary and Secondary Schools, 2004**



Source: Authors' calculations based on the 2004 APIS.

Figure 4. **Reasons for Not Attending School**



Source: Authors' calculations based on the 2004 APIS.

Nevertheless, there is little direct evidence—using household survey data and school data—in the Philippines on the impact of improved school quality on school enrollments. There is, however, convincing evidence of its impact on learning outcomes. A report by the World Bank (2001) uses provincial data to show that some school staffing characteristics—particularly related to teachers—can affect elementary school completion rates. This report also suggests that there are provincial imbalances in school staffing characteristics that are correlated with provincial income.

In the Philippines, regional differences in school attendance exist in both the primary and secondary levels. This is shown in Table 1. While the regional gap is smaller for primary education, the gap is larger at secondary level. These results reveal a degree of correlation between children's school attendance and poverty across regions in the Philippines. Indeed, poor regions—such as Bicol, the Visayas, and Mindanao regions (particularly the Autonomous Region of Muslim Mindanao)—tend to have lower school attendance by children, which falls below the national average. On the other hand, richer regions like National Capital Region (NCR) and Cordillera Administrative Region exhibit the best performance on this account.

All in all, educational attainment in the Philippines has almost achieved universal access at the primary level, but remains far behind at the secondary level. Like income level, the disparity in access to primary and secondary education is quite large across regions within the country. This suggests that there is scope for improving the provision of primary and secondary education to regions that are lagging behind.

Table 1. **Percentage of School-age Children Attending Primary and Secondary Schools, 2004**

Regions	Primary	Secondary
Ilocos	98.0	77.6
Caragan Valley	96.5	74.1
Central Luzon	97.7	71.6
Southern Luzon	96.7	75.4
Bicol	95.6	73.4
Western Visayas	95.4	74.3
Central Visayas	95.2	70.8
Eastern Visayas	95.8	68.7
Western Mindanao	93.1	63.9
Northern Mindanao	96.1	72.8
Southern Mindanao	94.4	70.0
Central Mindanao	90.7	68.2
National Capital Region	97.4	82.0
Cordillera Administrative Region	97.5	79.9
Autonomous Region of Muslim Mindanao	86.4	61.9
CARAGA	96.7	74.9
Philippines	96.5	74.8

Note: CARAGA, or Region XIII, is the newest region and includes Agusan del Norte, Butuan City, Agusan del Sur, Surigao del Norte, Surigao City, and Surigao del Sur.
Source: Authors' calculations based on the 2004 APIS.

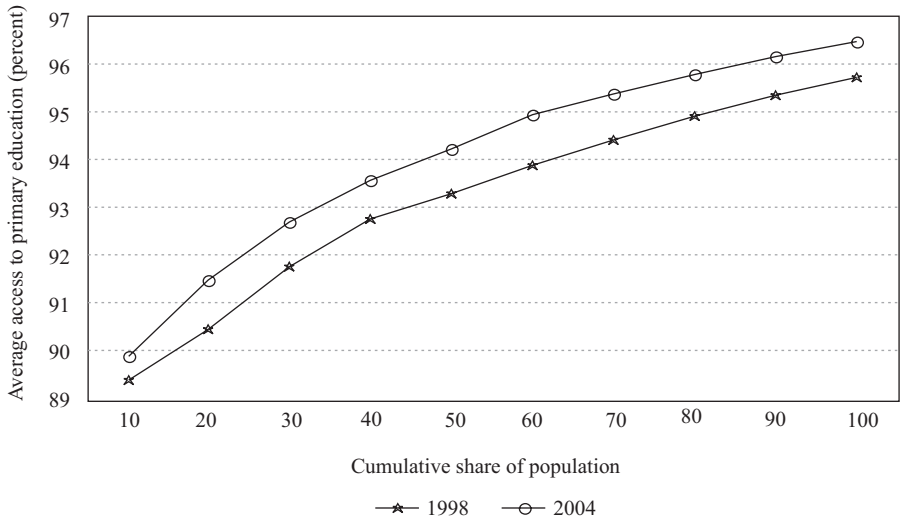
Moreover, some studies argue that there are pronounced differences in access to education between different income groups. For instance, a study by Balisacan (1994) suggests that while there is almost 100% enrollment rate for children aged 7–10 years, the figure drops beyond that age, particularly for the three poorest deciles. More recently, Manasan (2001) has found that the poor have much lower access to education compared to the nonpoor, and the disparity becomes greater at the higher educational level.

Figures 5 and 6 present the opportunity curves over the period 1998–2004. In this case, the opportunities are evaluated in terms of access to primary and secondary education. There are two points to consider on these curves. First, when the entire population is covered (i.e., a variable in the horizontal axis is 100), the opportunity curve coincides with the average access to primary (or secondary) education among children aged 7–12 years (or 13–16 years). Hence, access to primary education by the 7–12 year-old children was on average 95.7 percent in 1998, which increased slightly to 96.5 percent in 2004. Similarly, 73.4 percent of the children aged between 13 and 16 years attended a secondary school in the Philippines in 1998; and its corresponding figure was slightly higher at 74.8 percent in 2004. These results can be seen from the upward shift in the

opportunity curve. Yet, such changes in both educational levels are quite small over a 6-year period, particularly for the secondary level.

Second, in terms of the equity of access to education, children at the bottom end of the income distribution have lower access to primary and secondary education. Such inequity can be seen from the shape of the opportunity curves for both educational levels, which shows an upward slope.

Figure 5. **Opportunity Curves for Access to Primary Education, 1998–2004**



Source: Authors' calculations based on the 1998 and 2004 APIS.

It is clear from Figure 5 that the average opportunity in primary education has expanded over the period 1998–2004 among children aged 7–12 years (i.e., $d\bar{y} > 0$ in equation (11)). However, it is difficult to assess how equity in primary education has changed over time, because the opportunity curve seems to have shifted parallel across the income distribution. In such case, we need to estimate the EIO to evaluate the change in the equity of the opportunity over time (i.e., $d\varphi$). Table 2 shows that the values of EIO have remained below 1 and been almost unchanged over 1998–2004: more precisely, the EIO increased slightly from 0.974 in 1998 to 0.975 in 2004 (i.e., $d\varphi > 0$ from equation (11)).

Figure 6 clearly depicts an expansion of the average opportunity in secondary education, available among the children aged 13–16 years between 1998 and 2004 (i.e., $d\bar{y} > 0$ in equation (11)). From Figure 6, the shift in the opportunity curve is greater for households with higher income than those with lower income. This suggests $d\varphi < 0$, meaning that secondary education has been utilized increasingly more by children from richer households than from

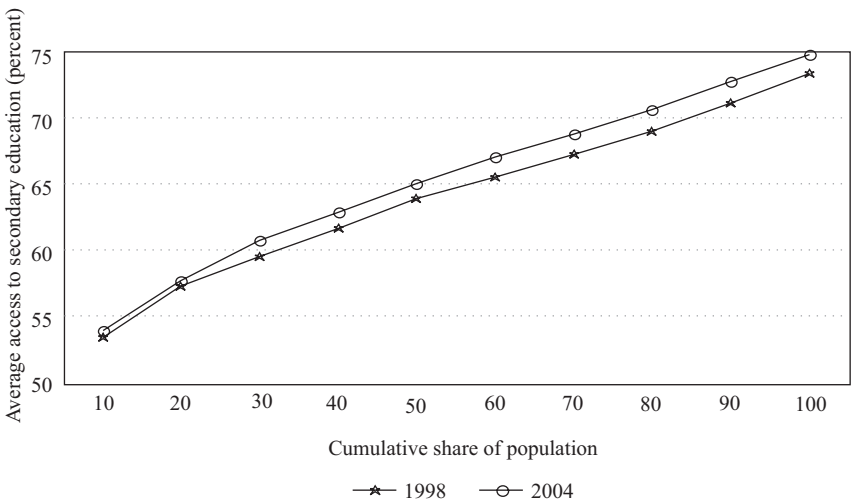
poorer ones. This result is also supported by a slight drop in the value of EIO from 0.876 in 1998 to 0.875 in 2004. The foregoing illustrates how tools such as the opportunity curve and the EIO can play a critical role in the dynamic analysis of inclusive growth.

Table 2. **Opportunity Index for Access to Primary and Secondary Education, 1998–2004**

Population Share	Primary		Secondary	
	1998	2004	1998	2004
10	89.39	89.88	53.44	53.93
20	90.45	91.49	57.29	57.74
30	91.78	92.71	59.57	60.78
40	92.76	93.57	61.73	62.94
50	93.31	94.24	63.93	65.06
60	93.90	94.96	65.59	67.06
70	94.42	95.39	67.33	68.78
80	94.91	95.80	69.03	70.66
90	95.36	96.16	71.22	72.83
100	95.75	96.49	73.44	74.82
Opportunity index	93.20	94.07	64.26	65.46
Equity index of opportunity	0.97	0.97	0.87	0.87
Comments	Not equitable	Not equitable	Not equitable	Not equitable

Source: Authors' calculations based on the 1998 and 2004 APIS.

Figure 6. **Opportunity Curves for Access to Secondary Education, 1998–2004**



Source: Authors' calculations based on the 1998 and 2004 APIS.

B. Access to and Equity of Health Services

Table 3 shows access to and equity of health services in the Philippines. The results suggest that in 1998–2004, about 44 to 46 percent of sick people sought treatment in one of the available health facilities, e.g., government hospital, private hospital, private clinic, rural health unit (RHU), *barangay* health station (BHS), or other health facilities. Moreover, overall health services in the Philippines appear to be inequitable in the sense that they are largely utilized by those at the top end of the income distribution. This is depicted in the upward sloping opportunity curves in Figure 7.

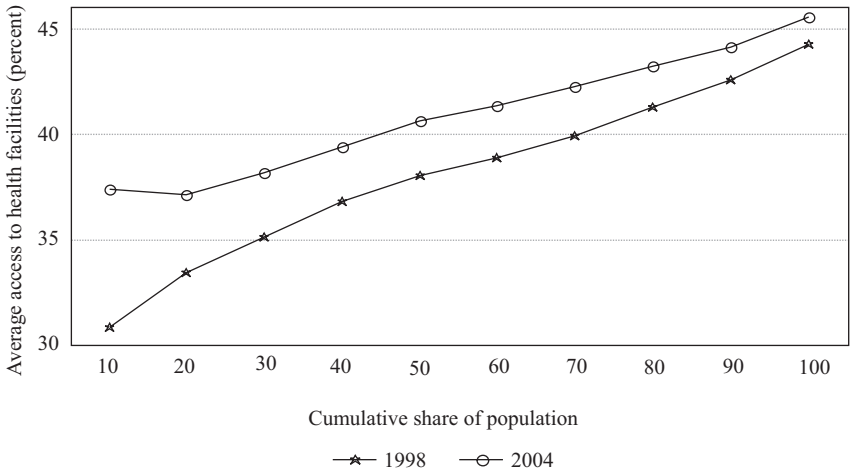
More importantly, the proportion of sick people who sought treatment in a health facility declined over 1998–2004, as seen from the downward shift of the opportunity curve between the two periods (i.e., $d\overline{y} < 0$ from equation (11)). What is worse, the shift is far greater at the bottom end of the income distribution: the gap between the two curves narrows down as we move toward the top end of the distribution. This implies that the provision of health services has become more inequitable between 1998 and 2004 (i.e., $d\varphi < 0$ from equation (11)). This is indeed confirmed by the drop in the value of the EIO from 0.90 in 1998 to 0.86 in 2004, as shown in Table 3.

Table 3. **Opportunity Index for Having Access to Health Facilities among Ill/Sick People, 1998–2004**

Population Share	1998	2004
10	37.38	30.80
20	37.14	33.39
30	38.19	35.07
40	39.37	36.81
50	40.60	38.06
60	41.38	38.86
70	42.27	39.89
80	43.23	41.27
90	44.15	42.62
100	45.60	44.31
Opportunity index	40.93	38.11
Equity index of opportunity	0.90	0.86
Comments	Not equitable	Not equitable

Source: Authors' calculations based on the 1998 and 2004 APIS.

Figure 7. **Opportunity Curve for Having Access to Health Facilities, 1998–2004**



Source: Authors' calculations based on the 1998 and 2004 APIS.

Tables 4 and 5 show different types of health facilities utilized by sick individuals during 1998–2004. Services provided by government hospitals, private clinics, RHUs, and BHSs are highly utilized by sick individuals from different income groups. But the quality of health services is expected to differ vastly among these facilities. A health facility that provides a better quality of service is likely to be utilized mainly by rich individuals. Such a health facility is expected to show an opportunity curve that slopes upward steeply.

Clearly, health services provided by private clinics tend to be highly inequitable and have become more so over 1998–2004. This is shown in Table 4. This suggests that private clinics are heavily utilized by the richer segments of the society. A similar result emerges with private hospitals. As Figure 8 suggests, access to private hospitals has fallen across different income groups, declining more for those at the bottom end. From equation (11), this thus suggests both $d\bar{y} < 0$ and $d\varphi < 0$. Compared to private health facilities, government hospitals tend to be utilized more by the people: in Table 4, the value of OI is far greater for government hospitals than that for private hospitals and clinics. Moreover, the value of EIO suggests that poor Filipinos often sought treatment in government hospitals than in private health facilities. Unfortunately, the quality of health care in government hospitals remain severely wanting compared to private facilities, especially in NCR. This is particularly disconcerting since a large share of the national government budget for health is spent on NCR hospitals.

Table 4. **Opportunity Index for Having Access to Hospitals and Clinics, 1998–2004**

Population Share	Government Hospital		Private Hospital		Private Clinic	
	1998	2004	1998	2004	1998	2004
10	16.64	21.24	6.51	4.80	13.50	8.95
20	18.73	23.00	6.58	5.68	14.22	10.77
30	20.19	24.86	7.02	5.98	15.07	12.46
40	20.61	25.92	7.79	6.59	16.89	13.48
50	20.95	26.68	8.30	7.03	18.38	15.12
60	21.06	27.03	8.94	7.86	19.97	16.56
70	21.23	27.03	10.27	8.86	21.55	18.60
80	21.08	27.21	11.44	10.43	23.53	20.44
90	20.86	26.93	13.26	12.10	25.06	22.61
100	20.22	26.12	15.38	14.40	27.02	25.15
Opportunity index	20.16	25.60	9.55	8.37	19.52	16.41
Equity index of opportunity	0.99	0.98	0.62	0.58	0.72	0.65
Comments	Not equitable	Not equitable	Not equitable	Not equitable	Not equitable	Not equitable

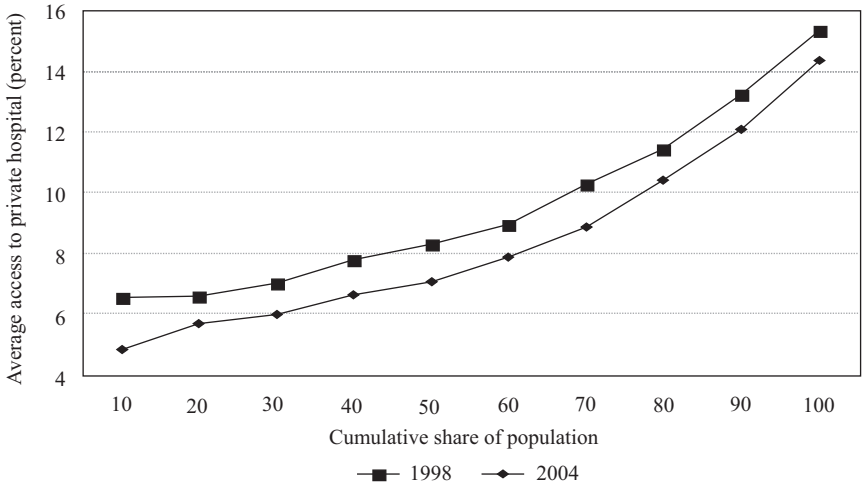
Source: Authors' calculations based on the 1998 and 2004 APIS.

Table 5. **Opportunity Index of Having Access to Rural Health Centers and *Barangay* Health Stations, 1998–2004**

Population Share	Rural Health Unit		*Barangay* Health Station	
	1998	2004	1998	2004
10	39.80	40.33	21.50	35.80
20	39.10	38.45	20.46	33.02
30	37.48	36.51	20.05	31.13
40	35.98	35.65	18.94	29.57
50	34.76	34.59	18.10	28.35
60	33.43	33.24	17.28	27.12
70	31.70	31.55	16.07	25.65
80	29.97	29.67	14.96	23.90
90	27.98	27.89	13.90	22.05
100	25.74	25.72	12.69	20.05
Opportunity index	33.59	33.36	17.39	27.66
Equity index of opportunity	1.31	1.30	1.37	1.38
Comments	Equitable	Equitable	Equitable	Equitable

Source: Authors' calculations based on the 1998 and 2004 APIS.

Figure 8. **Opportunity Curve for Having Access to Private Hospital, 1998–2004**



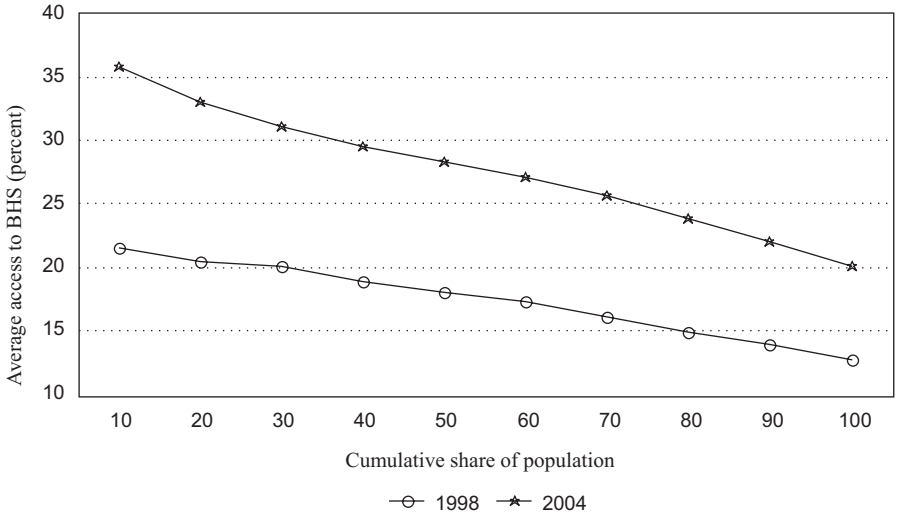
Source: Authors' calculations based on the 1998 and 2004 APIS.

Public health services are used mainly by those who cannot afford private health care. Compared to government facilities, private facilities are ranked superior on all aspects of quality, e.g., care, facility, personnel, medicine, and convenience—by the clients. Government facilities cater to the poor because of low costs of treatment, cheaper medicines and supplies, and flexibility in paying health bills.

Expectedly, health facilities such as RHUs and BHSs are utilized more by people at the lower end of the income distribution. This is evident in the downward-sloping and flat opportunity curves for BHSs, as shown in Figure 9. Moreover, the opportunity curve has shifted upward over the 1998–2004 period, with the shift being far greater at the bottom end of the distribution (i.e., $d\bar{y} > 0$ and $d\varphi > 0$ in equation (11)). This therefore suggests that poor people utilize health services provided by BHSs, as well as by RHUs.

It is generally perceived that RHUs and BHSs provide low-quality health services (World Bank 2001). Diagnosis is poor, resulting in repeat visits. Medicines and supplies are inferior and rarely available. Staff members are often absent, especially in rural areas, and are perceived to lack medical and people skills. Waiting time is long, schedules are very inconvenient, and facilities are rundown.

Figure 9. **Opportunity Curve for Having Access to BHS, 1998–2004**



Source: Authors' calculations based on the 1998 and 2004 APIS.

It is essential to note that both RHUs and BHSs are categorized as primary government facilities that can appropriately provide preventive health services and treatment for minor illnesses/accidents. Despite access to these primary facilities, however, a sizable number of Filipinos still prefer to seek treatment in government hospitals and private clinics/hospitals. Thus, government hospitals end up providing the same services as primary facilities. It is, therefore, critical to ensure that primary health services are delivered efficiently so that they can prevent the incidence of diseases such as diarrhea, bronchitis, influenza, pneumonia and tuberculosis. Preventive health care services do a lot more in the long run in protecting the people's health, and require less amounts of budgetary allocation than medical treatments.

Table 6 shows that utilization of health facilities vary across regions. Those living in the Mindanao region tend to underutilize health services during 1998–2004. In terms of health status indicators moreover, there are large differentials across regions and provinces within the country. For instance, NCR has an infant mortality rate of around 20, which is very close to the norm of developed countries, whereas there are parts of Mindanao where the mortality rates are still close to or a little over 100, similar to the least developed countries. Given that Mindanao is one of the poorest in the country, the wide gap in health status calls for an effective system of health service delivery that will reach the disadvantaged areas and regions.

Table 6. **Proportion of Sick People Having Access to Health Facilities by Regions**

Regions	Health Facilities		Public Hospital		Rural Health Units	
	1998	2004	1998	2004	1998	2004
Ilocos	41.3	52.6	20.1	29.9	28.5	30.8
Caragan Valley	49.2	53.7	23.1	33.1	23.8	29.9
Central Luzon	47.4	46.3	19.6	26.6	17.1	17.5
Southern Luzon	48.5	46.6	18.3	26.6	21.6	21.9
Bicol	48.7	39.7	19.5	24.7	21.5	25.9
Western Visayas	38.3	36.2	22.8	24.3	23.6	28.5
Central Visayas	45.0	52.3	16.1	21.8	39.2	24.6
Eastern Visayas	40.4	41.2	31.6	30.1	25.1	36.6
Western Mindanao	37.1	24.9	20.6	35.0	30.9	33.3
Northern Mindanao	42.0	36.9	17.9	26.3	28.8	22.0
Southern Mindanao	44.3	38.6	13.4	19.6	16.1	13.9
Central Mindanao	34.9	40.9	17.5	15.1	31.9	23.3
NCR	55.5	54.6	20.2	26.3	22.2	22.6
CAR	52.2	57.8	24.1	35.1	25.7	18.4
ARMM	48.7	37.4	22.6	35.7	41.6	43.4
CARAGA	36.1	39.4	24.4	27.6	36.8	27.6

Note: NCR means National Capital Region, CAR means Cordillera Administrative Region, and ARMM means Autonomous Region of Muslim Mindanao. CARAGA, or Region XIII, is the newest region and includes Agusan del Norte, Butuan City, Agusan del Sur, Surigao del Norte, Surigao City, and Surigao del Sur.
Source: Authors' calculations based on the 1998 and 2004 APIS.

IV. CONCLUSIONS

This paper introduces a new approach to measuring inclusive growth. Similar to the idea of a social welfare function, the paper has introduced the idea of a social opportunity function. Growth is defined as inclusive if it increases the social opportunity function, which depends on two factors: (i) average opportunities available to the population and (ii) how opportunities are distributed in the population. This idea has been made operational by means of the opportunity curve, which has a one-to-one relationship with the social opportunity function: the higher the opportunity curve, the greater will be the social opportunity function. The opportunity curve can be empirically calculated using unit record household surveys. Empirical applications to the Philippines presented in the paper show that the opportunity curve is a useful device to analyze the inclusiveness of growth in quantitative terms.

But a more relevant issue is the assessment of how the opportunities change over time. This type of dynamic analysis can be done by examining how the opportunity curves shift between two periods. For instance, if the entire

opportunity curve shifts upward, this suggests that growth is inclusive: growth is not only increasing the average opportunities available to the whole population, but is also increasing the opportunities for the poor that belong to the bottom of the income distribution. The degree of inclusiveness will depend on (i) how much the curve shifts upward and (ii) in which part of the income distribution the shift takes place. This dynamic analysis will also allow for monitoring the inclusiveness of growth over time for an individual country.

For empirical analysis, the paper looked at the case of the Philippines. The proposed methodologies have brought out various aspects of the Philippine public service deliveries in health and education. The methodologies were not only useful in assessing the average access to the public services available to the people, but also in evaluating the equity of access to such services across different income groups. More importantly, the study had demonstrated that while the analysis could be done at a point in time, dynamic analysis was also possible to assess the changes in the access and equity of opportunities. From a policy perspective, the results revealed the urgency to tailor public health and education services that will cater to the needs of the disadvantaged groups (or regions) in the country. But beyond health and education, our methodologies can be a useful tool for the government to draw policies that can channel its resources to the needy, thereby significantly contributing to its efforts to reduce poverty.

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