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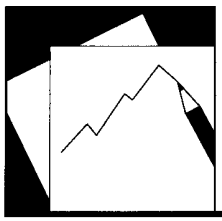

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Inclusive Growth: An Application of the Social Opportunity Function to Selected African Countries

Prepared by Olumuyiwa S. Adedeji, Huancheng Du, and Maxwell Opoku-Afari

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Prepared by Olumuyiwa S. Adedeji, Huancheng Du, and Maxwell Opoku-Afari[1]

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Abstract

The inclusiveness of growth depends on the extent of access to economic and social opportunities. This paper applies the concept of social opportunity function to ascertain the inclusiveness of growth episodes in selected African countries. Premised on the concept of social welfare function, inclusive growth is associated with increased average opportunities available to the population and improvement in their distribution. The paper establishes that the high growth episodes in the last decade in the selected countries came with increased average opportunities in education and health; but distribution of such opportunities varied across countries, depending on the country-specific policies underpining the growth episodes.

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Authors' E-Mail Addresses: oadedeji@imf.org; mopokuafari@imf.org; hd0122a@student.american.edu

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I. Introduction and Background

Global developments, including the 2008–09 financial crisis and the ensuing high unemployment rate, the Arab spring, and sustained economic growth in low-income countries combined with still high poverty rates, have elevated the critical issue of inequities in income and opportunities to the center of policy discussions. Income inequality has its roots in unequal opportunities. Individuals that face better opportunities are able to develop their full human potential and achieve more favorable outcomes in terms of education and income. Access to health care, also, is critical to avoiding economic hardship that could emanate from falling ill. Ensuring access to and equity of opportunities created by economic growth, including equal access to basic social services (education and health services) is of utmost importance.

Many studies have examined the important issue of inclusive growth. Most of these studies have focused on whether enhanced economic growth has led to poverty reduction, with some studies extending this to look at the distributional impact of such growth (Fosu, 2011). Emphasis has also been placed on other important areas and aspects of inclusive growth, including benefit incidence analysis of health and education expenditure (Gaddah and Munro, 2011; Kamgnia, 2008); labor market issues, especially closing the jobs gap (Leigh and Flores, 2012) by focusing on the characteristics of the labor market that tend to limit job creation, the education system, and the role of unions and centralized wage bargaining systems; the impact of policies, including in particular of fiscal expenditure allocations (Clements, Gupta, and Nozaki, 2011). Berg and Ostry (2011) demonstrate that chronic income inequality is detrimental to economic growth, and more equal countries are likely to experience durable and sustainable growth spells.

Garcia-Verdu, Selasse, and Thomas (2011) opine that a robust assessment of the inclusiveness of sub-Saharan African (SSA) growth requires more of a case study approach through closer examination of household survey data. They examined household survey data for six countries (Cameroon, Ghana, Mozambique, Tanzania, Uganda, Zambia). They found that the poorest quartile experienced substantial annual household per capita consumption growth in three of the four high-growth countries (Ghana, Tanzania, Uganda). By contrast, the poorest quartile of the consumption distribution in the low-growth countries experienced low (Cameroon) or even negative (Zambia) changes in consumption, and the results for Mozambique depend on the choice of deflator (the consumer price index, CPI, or regional price indices) for the nominal household per capita consumption.

An area that has not received much attention is how access to opportunities could help aid the participation of a larger segment of the population in the growth process. Equitable access to economic opportunities is essentially a precondition for inclusiveness of economic growth. Whether individuals can participate in economic opportunities depends on individual

capability, possibly underpinned by levels of education and health conditions. Using the concept of social opportunity function, we focus on access to education and health as possible important channels that can aid an economic agent to better participate in a growth process.[2]

The use of social opportunity function[3] to assess the inclusiveness of growth in selected African countries is the unique contribution of this paper. Premised on the concept of social opportunity function, which is similar to social welfare function, inclusive growth is demonstrated in the paper to entail increased average opportunities available to the population and equalities of their distribution. It is important to note that the more critical issue is not a focus on the static analysis of a given opportunity, but an in-depth assessment of how the opportunity changes over time. Constructing opportunity curves for different periods makes this dynamic analysis possible. As an illustration, if the entire opportunity curve shifts upward, this suggests inclusive growth in the sense that a growth process is associated with both an increase in average opportunities available to the entire population and an increase in opportunities available to the poor segment of the population. This analytical framework allows the assessment of the inclusiveness of growth in a country over time.

In implementing this framework empirically, we focus on the same set of countries (Cameroon, Ghana, Mozambique, Tanzania, Zambia)[4] covered in Garcia-Verdu, Selasse, and Thomas (2011) but offer a complementary approach to analyzing the inclusiveness of growth through the application of growth incidence curves. Aside from opportunity curves, which are similar to growth incidence curves, the paper also creates an equity index of opportunity that measures equity in access to education and health services.

By applying the social opportunity functions to assess the inclusiveness of growth in selected SSA economies that have experienced growth episodes in the last decade, we establish that periods of growth also coincide with periods of increased access (or opportunities). This result corroborates the findings in Garcia-Verdu, Selasse, and Thomas (2011). We are also

[2] We recognize that the ability of a country to educate its population must not rely solely on schooling or enrollment rates, but also on its capacity to provide knowledge and skills required to perform effectively in broader society. While access is mostly certainly a necessary condition for this type of education, it is by no means a sufficient one. We recognize the limitations of this paper, because the focus is on access to education and health care, but not on quality. The household survey data used for the analysis do not contain information on the quality of primary and secondary education as well as health services. However, the issue of improved access to education and health care is relevant in the countries covered in the paper, and we carry out in Section III a descriptive analysis of key education and health indicators, with some emphasis on the quality.

[3] See Ali and Son (2007) for the empirical application of social opportunity function to the Philippines.

[4] The choice of these countries reflects the availability of household survey data that are comparable over time and coincide, to the largest extent possible, with the more recent period when growth accelerated.

able to establish that average access to and distribution of education and health has increased across all these countries over time. The paper's specific findings are as follows:

Primary education: empirical results show upward sloping opportunity curves for primary school enrollment, indicating that in general access to primary education has not been pro-poor. However, in-country dynamics show outward shifts of the opportunity curves, an indication of improved access to primary school education in countries under analysis. Our quantitative measure of opportunity indices for primary education increased for all the countries, underpinned by increased average opportunities and improvement in the distribution of access to primary school education. The outward shifts of the opportunity curves for the countries under analysis suggest that the growth process has been inclusive, using the indicator of access to education.

Secondary education: evidence from the survey shows that the averages for secondary education are lower across all countries compared to primary education access. On average—for all five countries—access is about 50 percent. Similar to trends in primary education, the opportunity curves for secondary education for all countries across all years are also upward sloping, implying that the distribution of access to secondary education could be considered non-pro-poor. However, focusing on dynamics, there have been increases in average opportunities and in their distribution. Based on these findings, although there is scope to make the growth process more inclusive, the observed growth so far was accompanied by an outward shift of opportunity curves for secondary school education, indicating an inclusive growth process.

Health care: The general trend has been one of improvement in access to health care services. The key result is that the improved opportunity index for health care services was underpinned by a combination of an increase in average opportunity and improved distribution, suggesting an inclusive growth process.

The empirical results, from the application of social opportunity function, bring out important aspects of the provision of public service in education and health care in the countries under analysis, especially the criticality of effective design and implementation of education and health services that will meet the needs of the poor segment of the population, which is important to sustaining reforms and growth momentum. Because the current framework can also be used to address issues related to access to and equity of job opportunities and finance and land ownership, the tools provided in this paper can effectively be deployed to initiate policies and measures that will aid in directing the limited resources of governments to the needy, thereby significantly contributing to the effort to reduce inequality in access to opportunities, which will help to contribute to reducing poverty.

The rest of the paper is organized as follows: Section II focuses on the concept of inclusive growth and the conceptual framework for the social welfare function and the social opportunity curve. Section III discusses key stylized facts on the education and health care sectors in countries under analysis. Section IV presents the empirical results from the application of social opportunity curves to selected African countries. Section V concludes and offers policy recommendations.

II. Conceptual Framework: The Inclusive Growth Concept and The Social Opportunity Function

A. The Inclusive Growth Concept

Various definitions of "inclusive growth" all underscore the need for new approaches to addressing economic and social inequalities, including inequalities in income, assets, financial and human capital, education and health, and economic opportunities. The emerging consensus is that rapid, sustainable economic growth must also be equitable, which matters for poverty reduction (Stuart, 2011). The international community is, therefore, refocusing on "inclusive," "sustainable," and "shared" growth. These trio-objectives have become more apparent in the wake of recent global economic and food and fuel crises and how these have affected the poor because of lack of safety nets.

The report of the Eminent Persons Group (ADB, 2007) made reference to the term "inclusive growth," which focuses on making sure that the economic opportunities created by growth are available to all—particularly the poor—to the maximum possible extent (in line with Ali and Zhuang, 2007). Growth in itself does not guarantee that all persons will benefit; it can bypass the very poor segment of the population, culminating in worsening of income distribution. High and rising income inequality can lower the impact on poverty reduction of a given rate of growth, and can also reduce the growth rate itself (Bourguignon, 2003). High inequality also has implications for political stability and social cohesion needed for sustainable growth (Berg and Ostry, 2011). Hence, reducing inequality is a major development and stability challenge—a concern that should be at the core of all development strategies, bringing to the fore the important issue of opportunities for participation in the growth process.

In line with this definition, we draw on the social welfare function to derive social opportunity function to assess the inclusiveness of economic growth for selected African countries, as conducted by Ali and Son (2007) for the Philippines.

B. The Social Opportunity Function

This paper defines inclusive growth as the maximization of the social opportunity function, which depends on increasing the average opportunities available to the population and distributing the available opportunities equitably among the population. In this context, the

social opportunity function attaches greater weight to the opportunities enjoyed by the poor: the poorer a person is, the greater the weight will be. Such a weighting technique ensures that opportunities created for the poor are more important relative to those created for the non-poor, i.e., if the additional opportunity created favors the poor without making the non-poor segment worse off, then the social opportunity increases, culminating in more inclusive growth.

Drawing on the work of Ali and Son (2007), assuming there are n persons in the population with incomes $x_1, x_2, x_3, ..., x_n$ where x_1 is the poorest person in the population and x_n is the richest. The social welfare function, *W*, which is an increasing function of its arguments (income x), is denoted by

$$W = W(x_1, x_2, ..., x_n) \tag{1.1}$$

As a parallel, a social opportunity function, *O*, can be defined as an increasing function of its arguments, which in this case are the opportunities enjoyed by individuals in the population. The opportunity function, O, is denoted by

$$O = O(y_1, y_2, ..., y_n) \tag{1.2}$$

Where y_i captures the opportunity enjoyed by the i^{th} person with income x_i.

Opportunity can take the form of access to healthcare or education and y_i takes the form of a binary value with a value of 1 when the i^{th} person has access to a given opportunity and 0 if the opposite were to be the case. The percentage of the population, *PN*, that has access to a given opportunity, is provided by the opportunity curve in (1.3) as

$$Y^*(p) = \frac{\sum_{i}^{pN} y_i}{pN} \tag{1.3}$$

where p is the cumulative percentage of the population. Given the condition that y_i is a binary number that assumes the value of 0 or 1, the average opportunity *Y*(p)* is exactly the same as the percentage of the population with access to a particular opportunity.

Maximizing *Y*(p)* as provided in equation (1.3) is a necessary but not sufficient condition in establishing inclusive growth. It is important to also look at the distribution of the opportunities across the different segments of the population. Incorporating distribution considerations requires that the social opportunity function satisfies the transfer principle. That is, a transfer of opportunity from a non-poor person to a relatively poor person will improve the social opportunity function. This is captured by

$$\frac{\partial O}{\partial y_i} > \frac{\partial O}{\partial y_j} \text{ if } x_i < x_j \tag{1.4}$$

The opportunity curve generated in this conceptual framework is analogous to the Lorenz curve. It is essentially a curve capturing the relationship between the cumulative percentage of the population and the magnitude of access to a particular opportunity. This is the social opportunity curve, as shown in Figures 1 and 2.

Figure 1. Non Pro-Poor Social Opportunity Curve

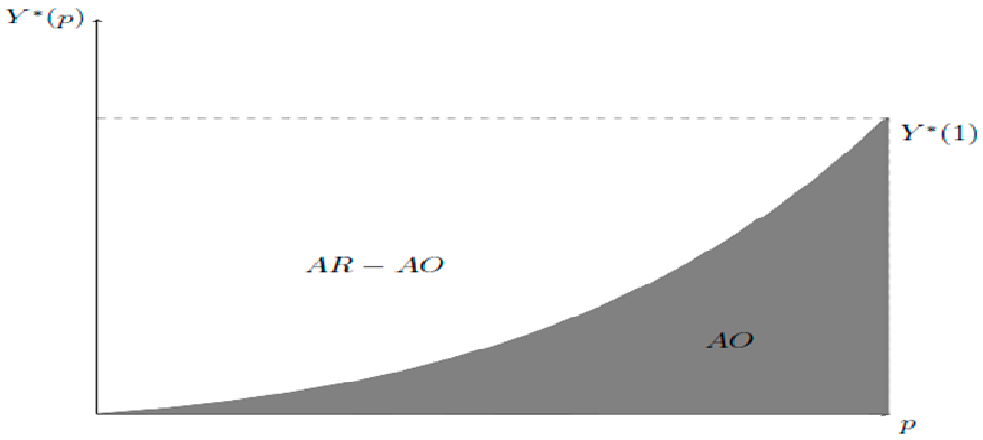
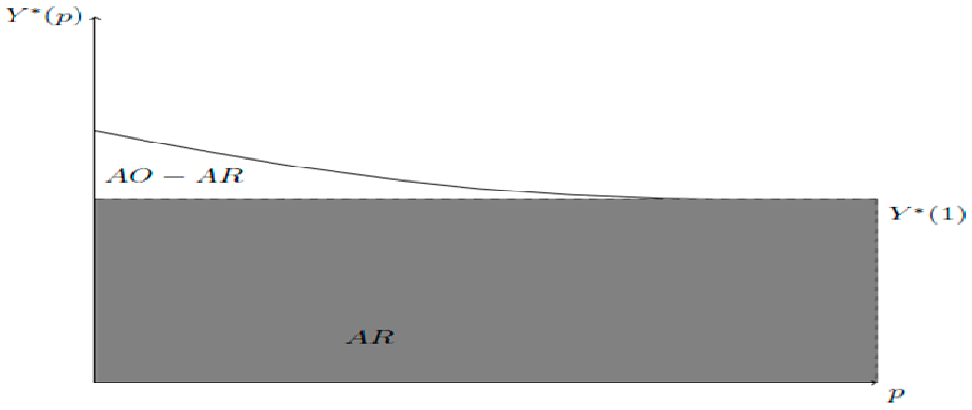


Figure 2. Pro-Poor Social Opportunity Curve



From Figures 1 and 2 above, the horizontal axis, p, is the cumulative percentage of the population whose income, denoted by x, is organized in an ascending order (poor to non-poor) where AO is the area under the opportunity curve (capturing opportunity index) and AR is the area of the rectangle (Figures 1 and 2), which is used to derive the equity index of opportunity (EI) (see the derivations in equations 1.5 through 1.8). The vertical axis $Y^*(p)$ measures the percentage of the population, pN out of a total population N, that has access to a given opportunity. The curve $Y^*(p)$ is the opportunity curve, and the slope of this curve measures the marginal change in access to opportunity as a result of adding one more non-poor person to the population, that is, the marginal loss of opportunity owing to competition from the non-poor segment of the population.

If $\frac{dY^*(p)}{dp} > 0, 0 < p < 1,$ it means that the opportunity curve is upward sloping (Figure 1). This would mean that as p increases, the more relatively non-poor people added to the group pN, the percentage of people who have access to a given opportunity would increase. This type of access to opportunity is classified as not pro-poor—that is, it favors the non-poor segment of the population. However, if $\frac{dY^*(p)}{dp} < 0, 0 < p < 1,$ then opportunity distribution is pro-poor because as p increases, the more relatively non-poor people added to the group, pN, the lower the percentage of people that have access to a given opportunity within the group, pN. In this case, the new people being added to the group have opportunities below the initial mean value of opportunity and thereby reduce the overall mean value of opportunity. This is represented by a downward sloping opportunity curve (Figure 2). Last, if $\frac{dY^*(p)}{dp} = 0, 0 < p < 1,$ then there is perfect equity in access to opportunities. That is, there is equitable distribution of opportunities regardless of income levels.

Based on Figures 1 and 2, if government policies lead to an outward shift in the opportunity curve at all points, then growth is viewed as being inclusive. A parallel shift in the entire opportunity curve represents a situation where everyone in the population (including the poor) is experiencing an increase in opportunities—an inclusive growth episode. Thus, by examining the generalized concentration curves of two distributions, we can ascertain which of these two would provide greater social opportunities given the two curves do not intersect.

To reflect on the magnitude of the change in opportunity, we take a simple form of the social opportunity function and estimate an index from the area under the opportunity curve (as shown in Figures 1 and 2). We call this the opportunity index as defined below:

$$AO = \int_{p=0}^{p=1} \frac{\sum_{i}^{pN} y_i}{pN} dp \tag{1.5}$$

A higher *AO* implies greater opportunities available to the population. This means it should be the objective of government policies to maximize the value of *AO*.

If everyone in the population enjoys exactly the same opportunity, then *AO = Y*(p).* As such, the deviation of *AO* from *Y*(p)* measures how opportunities are distributed across the population. If *AO> Y*(p)*, then opportunities are equitably distributed (pro-poor). Similarly, if *AO< Y*(p)*, then opportunities are inequitably distributed (not pro-poor). This analogy is used to create what we have termed the equity index of opportunity (*EI*) denoted as

$$EI = {AO(p)}\Big/{Y^*(p)} \tag{1.6}$$

This index allows us to measure equity in the distribution of opportunities across different segments of the population. If $EI > 1$, it means a downward sloping opportunity curve, which is pro-poor. Where $EI = 1$, we have perfect equity in terms of distribution of opportunities; and where $EI < 1$, it implies an upward sloping opportunity curve (opportunities are not equitably distributed: non-pro-poor).

By rewriting equation (1.6), we derive the opportunity index *(AO(p))* as the product of the equity index of opportunity (*EI)* and average opportunities *Y*(P)*:

$$AO(p) = EI * Y^*(p) \tag{1.7}$$

Equation (1.7) simplifies the interpretation of the opportunity index. We are able to demonstrate that to achieve inclusive growth (equal to increasing the opportunity index), requires (i) increasing the average level of opportunities *Y*(p)*; (ii) increasing the equity in the distribution of opportunities *(EI)*, or simultaneous increases in both the average opportunity (*Y*(p))* and improvement in the equality of the distribution of opportunities *(EI)*.

By totally differentiating equation (1.7), we arrive at the following interesting relation:

$$dAO(p) = (EI)dY^*(p) + Y^*(p)d(EI) \tag{1.8}$$

where *d AO (P)* measures the change in the degree of growth inclusiveness. Growth becomes more inclusive if *d AO (P)* is > 0. The first term on the right side of equation (1.8) is the contribution to inclusiveness of growth as a result of increasing the average opportunity in the economy when the relative distribution of the opportunity remains constant. The second term of the equation shows the contribution of changes in the distribution when the average opportunity does not change. The main conclusion from this is that if the change in average opportunities is positive, and there is more equity in the distribution of opportunities, growth will always be inclusive.

III. Key Stylized Facts on the Education and Health Sectors in Selected African Countries

The section provides the context for the empirical results obtained for the five countries under analysis, using the concepts of opportunity curve, opportunity index, and equity index of opportunity. This paper does not attempt to assess the impact of government policies as enunciated below. By providing the context, the paper gives a useful background for a better understanding of the results of the application of social opportunity curve, opportunity index, and equity index of opportunity in Section IV of the paper.

A. Cameroon

Primary school education has been free since 2000. In 2006, the government adopted a 10-year education policy, with enhanced focus on universal primary education combined with improved access to and quality of education. The policy emphasized strengthening partnerships with the private sector and civil society as well as improving the governance of the education system. The gross primary enrollment rate increased from about 88 percent in 2000 to about 120 percent in 2010 (Table 1). Secondary school enrollment showed an upward trend during the same period, increasing from about 28 to 42 percent. The removal of school fees in primary education in 2000 appeared to have spurred the increase in total enrollment.

Despite the noticeable increase in primary and secondary school enrollment, the Cameroonian education system faces a number of challenges in providing quality primary and secondary school education (UNESCO, 2005 and 2010). Although there have been sustained declines, pupil-teacher ratio (both for primary and secondary) is fairly high (Table 1). The literacy rate marginally increased from around 68 percent in 2000 to about 71 percent in 2007, and the primary school completion rate moved from 51 percent in 2000 to 79 percent in 2010.

In health care, the public and the private sectors provide health care services (Kamgnia, 2008). Apart from being a major provider of health services, the government defines the health policy and also manages the health system. The policy on primary health

care dated back to the 1980s. The policy aimed at making health care universally accessible to all individuals. The strategy emphasized primary health care and the participation of the beneficiary communities in cofinancing and comanagement of health care facilities (Cameroon's Ministry of Public Health, 1992).

The government's health policy reforms emphasized among other things equity, increased access to health services, and enhanced quality. The reforms introduced user charges in government health facilities to raise more funds for the provision of health services. Comanagement of the health system, linked to decentralization and cost-recovery measures, has been promoted since June 1990. Key health indicators have improved somewhat. While the mortality rate (under 5) has fallen from 148 per 1,000 live births in 1996 to 136 in 2010, life expectancy fell slightly from 52 to 51 years.

Table 1. Cameroon: Education and Health Indicators

	1996	2000	2005	2006	2007	2010
School enrollment, primary (% gross)	74.7	87.5	109.1	109.4	112.8	119.8
School enrollment, primary (% net)	n.a.	n.a.	n.a.	n.a.	n.a.	92.4
School enrollment, secondary (% gross)	n.a.	27.7	27.8	24.3	n.a.	42.2
Literacy rate, adult total (% of people ages 15 and above)	n.a.	68.4	n.a.	n.a.	70.7	n.a.
Primary completion rate, total (% of relevant age group)	n.a.	51.0	52.9	52.9	57.1	78.7
Pupil-teacher ratio, primary	n.a.	51.9	47.8	44.7	44.4	45.5
Pupil-teacher ratio, secondary	n.a.	23.6	16.2	16.2	n.a.	n.a.
Mortality rate, under-5 (per 1'000 live births)	148.1	147.5	142.1	141.0	139.9	136.2
Life expectancy at birth, total (years)	51.6	50.1	49.4	49.6	49.8	51.1

Source: World Bank, World Development Indicators.

B. Ghana

The government of Ghana has implemented various policies and measures with the overarching goal of achieving universal primary education by 2015. Strategies adopted include the introduction of the "capitation grant" (removal of school fees),[5] expansion of early childhood development services, and the introduction of nutrition and school feeding programs. In May 2003, the ministry of education and sports came out with the education strategy plan (ESP) for 2003–2015. The ESP was underpinned by many documents and policy frameworks, especially the Education for All goals, the Millennium Development Goals, and the Ghana Poverty Reduction Strategy. Secondary school education, on the other hand, requires payment of tuition for boarding and feeding.

[5]There has been nationwide adoption of what is known as the "capitation grant system" since early 2005. Under this system, every public kindergarten, primary school, and junior secondary school receives a grant of about $3.30 per pupil per year. Schools are not allowed to charge any fees to parents.

A remarkable increase has occurred in access to primary and secondary education. The gross primary enrollment rate moved from about 81 percent in 1999 to about 107 percent in 2011 (Table 2), and net primary enrollment increased from 61 percent to 84 percent during the same period. Secondary school enrollment, while significantly below the primary school enrollment rate, increased from 40 percent in 1999 to 58 percent in 2011, and net enrollment increased by 15 percentage points during the same period to about 49 percent.

A 2004 World Bank report, *Books, Buildings and Learning Outcomes,* emphasizes the importance of enhancing learning outcomes. As shown in Table 2, increased enrollment rates have been accompanied by higher pupil-teacher ratios (primary), while those for secondary school remained broadly unchanged at about 19. The literacy rate was about 67 percent in 2009, and the primary school completion rate increased substantially from 64 percent in 1991 to 94 percent in 2011.

Regarding health care, the health sector reform of 1985 aimed at decentralizing health administration to local levels (Gaddah and Munro, 2011). Several reforms that followed resulted in a fully decentralized system of health care delivery, from national to subdistrict levels. User charges were also introduced as a cost-recovery measure. The central government remains the main financier of public health care. The search for a more sustainable health financing scheme lingered on until 2003 when health insurance was enacted, introducing the district mutual health insurance, private health insurance, and private mutual health insurance schemes. We notice improvements in health indicators, with mortality rate (under 5) decreasing from 119 per 1,000 live births in 1991 to 77 in 2009 and life expectancy increasing from 57 to 63 years in the same period.

Table 2. Ghana: Education and Health Indicators

	1991	1997	1999	2005	2009	2011
School enrollment, primary (% gross)	77.6	80.6	80.5	90.3	106.3	107.3
School enrollment, primary (% net)	n.a.	n.a.	60.7	66.5	76.7	84.0
School enrollment, secondary (% gross)	n.a.	27.7	40.2	47.2	59.1	58.1
School enrollment, secondary (% net)	n.a.	n.a.	34.0	40.1	47.3	48.7
Literacy rate, adult total (% of people ages 15 and above)	n.a.	n.a.	n.a.	n.a.	66.6	n.a.
Primary completion rate, total (% of relevant age group)	63.7	n.a.	68.0	74.6	86.7	94.0
Pupil-teacher ratio, primary	29.1	n.a.	29.6	32.8	33.1	31.0
Pupil-teacher ratio, secondary	18.7	n.a.	19.6	18.9	18.5	18.7
Mortality rate, under-5 (per 1'000 live births)	118.5	107.0	101.8	86.0	76.6	n.a.
Life expectancy at birth, total (years)	57.3	58.0	58.1	61.0	63.4	n.a.

Source: World Bank, World Development Indicators.

C. Mozambique

In the 1990s, various preparatory policy papers culminated in the adoption of the first strategic plan for the education sector, which was put in place in 1997 and implemented between 1999 and 2005. The implementation saw the construction of new primary and secondary school facilities and the rehabilitation of those that had been destroyed by the war. In 2006, a second strategic plan for education and culture was unveiled for 2006–2010/11. The objectives of the strategy, including universal primary education by 2015, were closely linked to the government's poverty reduction strategy. During these periods, Mozambique embarked on a rapid expansion of access to primary schooling, with emphasis on free and compulsory primary education.

There is a clear division of responsibilities in policy implementation between local and central bodies. While central bodies design, monitor, and inspect policy implementation, local authorities are in charge of implementation (Spaull, 2011). The gross primary enrollment rate increased substantially from about 66 percent in 1995 to about 114 percent in 2009 (Table 3). Primary school net enrollment ratio increased to 90 percent in 2009 from 44 percent in 1995. Similarly, secondary school gross enrollment increased from a low of 5 percent in 1999 to 23 percent in 2009, and net enrollment increased from 3 percent to 15 percent in the same period. Concerning the quality of education, Mozambique shows a high pupil-to-teacher ratio, increasing from 58 percent in 1999 to 61 percent in 2009 for primary education; and in the same period the ratio for secondary education increased from 33 to 38 percent. Because of the rapid expansion of primary school enrollments, many schools operate more than one shift in a day (Spaull, 2011). The literacy rate was 55 percent in 2009, and the primary school completion rate increased from 26 percent in 1995 to 56 percent in 2009.

Regarding the health care sector, the establishment of a national health system combined with a model for health financing (through national public health financing) were major reforms. The health sector strategy plan, 2007–12, and the health sector recovery program, 1994–99, defined the health sector contribution to poverty reduction through providing universal access to health care, strengthening individuals and communities, and promoting health advocacy. Health indicators show some improvements, with the mortality rate (under 5) decreasing from 195 per 1,000 live births in 1995 to 139 in 2009, and life expectancy increasing from 45 to 49 years in 2009.

Table 3. Mozambique: Education and Health Indicators

	1995	1996	1999	2002	2008	2009
School enrollment, primary (% gross)	66.2	n.a.	69.1	84.1	114.1	114.2
School enrollment, primary (% net)	43.8	n.a.	52.0	56.4	89.2	90.4
School enrollment, secondary (% gross)	7.3	n.a.	5.2	8.4	20.5	23.3
School enrollment, secondary (% net)	n.a.	n.a.	2.7	4.3	12.2	14.6
Literacy rate, adult total (% of people ages 15 and above)	n.a.	n.a.	n.a.	n.a.	n.a.	55.06
Primary completion rate, total (% of relevant age group)	25.9	n.a.	14.03	18.92	58.89	56.40
Pupil-teacher ratio, primary	57.6	n.a.	61.5	67.2	64.0	61.3
Pupil-teacher ratio, secondary	33.0	n.a.	n.a.	n.a.	36.7	38.0
Mortality rate, under-5 (per 1'000 live births)	195.0	191.0	180.0	169.8	144.1	139.6
Life expectancy at birth, total (years)	45.4	45.9	47.0	47.5	48.9	49.3

Source: World Bank, World Development Indicators.

D. Tanzania

In Tanzania, by the late 1990s, the government produced the basic education master plan for 1998–2002. This plan developed in tandem with the formulation of the education sector development program (ESDP) process that began in 1998. The ESDP led to the development of the primary education development plan (PEDP), whose underlying principles were access, equity, and quality for all children. A key policy decision on access and equity was to abolish school fees and all other mandatory contributions. Since 2001, major efforts have been made to revamp primary and secondary education sectors. The primary education development plan (PEDP, 2002–2006) and the secondary education development plan (SEDP), implemented starting in 2004, have contributed to improvements in provision of basic education in the country. There was an impressive achievement in expanded enrollment in primary school education in1995–2010. Expansion of secondary enrollment has been equally impressive, though far from reaching the levels attained in primary education. The gross primary school enrollment rate increased significantly from about 68 percent in 1995 to about 102 percent in 2009 (Table 4). Primary school net enrollment ratio increased from 49 percent in 1995 to 98 percent in 2008.

Key challenges in maintaining quality education remain. Teaching and learning have been somewhat compromised by large classes and a shortage of teachers. Some studies (Sifuna, 2007; and Sumra and Rajani, 2007) found teachers handling large classes of 60–80 students or even 100 pupils a class. Sifuna (2007) finds that although the interventions to provide universal primary education from the 1970s into the twenty-first century have made significant differences in the lives of many communities by increasing access to education of children who would have been denied schooling, quality indicators (including attrition and completion rates and examination scores) have stagnated at best or declined. Table 4 shows Tanzania's high pupil-to-teacher ratio, increasing from 37 percent in 1995 to 51 percent in 2010 for primary education. The literacy rate was 73 percent in 2009, and the primary school completion rate increased from 55 percent in 2005 to 90 percent in 2009.

The government's focus on health care reform began in 1994 with the goal of improving access, quality, and efficiency of service delivery. The main focus of the reform was to strengthen district health services and primary health care and secondary and tertiary service delivery. An important part of this is the policy of decentralization by devolution, which transfers authority and responsibility for health care from the central ministry of health and social welfare to local government authorities. This policy was enacted through the 1998 landmark legislation on local government reform, based on the principle of political devolution and decentralization of functions and finances.

Changes to health care financing policy were another important aspect of reform. The new financing policy included cost sharing and user fees as well as insurance mechanisms for the health sector. Fees are collected at all health facilities, with a system of waivers and exemptions to protect the poor. Several insurance mechanisms were established, targeting different populations. Tanzania is currently implementing its third health sector strategic plan (2009–2015), which was developed in line with the goals of the national strategy for growth and poverty reduction (MKUKUTA), the 2007 national health policy, and the Millennium Development Goals (MDG). Selected health indicators show some improvements, with the mortality rate (under 5) decreasing from 155 per 1,000 live births in 1995 to 92 in 2010 and life expectancy increasing from 50 to 57 years in the same period.

Table 4. Tanzania: Education and Health Indicators

	1995	2000	2005	2008	2009	2010
School enrollment, primary (% gross)	68.2	68.3	105.4	111.4	105.8	102.3
School enrollment, primary (% net)	48.7	53.1	90.8	98.0	n.a.	n.a.
School enrollment, secondary (% gross)	5.4	n.a.	n.a.	n.a.	n.a.	n.a.
School enrollment, secondary (% net)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Literacy rate, adult total (% of people ages 15 and above)	n.a.	n.a.	n.a.	n.a.	72.9	n.a.
Primary completion rate, total (% of relevant age group)	n.a.	n.a.	55.34	n.a.	102.99	89.89
Pupil-teacher ratio, primary	36.8	41.4	55.9	52.4	53.7	50.8
Pupil-teacher ratio, secondary	17.4	n.a.	n.a.	n.a.	n.a.	n.a.
Mortality rate, under-5 (per 1'000 live births)	154.6	130.2	102.8	85.4	80.4	92.4
Life expectancy at birth, total (years)	49.6	50.4	53.3	55.8	56.6	57.4

Source: World Bank, World Development Indicators.

E. Zambia

In Zambia, several education policies have been developed over time to provide a vision and strategies in education provision. Major among these policies was "Focus on Learning," of 1992, and "Educating our Future," of 1996. The government made progress in this sector between 2002 and 2009, by eliminating school fees for students in grades 1 through 7 and by providing critical infrastructure. Gross primary school enrollment increased from 97 percent in 1990 to 115 percent in 2010 (Table 5). The net primary school enrollment rate increased from 77 percent in 1994 to 91 percent in 2010. This is a decline compared to the situation in 2008 (98 percent). From Table 4, the pupil-to-teacher ratio for primary school rose from 44 percent in 1990 to 58 percent in 2010. The literacy rate was 68 percent in 1999, and the primary school completion rate increased from 65 percent in 1995 to 103 percent in 2010.

Zambia implemented an ambitious process of health sector decentralization in the mid-1990s. In 1991, the government began a new era in health care management, one intended to transform the health care system, with a focus on more affordable care that serves basic needs. The government recognized the need for a new system based on effective, efficient, and affordable standards that used an essential package of cost-effective services, decentralized to the district level. The government introduced user fees in 1993. National exemption guidelines are set for certain diseases, age groups, and services. Districts do have control over the implementation of the exemptions for the poor. Health indicators show some improvements, with mortality rate (under 5) falling from 183 per 1,000 live births in 1990 to 111 in 2010 and life expectancy increasing marginally from 48 to 49 years.

Table 5. Zambia: Education and Health Indicators

	1990	1994	1999	2004	2008	2010
School enrollment, primary (% gross)	96.6	90.8	83.7	107.1	122.0	115.3
School enrollment, primary (% net)	n.a.	76.9	70.5	86.5	97.6	91.4
School enrollment, secondary (% gross)	21.3	20.7	n.a.	n.a.	n.a.	n.a.
School enrollment, secondary (% net)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Literacy rate, adult total (% of people ages 15 and above)	65.0	n.a.	68.0	n.a.	n.a.	n.a.
Primary completion rate, total (% of relevant age group)			65.20	74.59	96.58	103.25
Pupil-teacher ratio, primary	44.0	n.a.	60.9	62.4	60.5	58.0
Pupil-teacher ratio, secondary	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Mortality rate, under-5 (per 1'000 live births)	182.8	180.7	161.3	142.4	121.8	111.0
Life expectancy at birth, total (years)	47.5	44.1	42.0	43.6	47.1	48.5

Source: World Bank, World Development Indicators.

IV. Application of Social Opportunity Function to Selected African Countries

A. Household Surveys

This paper applies the concepts of social opportunity curve, opportunity index, and equity index of opportunity (as described in Section II) to selected SSA countries—Cameroon, Ghana, Mozambique, Tanzania, and Zambia. The choice of countries reflects data availability. Data for these countries were taken from household living-standard surveys for different years.

We obtained demographic, economic, health care, and educational information from a series of surveys for individual members of the household. In particular, information on access to health care services, education enrollment (primary and secondary), and household expenditure were extracted. The paper focuses on two key variables for measuring access to opportunities: education (primary and secondary) and health services.[6] We chose education because it is viewed as critical to promoting social mobility and therefore improving equity. This is the premise on which public sector intervention in the education sector is justified. One can measure by two dimensions whether the education system is indeed serving this end. One is through average access to education by school-age children at a particular time, and over time, requiring the use of social opportunity curve. The other is through distribution of educational opportunities across different socioeconomic and income groups, necessitating the use of the equity index of opportunity. Similarly, access to health was chosen on the premise that access to health services is critical to avoiding economic hardship that could emanate from falling ill, pointing to the criticality of equity in access to health care services, with focus on both average access and the distribution of opportunities.

More importantly, the selection of these two key variables (access to education and health) was influenced by data availability and also coincided with periods of growth acceleration in the selected countries: Cameroon (1996, 2001, 2007); Ghana (1991, 1998, 2005); Mozambique (1996, 2002, 2008); Tanzania (2000 and 2008); and Zambia (1998, 2004, 2010).

[6] We recognize the limitations of this paper, because the focus is on access to education and health, but not on quality. The household survey data used for the analysis do not contain information on the quality of primary and secondary education as well as health services. Thus, data availability does not permit the consideration of such issues using the innovative approach of social opportunity function. However, the issue of improved access to education and health is of utmost importance, given the still low access to secondary school education and health services in some SSA countries.

The paper uses current enrollment status of individuals to define access to education. This is consistent with the International Standard Classification of Education (ISCED 97) methodology. Here the corresponding question in the household surveys is whether an individual in the age bracket is currently attending school. This is used to restrict the population to the official primary and secondary school age. Based on this, a dummy variable is created that takes a value of 0 if a person has no access to education and 1 if a person does have access.[7] We performed a similar exercise to ascertain access to health care services. We estimated access to health "consultation" among the "sick" population by grouping population into those who were sick in the past several weeks and out of this group, identified those who were able to get access to health services if they needed to and those who were not able to gain access. A dummy variable was constructed for access to health care services; it takes on the values of 0 and 1 for no access and access, respectively.

B EMPIRICAL RESULTS

Access to primary school education

The focus is on both average access to and equity of education at the primary level.

Our estimations show upward sloping opportunity curves for primary school enrollment, indicating that in general, primary education opportunities in these selected countries have not been pro-poor. However, within country dynamics show outward shifts of the opportunity curves, an indication of improved access to primary school education in countries under analysis. Our quantitative measure of opportunity indices increased for all the countries, underpinned by both increased average opportunities as well as improvement in the distribution of access to primary school education (Figures 3 and 4).

Figure 4 shows the opportunity curves for all the countries for the period covered. Particular attention needs to be paid to two main points on these opportunity curves. The first one is when the total population is covered (when *p,* on the horizontal axis, equals 1), this is the particular case that the opportunity curve for primary school enrollment coincides with the average access to primary education.

In Cameroon, the average opportunity for the entire population that falls within the age bracket for primary school enrollment, remained virtually unchanged at 84 percent between 1996 and 2001, but increased to 87 percent in 2007. With respect to the equity of access to primary school education, we estimated equity index of opportunity (EI). The EI

[7] The focus is on whether a child has the opportunity of getting enrolled in a primary or secondary school. We have not focused on a situation where the opportunity may exist but there are specific characteristics of a household that prevent the members from taking the available opportunity.

shows a consistent increase, moving from 0.91 in 1996 to 0.95 in 2007, pointing to improvement in equity of access to primary school education.

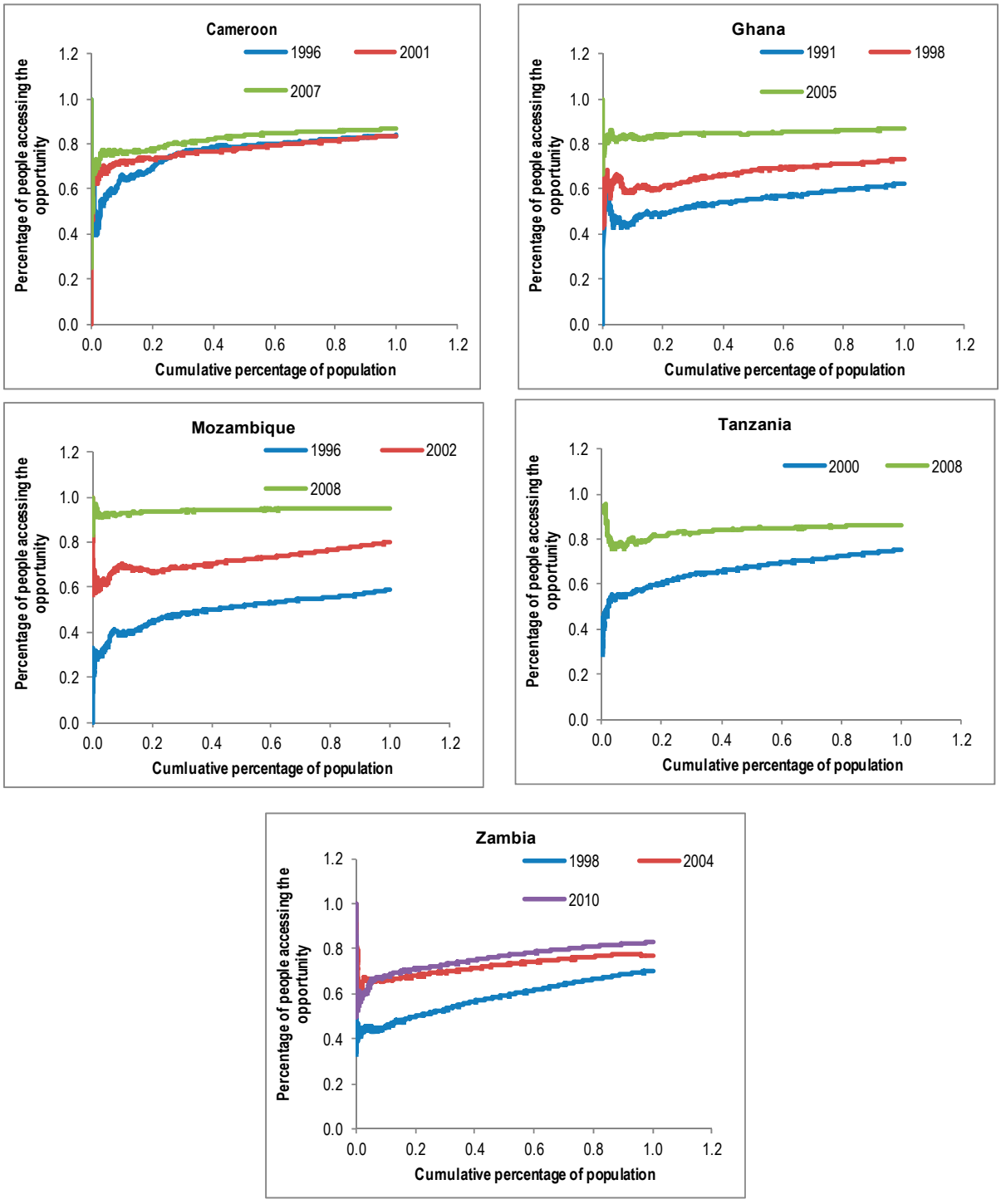
In Ghana, average opportunity increased from 62.5 percent in 1991 to 73.4 percent in 1998 and to 87 percent in 2005. There has been consistent improvement in the distribution of opportunities to access primary school education in Ghana, as evident in the increase of EI from 0.88 in 1991 to 0.91 in 1998 and subsequently to 0.98 in 2005 (Figure 4).

For Mozambique, the average opportunity increased from 59 percent in 1996 to 80 percent in 2002 and further to 95 percent in 2008. The equity index of opportunities improved from 0.84 in 1996 to 0.90 in 2002 and further to 0.99 in 2008.

Tanzania shows an improvement in access to primary education between 2000 and 2008. The average opportunity increased from 75 percent in 2000 to about 86 percent in 2008. We observe an improvement in distribution of opportunities to access primary school education, as reflected in the increase of EI from 0.88 in 2000 to 0.97 in 2008.

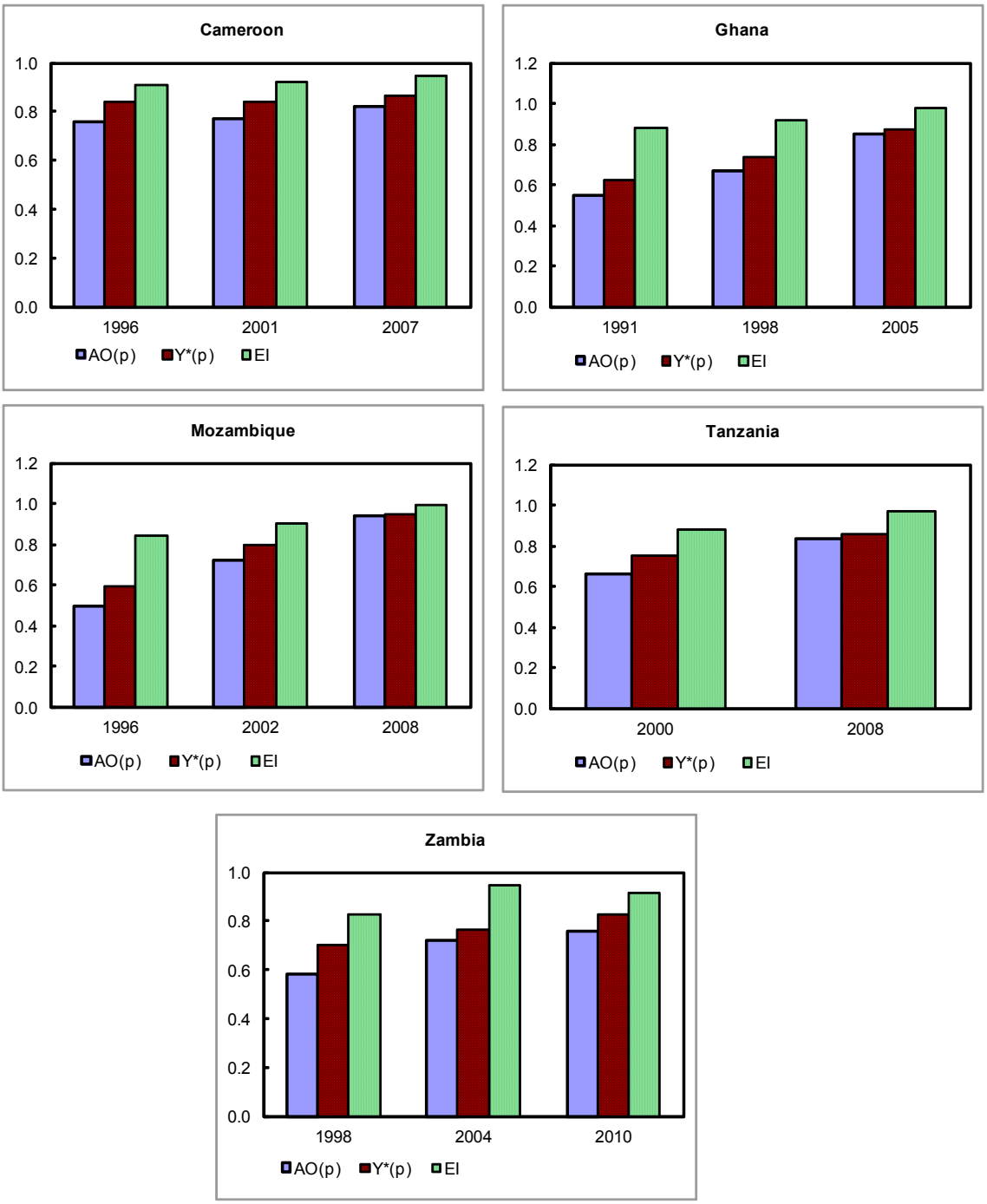
In **Zambia**, the average opportunity in primary education increased from 70 percent in 1998 to 83 percent in 2010. Regarding the equity of access to primary school education, the EI shows an increase from 0.83 in 1998 to 0.94 in 2007. However, the EI fell to 0.91 in 2010.

Figure 3. Social Opportunity Curves for primary School Enrollment



Source: Calculated by the authors.

Figure 4. Opportunity and Equity Index: Primary School Enrollment



Source: Calculated by the authors.

Access to secondary school education

Similar to trends in primary education, the opportunity curves for secondary education for all countries across all years are also upward sloping; implying the distribution of access to secondary education could be considered non-pro-poor (Figure 5). We also observe that, the averages for secondary education are lower across all countries compared to primary education access. On average—for all five countries—access is around 50 percent. There has also been a general improvement in the equality of access to secondary school education in countries under analysis.

- **In Cameroon**, the average opportunity increased from 39 percent in 1996 to 52 percent in 2007. This was accompanied by consistent improvement in the distribution of access, with EI increasing from 0.67 in 1996 to 0.71 in 2001 and further to 0.77 in 2007.

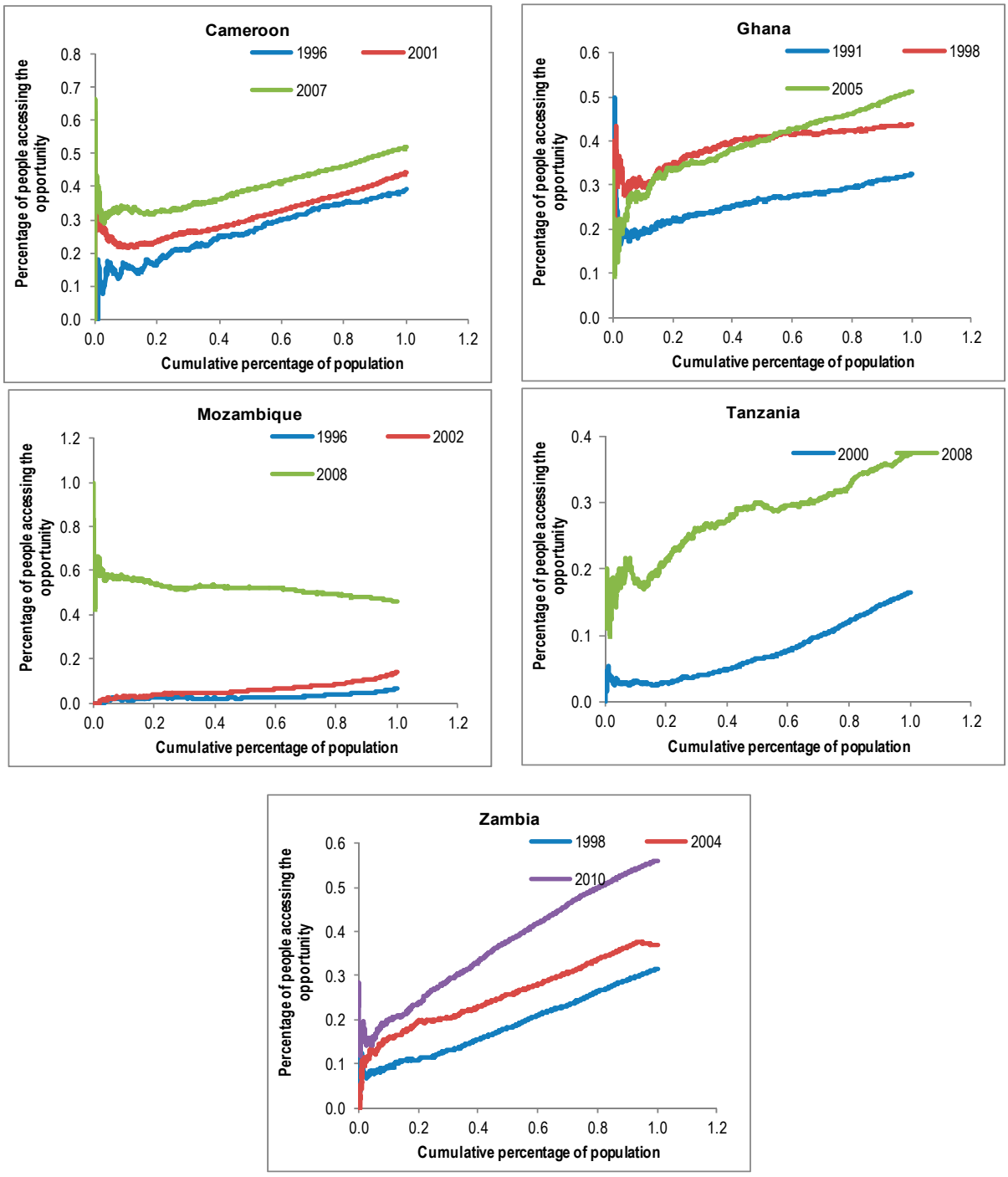
- **In Ghana**, average opportunity for secondary school education increased from 32 percent in 1991 to 51 percent in 2005. Regarding equality of access, the EI increased from 0.80 in 1991 to 0.89 in 2004, but fell to 0.77 in 2005.

- **In Mozambique**, the average opportunity for secondary education increased from about 7 percent in 1996 to 46 percent in 2008. This has been accompanied by significant improvement in the distribution of access, with EI improving from 0.42 to 1.13 in the same period.

- **In Tanzania,** access to secondary education improved, as seen in the increase of average opportunity from 17 percent in 2000 to 37 percent in 2008. During the same period, the equity index of opportunity increased from 0.45 to 0.74.

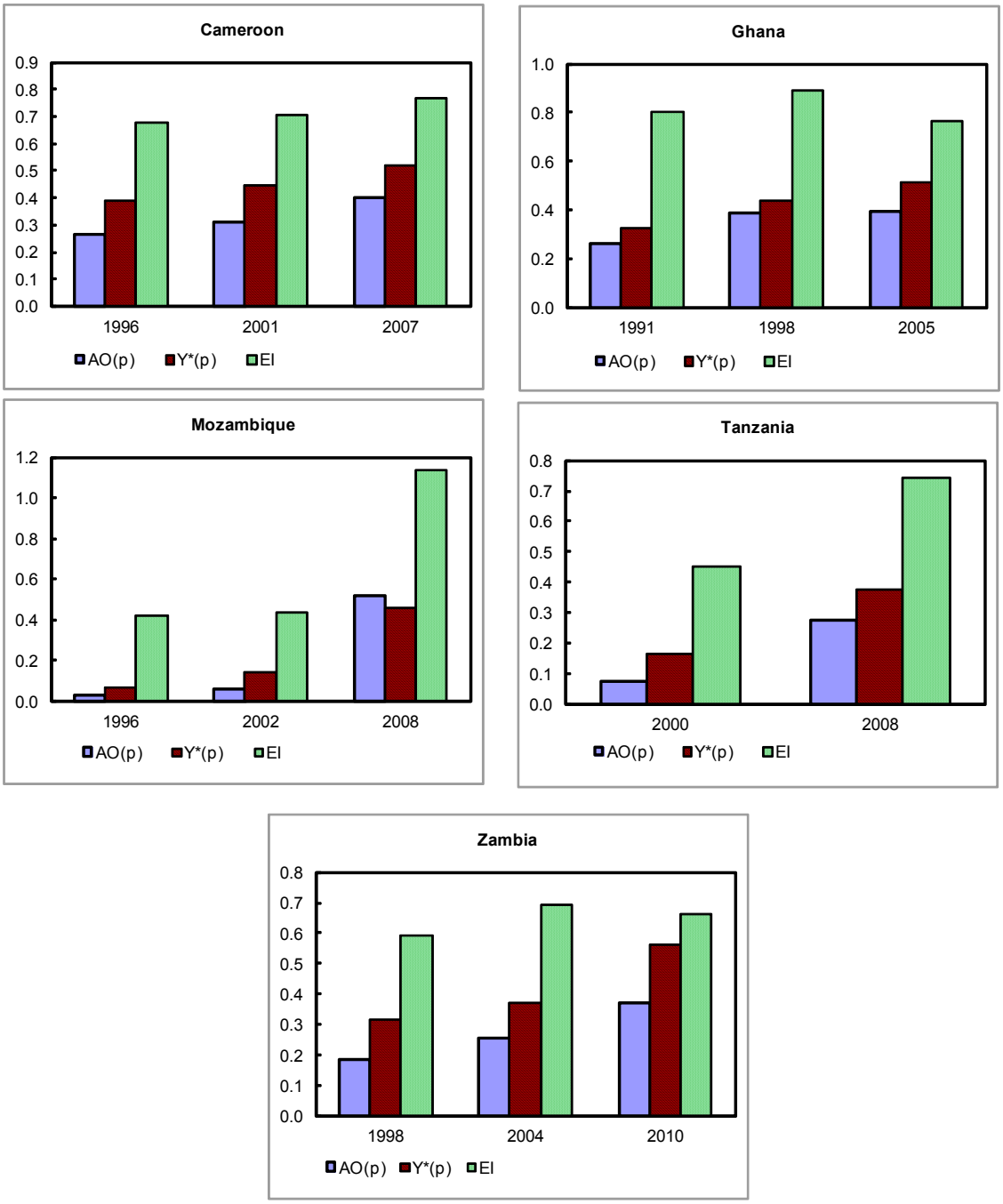
- In **Zambia**, the average opportunity increased from 32 percent in 1998 to 56 percent in 2008. This was associated with an improvement in the distribution of access, with EI increasing from 0.59 to 0.67 in the same period.

Figure 5. Social Opportunity Curves for Secondary School Enrollment



Source: Calculated by the authors.

Figure 6. Opportunity and Equity Index: Secondary School Enrollment



Source: Calculated by the authors.

Access to health services

The general trend has been one of improvement in access to health care services. The key result is that the improved opportunity index for health care services was underpinned by a combination of an increase in average opportunity and improved distribution. The findings for each of the countries are discussed below:

- **In Cameroon**, the average opportunity increased from 60 percent in 1996 to 88 percent in 2001. However, a more recent survey shows deterioration in access in 2007 to 77 percent. We see an improvement in the equality of access, as shown in the increase in EI from 0.81 to 0.94 between 1996 and 2001. However, EI fell to 0.92 in 2007.

- **In Ghana**, average opportunity for health services fell from 55 percent in 1991 to 49 percent in 1998, but recovered to about 57 percent in 2005. The equity index shows a similar pattern, falling from 0.85 in 1991 to 0.81 in 1998 and improving to 0.89 in 2005.

- **In Mozambique**, the average opportunity shows a consistent improvement, increasing from 65 percent in 1996 to 74 percent in 2002 and further to 77 percent in 2008. Although the equity index of opportunity fell from 0.96 in 1996 to 0.85 in 2002, it increased to 0.95 in 2008.

- In **Tanzania,** the average opportunity increased from 86 percent in 2000 to 93 percent in 2008, and the equity index improved from 0.92 to 0.93 in the same period.

- **Zambia's** data show consistent improvement in average opportunity, increasing from 59 percent in 1998 to 77 percent in 2004 and further to 82 percent in 2010. The equity index of opportunity increased from 0.84 in 1998 to 0.94 in 2004 and further to 0.98 in 2010.

Figure 7. Social Opportunity Curves for Access to Health Services

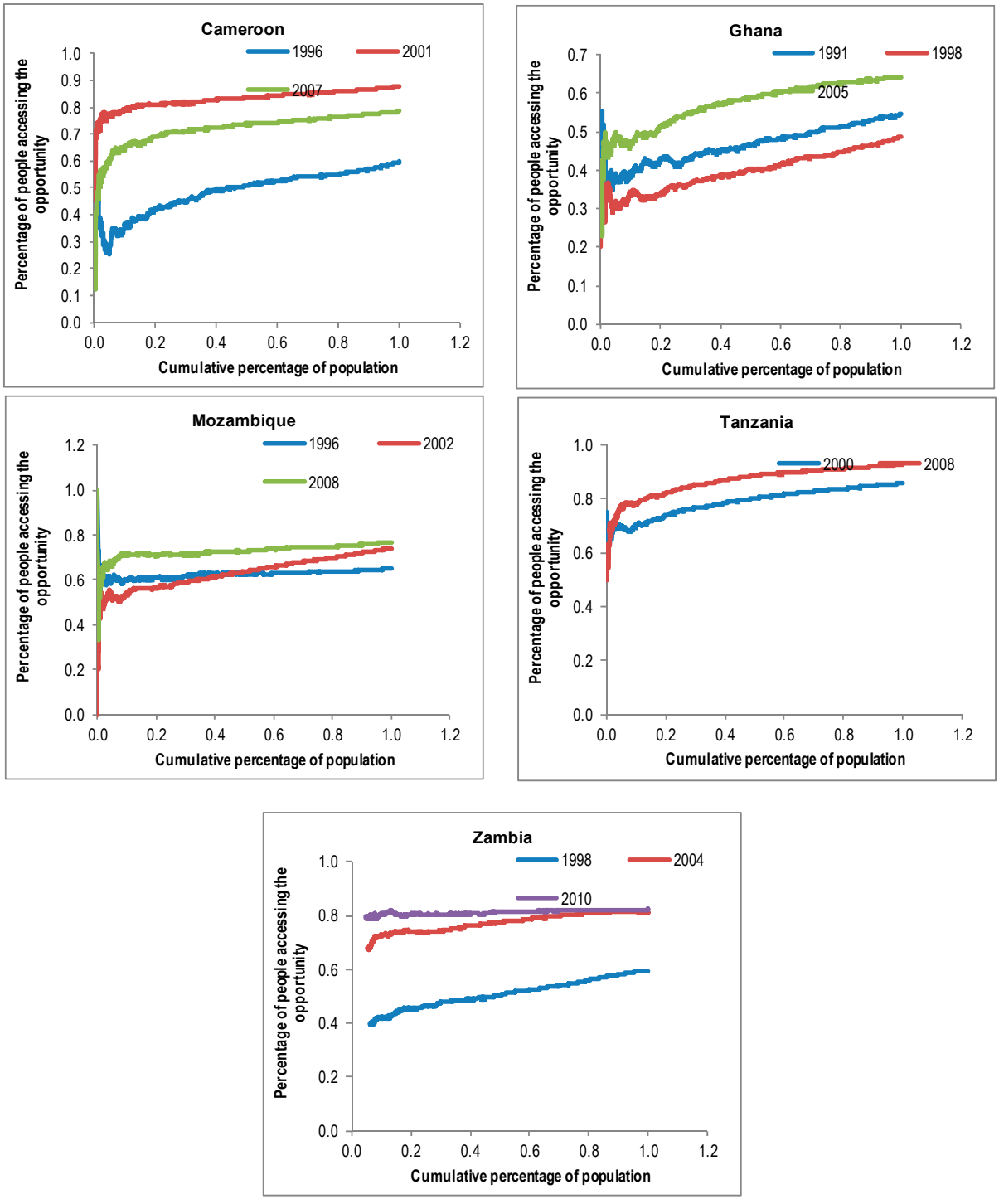
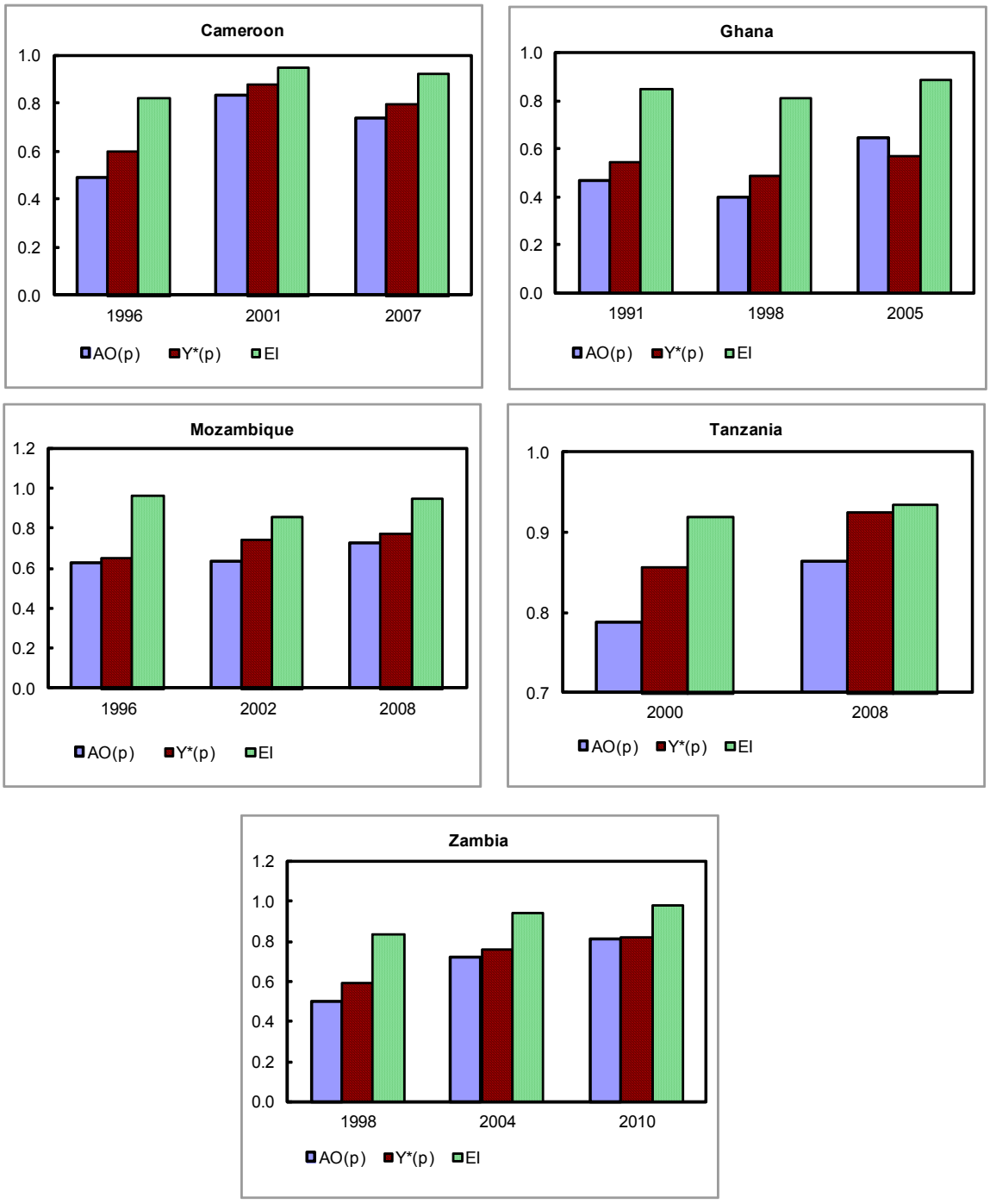


Figure 8. Opportunity and Equity Index: Access to Health Services



Source: Calculated by the authors.

V. CONCLUSIONS

This paper adopts a new approach to measuring inclusive growth. Similar to the concept of a social welfare function, the framework of social opportunity function is used in this paper. Social opportunity function depends on average opportunities available to the population and how opportunities are distributed. We have used the opportunity curve, which has a one-to-one relationship with the social opportunity function. Empirical applications to five African countries presented in the paper show that the opportunity curve is a useful device to analyze the inclusiveness of growth in quantitative terms.

A more important 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. The degree of growth inclusiveness will depend on how much the curve shifts upward and in which part of the income distribution the shift takes place. This dynamic analysis allows for monitoring the inclusiveness of growth over time for an individual country. This paper offers a complementary approach to analyzing the inclusiveness of growth through the application of growth incidence curves. Aside from the use of opportunity curves, which has some resemblance to the growth incidence curves, the paper also creates an equity index of opportunity that measures equity in access to education and health services.

By applying the social opportunity functions to assessing the inclusiveness of growth in selected SSA economies that have experienced growth episodes in the last decade, we establish that periods of growth also coincided with periods of increased access (or opportunities). This result corroborates the findings in Garcia-Verdu, Selasse, and Thomas (2011). We are also able to establish that average access and distribution have increased across all these countries over time—an increase of opportunities for education and health.

We are able to establish that while average access increased across countries more generally, equity in the distribution of this access has varied across countries. This has mostly moved in line with different country-specific policies. Significant progress has been made in primary school education enrollment, while enrollment for secondary school education remains low. The performance in the health sector has not been as strong as in education. In all the countries analyzed, using the social opportunity function concept, improvements in both average access to health and distribution have, at best, been marginal in the last decade. These empirical results bring out important aspects of the provision of public services in education and health in the countries under analysis, especially the criticality of effective design and implementation of education and health services that will meet the needs of the poor segment of the population, which is important to sustaining reforms and growth momentum.

The study shows that achieving overall growth is necessary but not sufficient for making that growth inclusive. A concerted effort by governments is needed to target resources toward sectors that impact the poor the most, by creating opportunities and access for the poorer segment of the population to participate in the growth process. Growth without access to health and skills (education) to participate in income generation activities, in the long run, will not be inclusive. Increased inequality may shorten growth duration, and poorly designed efforts to lower inequality could grossly distort incentives and thereby undermine growth, hurting even the poor. This suggests scope for "win-win" effective policies and interventions, such as better-targeted subsidies, improved economic opportunities for the poor, and active labor market policies that promote employment. Policies targeting income inequalities at the source (for example, through early investments in human capital for the poor) could contribute to reducing inequalities. Policies geared toward the provision of health and education services can be effective to reduce inequalities and increase growth.

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