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Defining and Measuring Inclusive Growth: Application to the Philippines

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JULY 2007

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FOREWORD

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ABSTRACT

This study proposes an approach to defining and measuring inclusive growth using a new methodology to capture inclusive growth. In this context, the paper introduces the idea of a social opportunity function that is similar to a social welfare function. In this study, 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. This idea is made operational by means of the 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. The proposed methodologies are applied to the Philippines using its micro unit record household survey. Empirical applications analyze access to and equity of such opportunities as employment (total and also by gender); education; health; and basic infrastructure such as electricity, clean drinking water, and sanitation.

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% of a growing population (ADB 2005). 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 of 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. Hence, reducing inequality has become a major concern of development policy, a concern that has generated interest in inclusive growth. While there remains no consensus on how to define or measure inclusive growth, the issue has generated a certain amount of policy and academic debate.

The objective of this paper is to provide an approach to defining and measuring inclusive growth. The study proposes a new methodology to capture inclusive growth, based on a social opportunity function similar to the idea of a social welfare function. The paper is organized in the following manner. Section II is devoted to defining inclusive growth, outcomes of inclusive growth, and key measures to achieve such outcomes. Detailed discussions on key measures are presented in Section III. While Section IV sets out the analytical framework describing the methodology, Section V provides discussion of the empirical results. For the empirical study, we have used the Philippines's Annual Poverty Indicator Survey (APIS) conducted in 1998. Finally, Section VI concludes the study.

II. DEFINING INCLUSIVE GROWTH

Very recently, the report of the Eminent Persons Group that was initiated by ADB (2007) 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.¹ The growth process creates new economic opportunities that are unevenly distributed. The poor are generally constrained by circumstances or market failures that disable them to avail of 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 in the new economic opportunities of those less well off. 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

¹ See also Ali and Zhuang (2007) where inclusive growth as a development goal emphasizes both the creation of and equal access to opportunities for all, not just for the poor.

created for all segments of society. Growth is inclusive when it allows all members of a society to participate in, and contribute to, the growth process on an equal basis regardless of their individual circumstances.

The ultimate outcomes of inclusive growth are (i) sustainable and equitable growth, (ii) social inclusion, (iii) empowerment, and (iv) security. Economic growth is indeed an essential requirement for inclusive growth. For growth to be rapid and sustained, it should be broad-based across sectors and regions, and inclusive of the large part of the labor force, including the poor and vulnerable groups of the population. Social inclusion is the removal of institutional barriers and the enhancement of incentives to increase the access of all segments of the society to development opportunities. Empowerment is the enhancement of the assets and capabilities of diverse individuals and groups to function in and to participate in the growth process. Security encompasses improved management of the social risks arising out of development interventions.

There can be many measures that are required to achieve outcomes of inclusive growth. This paper is particularly concerned with three key measures.

One key measure is related to providing job opportunities and promoting productivity. The Eminent Persons Group report argues that inclusive growth continues to emphasize the importance of economic growth. Rapid economic growth can benefit all segments of society including the poor. Indeed, a rise in growth rate potentially creates more job opportunities and may also improve labor productivity, hence raising individual's income on average. Economic growth also benefits the poor: it provides them with productive job opportunities and generates more government revenues for programs to help the poor. In recent years, much attention has been given to the "jobless growth" phenomenon in many parts of the world economy (e.g., India), where while the growth in gross domestic product (GDP) is impressive, its effect on employment creation is rather sluggish. Similarly, falling labor productivity with rising employment growth has also attracted much debate in some economies such as the Philippines. Hence, creating job opportunities and improving productivity are indeed pertinent to achieving the outcomes of inclusive growth such as sustainable and equitable growth and social inclusion. Moreover, promoting social inclusion also requires the removal of institutional barriers that are constraints to economic growth. Even when the state functions well, its policies and practices may block or discourage development opportunities for the people, particularly for the poor. In some societies, the borders between the formal and informal economy may be further reinforced by considerations of ethnicity or gender, thereby imposing additional barriers to opportunity and to the equitable distribution of the benefits of growth.

Another key measure involves strengthening capabilities in the form of human or social capital. People's capabilities are as important as their assets. Capability allows persons to function, to exercise their freedom to convert their entitlements, in the form of command over goods and services (i.e., assets), into well-being. From this perspective, economic development is not a matter of expanding supplies of commodities, but of enhancing the capabilities of people (Sen 1985). To develop human capabilities, emphasis should be on investing directly in public provision of basic social services in education, health, and infrastructure. Improving education and health services and providing basic infrastructure services are critical for both sustainable growth and development in human capabilities. The two-way causation between the two parameters will be discussed in the next section.

A third key measure is providing social safety nets and targeted interventions. There could be various types of social risks that could arise in the process of economic development. A common example of social risks could be vulnerability risk or increased exposure to endemic risks or external shocks.² Such social risks are likely to affect outcomes of economic development. In particular, the poor lack the means to manage social risks and to cope with external shocks. Hence, there should be risk management measures—such as social safety nets and targeted intervention to the poor—that need to be taken into account in achieving the outcomes of inclusive growth.

Finally and more fundamentally, these three key measures cannot be addressed unless institutional and governance issues are embedded in inclusive growth.³ In other words, *institutional and governance issues* should be considered as the foundation to make progress on the three key measures and hence to achieve the outcomes of inclusive growth. The problem of deprivation is much deeper than the mere shortage of economic and financial resources. Inclusive growth has a strong interface with law and development, particularly when it comes to ensuring access to justice for the poor and vulnerable. According to Wolfensohn and Bourguignon (2004), a prime challenge for developing countries is further progress to build capacity, fight corruption, improve the investment climate, and empower the whole population. In addition, stronger representation and rule of law or legal institutions, which are inclusive and accessible to the poor, are imperative to guarantee the rights of participation, especially for those most likely to be excluded.

III. KEY ELEMENTS IN INCLUSIVE GROWTH

As discussed in the previous section, there are three key measures that play a critical role in achieving the outcomes of inclusive growth: (i) creating employment opportunities and promoting higher productivity, (ii) developing human capabilities through adequate investment in basic social services of education and health, and (iii) providing social safety nets and targeted interventions to help those who are vulnerable and/or suffer from extreme deprivation. These three measures will be discussed in turn.

A. Employment and Productivity

The *World Employment Report 2004-05* (ILO 2004) deals with the twin issues of creating employment opportunities and promoting higher productivity in order for countries to improve the standards of living of their citizens and obtain long-term sustainable growth. Indeed, achieving inclusive growth requires both the creation of full employment and productive employment, distinguishing between the creation of low-quality jobs and decent-quality jobs.

Increasing productivity and employment for long-run sustainable growth requires a twin strategy of investing in dynamically growing sectors while at the same time building capacity in sectors where the majority of labor is employed. Investing only in the dynamic sectors may suffice to accelerate growth, albeit this may not be inclusive for all—particularly the poor—mainly because

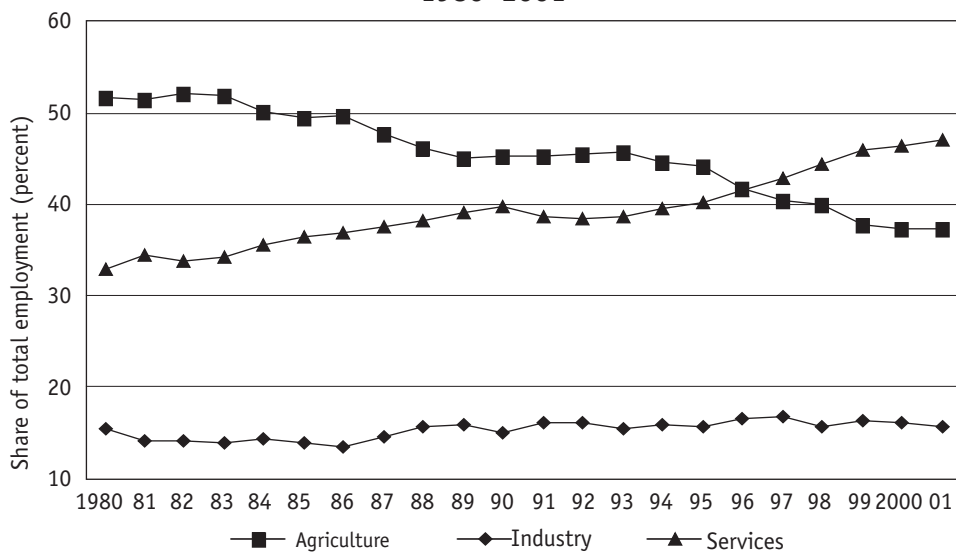
² Other types of social risks might include country risks (e.g., political instability, ethnic or religious tensions, violent conflict, militarization of society); political economy and institutional risks (e.g., weak governance and limited administrative capacity); and exogenous risks (e.g., regional conflict, macroeconomic changes, climate change).

³ Ali (2007) argues that the core requirement of inclusive growth is leveling the economic and political playing field so that everyone in society can participate in, contribute to, and benefit from the new opportunities. He goes on to argue that fundamental institutional and governance reforms aimed at addressing market, policy, and institutional failures would be required to achieve inclusive growth.

the fastest growing sectors may often not be where the majority of the vulnerable or poor are employed, and may require skills and training that these people are unlikely to possess. India is a case in point. Currently India's information technology sector employs about 800,000 people, a figure that is expected to rise to 2 million by 2008 (*The Economist 2004*). However job growth in the rest of India's economy has not been sufficient to provide adequate employment opportunities for the over 400 million people who make up the labor force, two-thirds of whom are located in the rural sector and who lack the education and skills to compete for these information technology jobs. The challenge then is to broaden the dynamic sectors of the economy, while deepening their linkages with other sectors in the economy where majority of labor is employed.

As illustrated for the Philippines in Figure 1 and Table 1, a considerable shift has been taking place away from agriculture toward the nonagricultural sectors of the economy, i.e., industry and services. This trend is likely to continue to 2010 and 2020. It is imperative thus to equip workers with skills and training so that they can be absorbed in these growing areas of the economy, a strategy that is tantamount to increasing their productivity.

FIGURE 1
CHANGES IN THE SHARE OF TOTAL EMPLOYMENT BY SECTOR IN THE PHILIPPINES,
1980–2001



Source: Authors' calculations based on the *World Development Indicators 2006*.

TABLE 1
SECTORAL DISTRIBUTION OF EMPLOYMENT IN THE PHILIPPINES, 1980–2020

	PERCENTAGE SHARE OF TOTAL EMPLOYMENT			
	AGRICULTURE	INDUSTRY	SERVICES	TOTAL
1980	51.80	15.40	32.80	100.00
2001	37.40	15.60	47.00	100.00
Projected in 2010	33.02	17.55	49.43	100.00
Projected in 2020	28.09	18.88	53.03	100.00

Source: Authors' estimation based on *Key Indicators of the Labour Market 2006* (ILO 2006).

This strategy will have the largest impact on workers' lives not only in the short and medium run, but also in the long term. In the interim, it will provide workers with decent employment opportunities, defined by security, opportunities, basic workers' rights, and representation. In the long run, workers will be equipped with the necessary skills and training to compete for job opportunities in a dynamic economy.

Of the many economic indicators, elasticity of employment with respect to growth is useful in analyzing structural changes in employment over time. Employment–growth elasticity estimates the percentage change in the number of employed persons associated with a percentage change in output, measured by GDP. Table 2 shows that in the Philippines, a 1 percentage point increase in GDP was associated with a decrease in agricultural employment of 0.63 percentage point, an increase in industrial employment of 0.07 percentage point, and an increase in services employment of 0.73 percentage point.⁴ These figures are indicative of an ongoing structural change toward a larger share of the industry and service sectors in the Philippine economy.

TABLE 2
EMPLOYMENT–GROWTH ELASTICITY BY SECTOR IN THE PHILIPPINES

	TOTAL	AGRICULTURE	INDUSTRY	SERVICES
1980–1989	0.27	-0.75	-0.07	1.09
1990–2001	0.10	-0.57	0.14	0.53
1980–2001	0.16	-0.63	0.07	0.73

Source: Authors' estimation based on the *World Development Indicators 2006*.

As illustrated in the case of the Philippines, the shift in employment toward services would be expected as an economy becomes more developed (i.e., moves toward high income).⁵ Labor

⁴ Kahn (2001) argues that employment elasticities in developing countries should ideally be around 0.7 until these countries become upper-middle-income status. He demonstrates that employment elasticities gradually decline as a country becomes more developed and more labor-scarce. Kahn argues that labor-abundant economies, and especially those with a relatively high incidence of poverty, need to achieve relatively higher employment intensity than do less labor-abundant economies.

⁵ Kapsos (2006) finds that at the global level, the elasticity of services employment to GDP was nearly three times as large as the corresponding figures for agriculture and industry during 1991–2003.

absorption by the services sector is a very diverse process. Economic growth in general implies the increasing contribution of services in response to an increased demand for finance, trade, transport, communication, and social services. This service–employment growth effect can be considered partly as a classic type of economic development based on the integration of markets, the increase of scale-enhancing specialization, and the division of labor. As a result, many service activities have become independent activities, outsourced from agriculture and, to an even larger extent, the industrial sector in which they were once embedded.

Moreover, employment growth in the service sector can be a residual, i.e., stemming from a lack of productivity growth in the rest of the economy. In particular, demographic pressures in rural areas that lack sufficient employment opportunities have caused large flows of rural–urban migration. These migrants are mostly absorbed by the urban informal sector (ADB 2007). In particular, the service sector is much more able to absorb hidden unemployment than the industrial sector, because of the possibilities of small-scale production and less capital-intensive work.

Along with the number of jobs created in the growth process, it is equally important to look into the quality of jobs or the creation of productive jobs. It is often claimed that there is a strong link between productivity and decent work, or work that provides a sufficient level of income but also ensures social security, good working conditions, and a voice at work. In this respect, the concept of “working poor” in the developing world adds a new dimension to the study of labor markets by placing decent and productive employment at the forefront of the poverty discussion.

The fundamental reason for addressing these issues is based on the simple observation that a substantial share of poor people in the world is already at work. In other words, it is not the absence of economic activity that is the source of their poverty, but the less productive nature of that activity. In purely empirical terms, the link between work of low productivity and poverty is starkly clear. A proposition is that if the 555 million people working in poverty were able to earn more from their work, then poverty would decline (ILO 2004). But it is not just any work that can raise people out of poverty. Rather what is needed is productive work. Hence a key element of achieving an effective inclusive growth strategy is whether men and women can earn enough from their work to lift themselves and their families out of poverty.

Table 3 shows historical and forecasts of the share of employed persons earning below the \$1-a-day and \$2-a-day poverty line for the Philippines. The forecasts reveal that there will still be a significant proportion of working poor in the Philippines in 2020, when the working poor are defined as those earning less than \$2-a-day.

TABLE 3
PERCENTAGE OF WORKING POOR IN TOTAL EMPLOYMENT, PHILIPPINES

	SHARE OF WORKING POOR IN TOTAL EMPLOYMENT (PERCENT)	
	AT \$1-A-DAY	AT \$2-A-DAY
1991	26.60	77.00
2000	21.10	67.30
Projected in 2010	14.28	52.58
Projected in 2020	10.39	43.29

Source: Authors' estimation based on *Key Indicators of the Labour Market 2006* (ILO 2006).

In general, the main reason why productivity growth impacts poverty is because productivity is the main determinant of income growth. Gains in productivity mean that there is more real income in the economy that can be distributed to workers in the form of increased wages. In developing countries, it is not only employment that is necessary for poverty reduction, but also productive employment that leads to increased wages, allowing workers to rise above the poverty threshold.

It is also important to note productive growth and poverty reduction can move in a virtuous circle. Productivity growth raises incomes and reduces poverty. In turn, the reduction in poverty can lead to improved productivity as those that move from poor to nonpoor status enjoy better health and acquire more education. Both these developments enhance productivity growth.

B. Development in Human Capabilities

According to the United Nations Development Programme (UNDP 1990), human development is defined as a process of enlarging people's choices. Human development is increasingly viewed as the ultimate objective of development beyond economic growth. The importance of human development is even greater in the context of inclusive growth. The link between human development and inclusive growth remains critical as economic growth is foremost to sustain progress in human development. Moreover, over time, human development is itself an important contributor to growth.

There is an undoubtedly strong link between growth and human development. On one hand, growth provides the resources to permit sustained improvements in human development. On the other hand, improvements in human development raise the capacities of economic agents who make the critical contributions to economic growth.

- (i) *Growth can fuel human development.* The propensity of households to spend their income on items that contribute most directly to the promotion of human development—e.g., education and health, food and potable water—varies depending upon the level and distribution of income across households, as well as on who controls the allocation of expenditure within households. In general, as the incomes of the poor rise, the proportion of income spent on human development increases (Behrman 1996). This means that higher and more equally distributed growth is likely to enhance expenditure on human development.

Government, both central and local, plays a critical role in improving human development. More specifically, the government's resources to improve human development is a function of the total public sector expenditure, how much of this expenditure flows to human development sectors, and the allocation within these sectors.⁶ Those expenditures that are clearly much more productive than others in terms of achieving advances in human development are defined as priorities. For example, basic education, especially at an early stage of development, is generally recognized to have a larger impact on human development than tertiary education. Yet the precise definition of what constitutes a "priority" will inevitably vary according to a country's stage of development.

⁶ What is more important is the effectiveness of these expenditures in raising human development levels. For instance, there is abundant empirical evidence to show that female education can improve infant survival and nutrition (Rosenzweig and Schultz 1982). Other research has demonstrated that the provision of basic health services improve child health and increases survival significantly (Lavy et al. 1995).

- (ii) *Human development causes economic growth.* Higher levels of human development affect the economy by enhancing people's capacities and thus their productivity. Ample evidence suggests that as people become healthier, better nourished, and educated, they contribute more to economic growth through higher labor productivity, improved technology, attracting more foreign capital, and higher exports. This, of course, does not detract from the intrinsic value of improving the lives of those who cannot find employment because of disability or age, for instance.

Numerous studies indicate that increases in earnings are associated with additional years of education, with the rate of return varying with the level of education (Behrman 1995, Schultz 1993). Moreover, in agriculture, evidence suggests education positively affects the productivity among farmers using modern technologies (Schultz 1975, Rosenzweig 1995). In Thailand, farmers with four or more years of schooling were three times more likely to adopt fertilizer and other modern inputs than less educated farmers (Birdsall 1993).

Improved education can also favorably lead to greater income equality. As education becomes more broad-based, people with low incomes are better able to seek out economic opportunities that improve income distribution over time. In addition, improved health and nutrition have also been shown to have direct effects on labor productivity, especially among poorer individuals (Behrman 1996).

Given the strong two-way relationship between economic growth and development in human capabilities, one has to simultaneously promote both in order to sustain progress in either. Economic growth, which is important to improving human development, is itself not sustainable without enhancing the latter. Experience suggests that economic policy tends to focus priority on getting the economic fundamentals "right" as a necessary precondition for economic growth, arguing that human development improvement must await such economic growth. In contrast, the concept of inclusive growth does not support postponing improvements in human development until economic resource expansion makes it affordable. Any postponement may neglect to sustain growth itself.

C. Social Safety Nets and Targeted Intervention

In developing countries, market failures are common. Markets connect every man and woman including the poor to the growth process. When markets fail, outcomes will undermine inclusive growth in the sense that market failures prevent the poor from participating in the economy. Even if markets do not fail, the outcome may not be inclusive when the disadvantaged participate in markets through discriminatory formal or informal institutions. Under these circumstances, there is scope for government to inevitably intervene so as to provide goods and services to the disadvantaged and poor. In this respect, social safety net programs and targeted interventions to those who suffer extreme deprivation are crucial for achieving inclusive growth. Safety nets are programs that protect a person or household against two adverse outcomes: (i) chronic incapacity to work and earn (chronic poverty); and (ii) a decline in this capacity from a marginal situation that provides minimal means for survival with few reserves (transient poverty).

There are various mechanisms for protecting individuals from acute deprivation or inadvertent declines in income. In some societies, informal or community-based arrangements (private safety nets) help mitigate the adverse outcomes in welfare. In addition, publicly supported social safety nets

also help the vulnerable, which include social services (in health and education); social assistance programs (e.g., old age and disability pensions); all publicly funded transfers (e.g., cash transfers such as family allowances and in-kind transfers such as food subsidies); and income-generation programs targeted to the poor (e.g., public works programs).

More importantly, targeted assistance is necessary to reach those who still cannot make use of market opportunities because they lack assets such as knowledge and skills, capital, land, or certain basic needs. The rationale for targeting is that the social returns for a given level of transfer are higher for individuals or households at the lower end of the income distribution than at the upper end. To maximize the welfare effect of a transfer program, the appropriate target would be the population segment deemed poor according to some criteria. Hence the ability to measure poverty and identify the poor is essential for designing any targeted transfer program.

IV. METHODOLOGY

This section discusses the measurement of inclusive growth. 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 in Section II, 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, \dots, x_n , where x_1 is the poorest person and x_n is the richest. Then we define a social welfare function as

$$W = W(x_1, x_2, \dots, x_n) \quad (1)$$

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

$$O = O(y_1, y_2, \dots, y_n) \quad (2)$$

where y_i is the opportunity enjoyed by the i th 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 i th person is deprived of a certain opportunity and takes the value 100 when the i th person has that opportunity. The average opportunity for the population is then defined as

$$\bar{y} = \frac{1}{n} \sum_{i=1}^n y_i \quad (3)$$

which is the percentage of the population who enjoys a given opportunity.⁷

The opportunity function should be an increasing function of its arguments. If the opportunity of any person increases, then 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 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:

$$O(y_1 - t, y_2 + t, y_3, \dots, y_n) \leq O(y_1, y_2, y_3, \dots, y_n) \quad (4)$$

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

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

$$Q(t) \approx (y_1 - t, y_2 + t, y_3, \dots, y_n) \quad (5)$$

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:

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

which is the distribution of cumulative means of $Q(t)$ when the individuals are arranged in ascending order of their incomes. $Q^c(t)$ represents the concentration curve of the distribution $Q(t)$.⁸ Similarly, the concentration curve of the distribution $Q(0)$ is given by

$$Q^c(0) \approx \left(y_1, \frac{y_1 + y_2}{2}, \frac{y_1 + y_2 + y_3}{3}, \dots, \frac{y_1 + y_2 + \dots + y_n}{n} \right) \quad (7)$$

Comparing (6) and (7) it is evident that the concentration curve $Q^c(0)$ will always be higher than the 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 concentration curve. Similarly, we can prove that if the distribution y has a higher concentration curve than y^* , then distribution y will always give a greater social opportunity function. Thus, by looking at the concentration curves of two distributions, we can judge which of these two will provide greater social opportunities, provided the two concentration curves do not intersect.

⁷ 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 to 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.

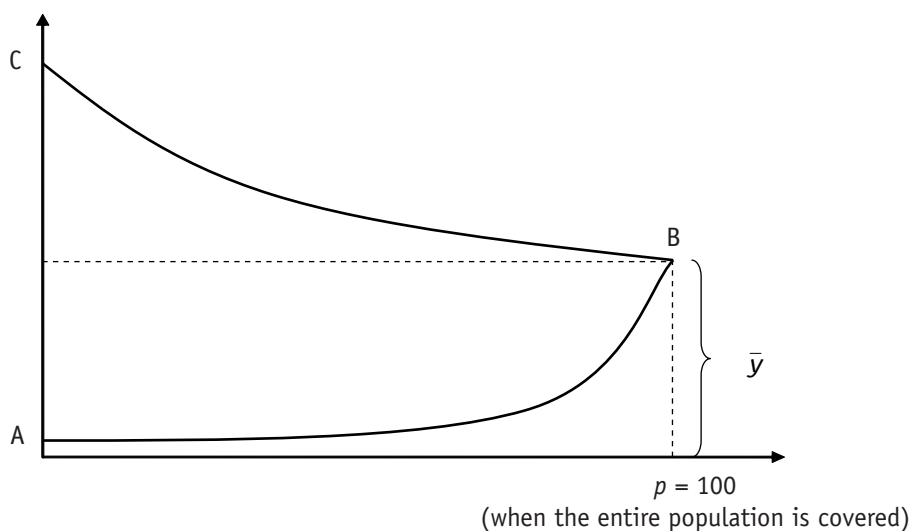
⁸ See Kakwani (1980) for detailed discussions on the concentration curve.

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 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 2 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.

FIGURE 2
OPPORTUNITY CURVES



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.

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 may be obtained by calculating an index from the area under the opportunity curve as denoted below:

$$\bar{y}^* = \int_0^1 \bar{y}_p dp \quad (8)$$

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):

$$\varphi = \frac{\bar{y}^*}{\bar{y}} \quad (9)$$

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

$$\bar{y}^* = \varphi \bar{y} \quad (10)$$

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:

$$d\bar{y}^* = \varphi d\bar{y} + \bar{y} d\varphi \quad (11)$$

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. 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. 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 decrease) 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 always be inclusive.

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 a more inclusive growth.

V. EMPIRICAL ILLUSTRATION

The proposed methodology outlined in Section IV is applied to the Philippines. For this purpose, we have used the Annual Poverty Indicator Survey (APIS) conducted in 1998 and sourced from the National Statistical Office in Manila.⁹ The APIS is a nationwide survey designed to provide poverty indicators at the province level. This household survey is micro unit recorded. Note that the data requirement for the proposed methodology is micro unit record household surveys for an individual country.

APIS gathers information on many aspects of well-being for all of the Philippines's 78 provinces, including all 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 APIS collected such detailed information from more than 38,000 households and 190,000 individuals across the Philippines.

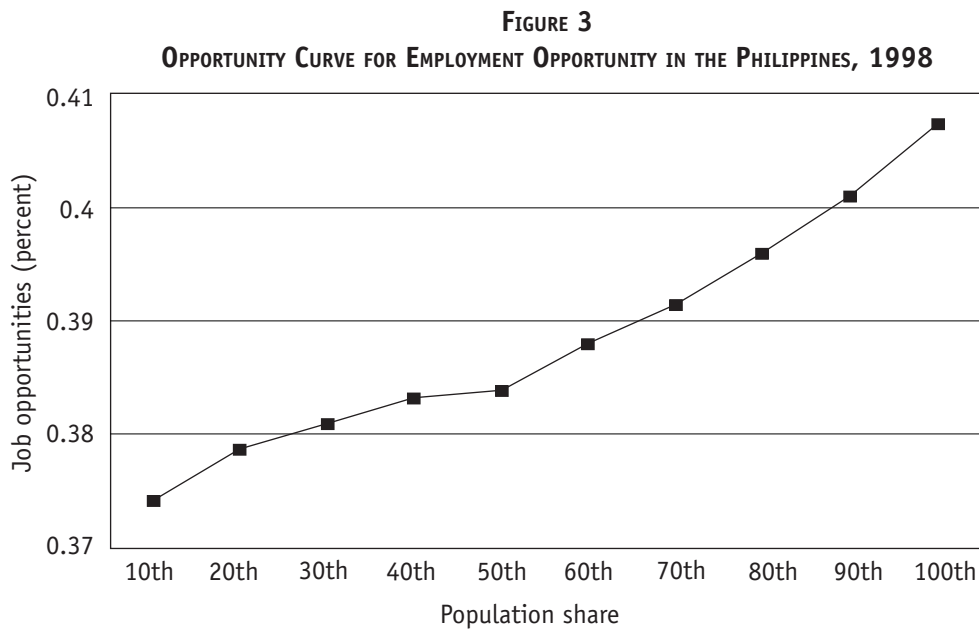
In terms of the social opportunity function, inclusive growth can be measured by two approaches, namely partial and full. The partial approach is derived based on a curve called the "opportunity curve." The full approach is based on an index quantified from the area under the opportunity curve.

The slope of the opportunity curve may be helpful in examining the extent to which opportunities are distributed equally or unequally among the people at a given point in time. As discussed earlier, if

⁹ We utilized the 1998 APIS for this study because we only had this data set for the Philippines. Yet it can also be applied to the 2002 and 2004 APIS, which will be our future research.

the opportunity curve slopes downward, then it suggests that opportunities are distributed equitably among the population. Conversely, an upward sloping curve suggests inequitable distribution of opportunities among the people.

Figure 3 shows the opportunity curve for employment opportunities available to the population in 1998. From the opportunity curve, there are two points to consider. First, when the entire population is covered ($p = 100$), the opportunity curve coincides with the average job opportunity available for the population. Hence, the average per capita job opportunity in the Philippine economy was 0.407 in 1998, or almost 41% percent of the population was employed in the economy. Second, the opportunity curve is upward-sloping. This suggests that the poor belonging to the bottom of the income distribution have less job opportunities than the nonpoor.¹⁰



Source: Authors' calculations based on the 1998 APIS.

The analysis can be extended to different socioeconomic groups, e.g., by gender, by urban/rural areas, etc. In this study, we have looked into whether there is a significant disparity in job opportunities in the Philippines between the male and female population. Results are presented in Table 4.

¹⁰ It is possible that the poor are poor because they have fewer job opportunities.

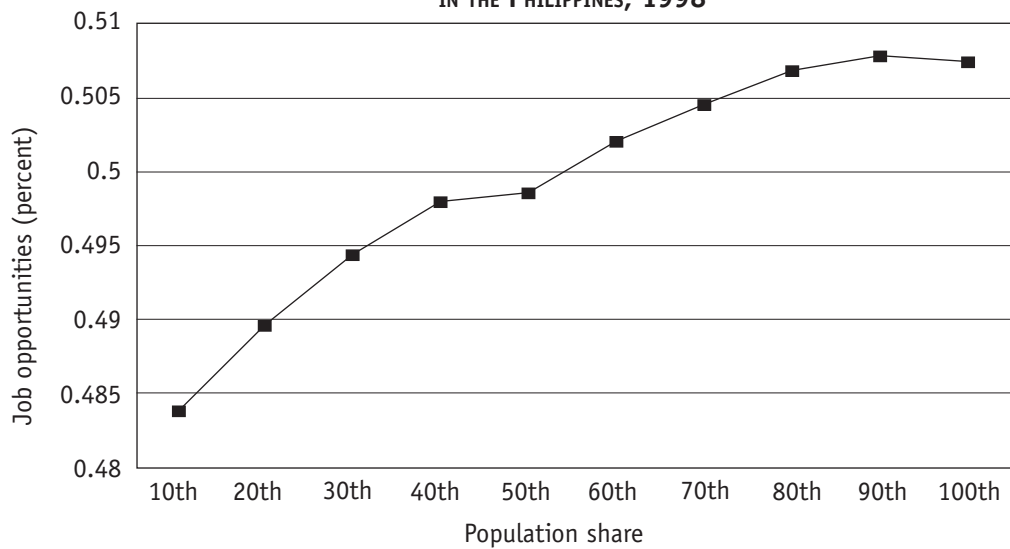
TABLE 4
OPPORTUNITY INDEX FOR EMPLOYMENT BY GENDER IN THE PHILIPPINES

PERCENTILE	MALE	FEMALE	TOTAL
10th	0.48	0.25	0.37
20th	0.49	0.25	0.38
30th	0.49	0.25	0.38
40th	0.50	0.25	0.38
50th	0.50	0.25	0.38
60th	0.50	0.26	0.39
70th	0.50	0.27	0.39
80th	0.51	0.27	0.40
90th	0.51	0.28	0.40
100th	0.51	0.30	0.41
Opportunity index	0.50	0.26	0.39
Equity index of opportunity	0.98	0.88	0.95
Comments	Not equitable	Not equitable	Not equitable

Source: Authors' calculation based on the 1998 APIS.

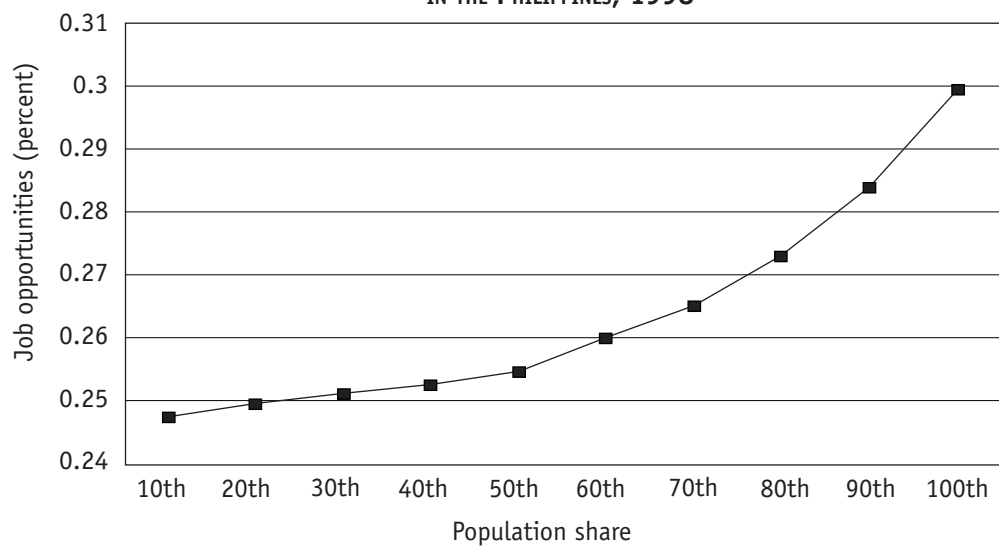
The results suggest that while more than half of the male population is employed, the corresponding figure for the female population is only 30 percent. This indicates greater access to job opportunities by the male population. Moreover, the distribution of job opportunities across the male population is shown to be more equitable than that of the female population. This finding is also supported by the opportunity curves for the two groups (see Figures 4 and 5). The entire curve for job opportunity among males (shown in Figure 4) lies above the opportunity curve for females (shown in Figure 5). At every income level, males tend to have more job opportunities than their female counterparts. This implies that (i) men enjoy greater job opportunities on average and (ii) the distribution of job opportunities among men is more equitable than among women.

FIGURE 4
OPPORTUNITY CURVE FOR EMPLOYMENT OPPORTUNITIES AMONG THE MALE POPULATION
IN THE PHILIPPINES, 1998



Source: Authors' calculations based on the 1998 APIS.

FIGURE 5
OPPORTUNITY CURVE FOR EMPLOYMENT OPPORTUNITIES AMONG THE FEMALE POPULATION
IN THE PHILIPPINES, 1998



Source: Authors' calculations based on the 1998 APIS.

The opportunity curve can be a useful tool in understanding the pattern of inclusive growth in terms of opportunities available to the population. But it does not provide a complete ranking of opportunity distributions (e.g., when the two curves cross each other). Moreover, this curve does not capture the magnitude of inclusive growth in terms of opportunities. To compensate for these shortfalls, the opportunity index is estimated, calculated from the area under the opportunity curve. The greater the value of OI, the greater will be the opportunities available to the population including the poor. The proposed OI is simply the product of the average level of opportunities available to the population and the equity index of opportunity. Note that the EIO captures the extent to which opportunities are distributed equally (or unequally) among the people. Hence, if the EIO takes a value greater (less) than 1, one can say that opportunities are distributed equitably (inequitably). Equivalently, one can define growth as inclusive (not inclusive) if the estimated value of OI is greater (less) than the average opportunities available to all.

To effectively achieve inclusive growth, the objective should be to increase the value of the opportunity index. Maximizing the value of OI can be achieved by: (i) increasing the average level of opportunities available to all; (ii) increasing the equity index of opportunity through an equitable distribution of opportunities; or (iii) both (i) and (ii). This methodology is applied in the case of the Philippines. The results in Tables 5–7 show (i) whether basic opportunities in health, education, and infrastructure are provided to all; and (ii) whether those opportunities are equally shared among the population.

Table 5 is concerned with opportunities in terms of access to health facilities, utilized when individuals are sick. The results suggest that in 1998, only 18.92% of sick individuals sought treatment.¹¹ Moreover, the overall health services in the Philippines appear to be inequitable in the sense that the health services are largely utilized by the top end of the income distribution. This is depicted in the opportunity curve in Figure 6. The inequitable opportunity of health services is also reflected by the value of the EIO for the overall health service (0.90) being less than 1, or the value of OI (17.08) being less than the average opportunity for the population (18.92).

Table 5 also shows the types of health facilities utilized by sick individuals in the Philippines. Nationally, majority of the people prefer private clinics or rural health unit (RHU) health centers: 5.13% of sick people utilize private clinics and another 4.79% utilize RHU health centers.

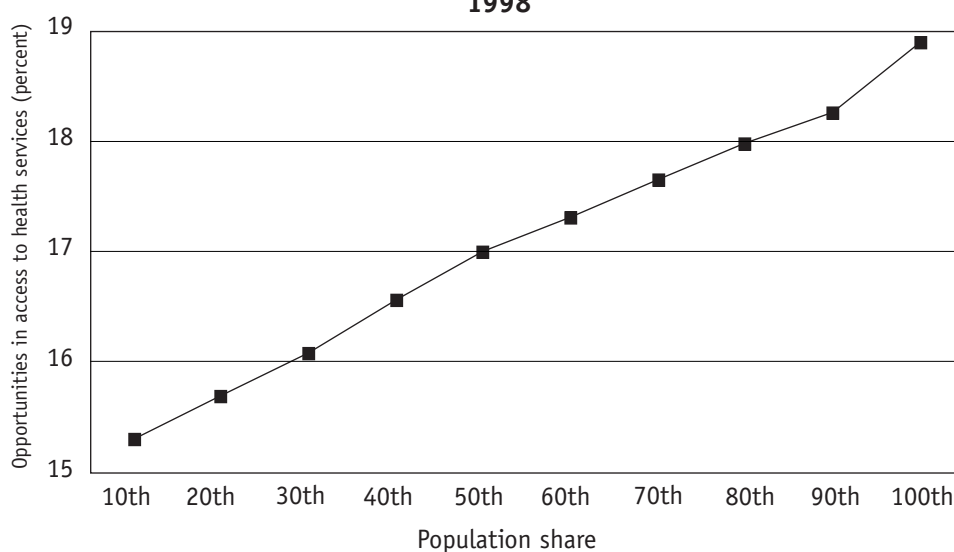
¹¹ The reasons for those not seeking medical treatment are not dealt with in detail as it is beyond the scope of the current study.

TABLE 5
OPPORTUNITY INDEX FOR ACCESS TO VARIOUS HEALTH FACILITIES IN THE PHILIPPINES, 1998

PERCENTILE	HEALTH FACILITY	GOVERNMENT HOSPITAL	PRIVATE HOSPITAL	PRIVATE CLINIC	RURAL HEALTH UNIT HEALTH CENTRE	BARANGAY HEALTH STATION	OTHER HEALTH FACILITY
10th	15.31	2.48	0.91	1.91	6.16	3.60	0.50
20th	15.69	2.83	0.96	2.08	6.31	3.43	0.41
30th	16.09	3.10	1.06	2.26	6.20	3.47	0.39
40th	16.56	3.27	1.22	2.66	6.13	3.36	0.34
50th	17.00	3.43	1.34	2.99	6.06	3.30	0.32
60th	17.32	3.52	1.50	3.35	5.91	3.19	0.30
70th	17.67	3.64	1.80	3.70	5.70	3.00	0.28
80th	18.00	3.69	2.06	4.14	5.47	2.84	0.27
90th	18.28	3.72	2.46	4.50	5.16	2.66	0.27
100th	18.92	3.70	3.06	5.13	4.79	2.45	0.27
Opportunity index	17.08	3.34	1.64	3.27	5.79	3.13	0.33
Equity index of opportunity	0.90	0.90	0.53	0.64	1.21	1.28	1.25
Comments	Not equitable	Not equitable	Not equitable	Not equitable	Equitable	Equitable	Equitable

Note: *Barangay* is the smallest political unit in the Philippines.
 Source: Authors' calculation based on the 1998 APIS.

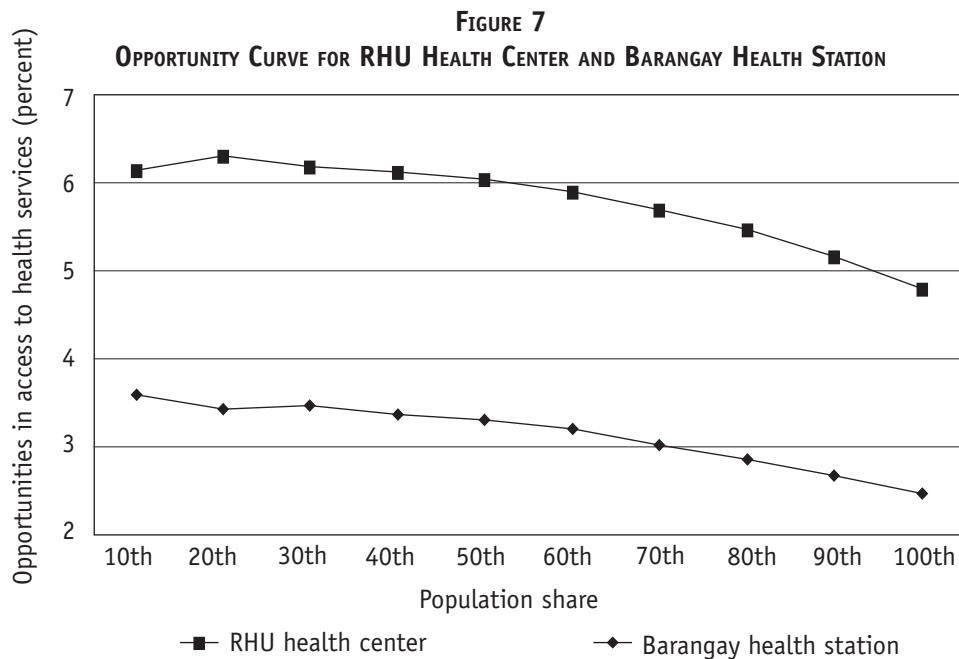
FIGURE 6
OPPORTUNITY CURVE FOR HEALTH SERVICES IN THE PHILIPPINES, 1998



Source: Authors' calculations based on the 1998 APIS.

More interestingly, although the average opportunity in terms of access to private clinics is greater than the others, the distribution is highly skewed toward the top end of the income distribution. In other words, the health service provided by private clinics tends to be highly inequitable in the Philippines: the EIO for private clinic (0.64) is less than 1; or the OI (3.27) is less than the average opportunity for the population of 5.13. Similarly, the health services provided by government and private hospitals are heavily utilized by the richer segments of the society. This is also evident in Figure 6.

On the contrary, health facilities such as RHU and *barangay* health stations are utilized more by the people at the lower end of the income distribution. This is evident in the downward-sloping opportunity curves shown in Figure 7. The values for EIO and OI confirm the finding that both health services are highly utilized by the poor segments of the society.



Source: Authors' calculations based on the 1998 APIS.

The methodology is applied similarly to explore to what extent the opportunities of education at primary and secondary levels are shared among children from the poor and nonpoor households in the Philippines. Table 6 shows that a very high proportion (95.9%) of children aged between 7 and 12 years attend primary school in the Philippines. The corresponding figure for secondary education is rather lower at 83.25% of children aged between 13–16 years.

These school attendance figures do not indicate whether the educational opportunities are equally shared among the children irrespective of their income status. The distribution of the educational opportunities is in fact unequal: it is even more unequal at the secondary level. In this case, the opportunity curves for both educational levels have an upward slope. This suggests that

children at the bottom end of the income distribution have lower access to primary and secondary education. This finding is confirmed by the estimated opportunity indices: the values of the EIO are lower than 1 and the values of the OI are lower than the national average at both primary and secondary levels.

TABLE 6
OPPORTUNITY INDEX FOR ACCESS TO PRIMARY AND SECONDARY SCHOOLS
IN THE PHILIPPINES, 1998

PERCENTILE	CHILDREN	CHILDREN
	7–12 YEARS	13–16 YEARS
	ATTENDING SCHOOL	ATTENDING SCHOOL
10th	89.66	69.22
20th	90.72	70.80
30th	92.01	72.53
40th	92.97	74.28
50th	93.52	76.14
60th	94.10	77.28
70th	94.61	78.77
80th	95.09	80.18
90th	95.53	81.72
100th	95.90	83.25
Opportunity index	93.41	76.42
Equity index of opportunity	0.97	0.92
Comments	Not equitable	Not equitable

Source: Authors' calculation based on the 1998 APIS.

Basic infrastructure services make significant contributions to people's well-being. Basic services such as electricity, sanitary toilets, and clean drinking water have direct impacts on people's health status and overall well-being. A number of studies reveal that a household's access to such basic services is highly and significantly correlated with a lower probability of being poor.

In the case of the Philippines, Table 7 shows that the benefits generated from all types of basic infrastructure services are not equally shared across the population, particularly for electricity and clean drinking water. The table shows that the poor at the lower end of the income distribution have far less access to basic infrastructure services than the rich at the upper end of the distribution.¹²

¹² The proposed methodology is applied only to two key measures outlined in Section III, employment; and basic social services in education, health, and infrastructure. In other words, the key measure of "social safety nets and targeted intervention" is not covered in the empirical section. This is because the key measure discussed in Section IIIC requires a different methodology to capture targeting efficiency, rather than accessibility and equity of safety programs. The critical issues pertinent to the third key measure are (i) how well social safety net programs are targeted at specific groups who are in need; and (ii) to what extent the targeted groups (compared to the nontargeted groups) have been benefited from such programs. Developing a measure to monitor the third key measure could be a scope for future research.

TABLE 7
OPPORTUNITY INDEX FOR ACCESS TO BASIC INFRASTRUCTURE IN THE PHILIPPINES, 1998

PERCENTILE	ELECTRICITY	SANITARY TOILETS	CLEAN DRINKING WATER
10th	29.34	73.73	27.16
20th	35.67	76.18	29.01
30th	41.95	78.39	31.06
40th	48.15	80.44	32.32
50th	53.42	82.26	33.73
60th	58.28	83.99	35.67
70th	62.62	85.54	37.71
80th	66.36	86.92	40.12
90th	69.58	88.23	42.53
100th	72.45	89.37	45.48
Opportunity index	53.78	82.51	35.48
Equity index of opportunity	0.74	0.92	0.78
Comments	Not equitable	Not equitable	Not equitable

Source: Authors' calculation based on the 1998 APIS.

VI. SOME ISSUES FOR FURTHER RESEARCH

This paper introduces a systematic way of measuring inclusive growth. Similar to the idea of a social welfare function, the paper has attempted to introduce 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 question is how to assess the equitable opportunities over time. This type of dynamic analysis can be done by examining how the opportunity curves shifts over 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 of the inclusiveness of growth over time for an individual country.

Finally, the proposed opportunity index is largely concerned with access to and equity of opportunities available to the population in society. In this respect, the proposed index is entirely

different from indicators developed by the UNDP for the Millennium Development Goals (MDG) and the human development index (HDI). While our opportunity index describes the process to meet an end (or means to an end), the UNDP indicators focus on the outcomes of well-being (e.g., life expectancy at birth, gross enrollment rates, etc). Monitoring the means or process will ensure achieving the outcomes. Yet, the mere focus on achieving an outcome may ignore the means to meet the end. For instance, gross enrollment rate is an important indicator for both MDG and HDI. However, both MDG and HDI tend to simply focus on improvement in the average gross enrollment rate for a country. Assessing access to basic education is indeed important, but evaluating whether the access to basic education is equally shared among all segments of population is also important (or may be more important than the issue of accessibility). The proposed opportunity index takes into account both issues.

Similar to the HDI, we may be able to develop a single composite index that consists of four key opportunities that are critical for people's overall well-being, namely employment, health and educational services, and material standard of living. This composite index may be useful for cross-country rankings, although it does suffer from two shortcomings: (i) it is derived based solely on the equity of opportunity among the population (i.e., average of the equity index of opportunity for five key opportunities); and (ii) the composite index may have the virtue of being simple but it uses a simple average of the five key components included in the index (i.e., equal weights assigned to each component). Developing an index that can fully address such shortcomings could be another scope for future research.

Nevertheless, it is not necessary to convert several indicators of well-being into one single index, as correctly argued by Sen (1989). The concept of well-being has an inherent plurality and should not be seen as a unidimensional measure such as that of weight or height. Therefore, inclusiveness of growth could be monitored better for a specific country rather than across countries. In addition to the key monitoring indicators discussed in this study, other additional indicators could be chosen by a country, depending on its policy objectives. Monitoring these associated indicators for growth inclusiveness over time would involve very high demands on information. Micro household data should be available on a regular basis and comparable over time and across space.

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