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Is Africa on Track to Ending Poverty by 2030?

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Abstract

Progress in poverty reduction has been slow for the Sub-Saharan Africa region which faces serious challenges in addressing inclusive growth. This study assesses the income growth requirements to achieve the sustainable development goals on poverty for given income inequality performances in African countries. The assessment is based on a microeconomic approach and survey data for the countries. Results reveal that, given their current income growth and inequality performances, more than half (55%) of the African countries are off track to halving poverty between 2015 and 2030. Therefore, under the current inequality reduction performances, African countries should strive to deliver higher income growth results, above 6% annual gross domestic product on average, to be on track to achieving the Sustainable Development Goals target of halving poverty between 2015 and 2030.

Keywords: poverty, inequality, growth, sustainable development goals, Africa
JEL classification: I32, O4; O55

1. Introduction

Poverty has remained relatively higher for most Sub-Saharan African (SSA) countries than for other similar developing countries in other regions in the world (Beegle and Christiaensen, 2019). Evidence suggests that progress in poverty reduction has been slow for Africa, particularly for SSA, while most Asian economies have experienced enormous reduction in poverty (Hamel *et al.*, 2019). Africa is the second most unequal continent and home to seven of the most unequal countries (Shimeles and Nabassaga, 2018). Both poverty and extreme poverty in SSA are high and have recently been on the increase (Jirasavetakul and Lakner, 2020). High poverty and extreme poverty disproportionately affect the rural population and the bottom 40% of the population. There are widespread socio-economic inequalities between the poor and the rich in Africa.

The point of departure for this study is the question on SSA's progress towards achieving the United Nations 2030 agenda for sustainable development, which consists of 17 sustainable development goals (SDGs), with the first goal aiming at ending poverty in all its forms everywhere (UN, 2015a). Although poverty has multiple dimensions, i.e., monetary and non-monetary, the focus of this study is on the monetary dimension of poverty. Monetary poverty can be measured as having a daily income of less than $1.90 in 2011 purchasing power parity (PPP), i.e., the international poverty line. Monetary poverty captures the capacity of households to meet their basic needs in food, housing, clothing and other goods and services (Lakner *et al.,* 2018). Tackling monetary poverty will most likely positively affect other dimensions of poverty, such as education and health.

Consensus has emerged that growth is essential to poverty reduction (Deininger and Squire, 1996; Dollar and Kraay, 2002; Bourguignon, 2003). More recently, Thorbecke (2013) highlighted that challenges in achieving poverty reduction in Africa, and particularly in SSA, can be attributed to a combination of prevalent poverty, high inequality and low growth. How much growth reduces poverty depends on the rate of economic growth itself, the initial inequality and the change in inequality (Adams, 2004; Bourguignon, 2004a; Fosu, 2017). Evidence has shown that higher income inequality hinders the transformation of growth into poverty reduction. In other words, higher income inequality is associated with lower growth elasticity of poverty (Ravallion and Chen, 1997; Fosu, 2017). The extent and intensity to which a given country should pursue one or the other strategy depends on many factors, including the ability to accelerate and sustain economic growth. In some circumstances, the long-term growth rate required for a given country to achieve the SDG on poverty is out of reach. Indeed, the prevailing economic structure and capacity to sustain the required growth rate differs and matters for countries. An adequate combination of growth and inequality reduction strategies is needed to achieve the poverty reduction goals within a given context and time horizon. Thus, this raises an important question on what is the minimum growth rate target, given the prevailing inequality, required for a country to meet the poverty reduction target of the SDGs? While there may be many possible scenarios, in general, the literature does not pronounce on possible mixes of growth and inequality required to reduce poverty to the level targeted for 2030 in the SDGs. Yet, such evidence can offer valuable information to countries in terms of prioritisation, policy focus and effort to achieve the SDG on poverty.

This paper seeks to answer the question posed above with a view to assisting African countries to monitor and develop more effective strategies for poverty reduction. To achieve this objective, we begin by assessing the growth targets that would lead to halving poverty within a 15-year period, given initial poverty, inequality and relative income levels. We then gauge African countries' current profile and performance against the initially estimated growth target. This is with the intent of determining if they are on or off track to achieving the SDG of halving poverty between 2015 and 2030.

The rest of the paper is arranged as follows. Section 2 discusses the progress and challenges regarding poverty reduction in Africa, while section 3 provides a brief literature review on poverty, economic growth and redistribution nexus. Section 4 discusses the methodology and section 5 presents the results and a discussion of the findings. Section 6 concludes the paper.

2. Poverty reduction in Africa: Progress and challenges

In 2000, world leaders committed to a global vision to '*spare no effort to free our fellow men, women and children from the abject and dehumanizing conditions of extreme poverty*' (UN, 2015b:3). The global mobilisation, known as the Millennium Development Goals (MDG), comprised of eight goals targeted at eradicating poverty by 2015. While this

Table 1. Poverty headcount and poverty headcount ratio for SSA

Year	Poverty headcount ratio at $1.90 a day (2011 PPP) (%)	Poverty headcount at $1.90 a day (2011 PPP) in millions	GDP per capita, PPP (constant 2011 international $)
1990	54.3	277.6	2648
1993	58.4	324.8	2431
1996	57.7	347.7	2463
1999	57.1	372.6	2474
2002	55.6	392.4	263.2
2005	50.0	382.7	2877
2008	47.0	390.4	3173
2010	45.7	400.6	3292
2011	44.1	397.2	3352
2012	42.6	394.7	3398
2013	41.0	390.3	3842

Source: Addison *et al.*, 2017 and WDI database (Word Bank, 2019).

vision was embraced by all, with concerted efforts by governments to achieve the targets; it was apparent, by the end of 2015, that developing regions, such as Africa, would not be able to meet the poverty reduction targets. A final report published by the United Nations summarised the successes (refer to Annexed Table A.1) and remaining challenges of attaining the MDGs (UN, 2015b). Although some African countries were on track to meet the target of halving poverty by 2015, poverty and hunger remained high on the continent. For instance, recent estimates suggest that the percentage of Africans who are living in extreme poverty has dropped considerably from about 54% in 1990 to 41% in 2015 (Beegle and Christiaensen, 2019). However, the number of people who are poor has actually increased from 278 million in 1990 to 413 million in 2015 because of population growth during the same period. It is further projected that the extremely poor people will be increasingly concentrated in Africa (Beegle *et al.*, 2016; Beegle and Christiaensen, 2019). Similarly, SSA reduced poverty levels from an average of 58% in the 1990s to approximately 35% in 2015, which is still high compared with the developing country average of about 12% and the world average of 9.6% (Castañela *et al.*, 2016). Poverty trends in SSA show that out of over 700 million people globally who lived in extreme poverty in 2015, a considerable proportion are in the SSA region (Castañela *et al.*, 2016). A forecast by the World Bank also reveals that approximately 9 in 10 extremely poor people will live in SSA by 2030 (Wadhwa, 2018).

The United Nations post-2015 agenda continued with the drive to improve the overall quality of life globally through the SDGs. As reflected in the SDGs, growth, poverty and income distribution have increasingly become an issue of global concern (UN, 2015a). Three of the 17 SDGs focus directly on growth, poverty, inequality and redistribution (SDGs 1, 8 and 10). The first SDG calls for ending poverty by 2030. This goal includes ending extreme poverty (i.e., at international poverty line or $1.90 a day purchasing power parity) by 2030 and halving poverty at national poverty line between 2015 and 2030 (UN, 2015b).

Table 1 presents trends in poverty headcount, poverty headcount ratio and GDP per capita in SSA over the last several years. We observe that poverty headcount ratio/index, measured at both national and international lines, has declined relatively over time. However, the incidence of poverty/poverty headcount increased considerably over time, peaked in 2013 with about 390 million people living in poverty. The result further suggests that during that period, SSA faced the paradox of having modest growth in GDP per capita but rising numbers of people living in poverty as shown in Table 1 (Addison *et al.*, 2017).

Table 2. Poverty Headcount Ratio at National and International Poverty Lines, 2010–2017 (Percent)

Country	Poverty headcount ratio ($1.90 2011PPP)	Poverty headcount ratio at national poverty line
Angola	30	37
Burkina_Faso	44	40
Burundi	77	65
Cameroon	29	38
Cote d'Ivoire	24	46
Congo, DRC	76	64
Ethiopia	37	24
Ghana	12	24
Kenya	43	36
Lesotho	62	50
Madagascar	82	71
Malawi	68	51
Mali	49	41
Mauritania	20	31
Mozambique	68	46
Niger	37	45
Nigeria	55	46
Rwanda	67	39
Senegal	38	47
South Africa	14	56
South Sudan	43	66
Tanzania	42	28
Uganda	34	20
Zambia	60	55

Source: Azzarri and Signorelli (2020) and WDI database (Word Bank, 2019).

Table 2 presents the poverty headcount ratio measured at both international and national poverty lines of 24 selected African countries. A close look at individual countries reveals that 18 countries (about 75% of the sample) have a poverty headcount ratio, measured at the international poverty line, of 30% or above. The number of countries with a poverty headcount index above the threshold of 30% reaches 20 (about 83%) when the poverty headcount ratio is measured at the national poverty lines. The implication is that even though poverty has declined over the last two decades, the level of poverty remains relatively high in SSA. The results further suggest that poverty reduction has been driven by both income growth and inequality reduction over the past two decades. Indeed, empirical evaluation of available data in the region by Arndt *et al.* (2016) suggests that in terms of both monetary and non-monetary indicators, living conditions in the region have improved over the period of re-instituted growth. However, the authors concluded that poverty levels and inequality still remain high in SSA compared with other regions in the world.

3. Poverty, growth and inequality nexus: Review of evidences

The growth–inequality–poverty nexus is embedded in the various theories of income distribution (Bourguignon, 2004). These theories provide strong evidence that the change in poverty is related to the change in the mean income growth of the population and the change in the distribution of income within the population. Thus, both income growth and income distribution are important to achieving the goal of poverty reduction.

Several empirical studies have established a link between economic growth and poverty reduction. According to Lin (2003), the rapid economic growth experienced in China

between 1985 and 2001 contributed significantly to the decrease in poverty. Similarly, the decrease in poverty incidence in India was on the back of accelerated growth rates in the 1990s (Bhanumurthy and Mitra, 2004). Further consensus that growth is essential to poverty reduction is also found in Deininger and Squire (1996); Dollar and Kraay (2002) and Bourguignon (2003). Thorbecke and Ouyang (2017) examined the evolution of growth in SSA and compare it with growth in the developing economies between the early 1980s and early 2010s. The authors estimate both the well-researched growth–inequality–poverty nexus as well as the reverse causality determining the poverty–inequality–growth nexus (Thorbecke and Ouyang, 2017:24) and find that poverty reduction post-2007 is highly sensitive to income growth and progress in inequality reduction. With regards to the growth–inequality–poverty nexus, the authors conclude that economic growth was substantially faster in SSA countries whose initial level of poverty was higher, implying poverty convergence (Thorbecke and Ouyang, 2017:24).

It is worthy of note that the extent to which growth reduces poverty does not only depend on the rate of economic growth itself, but also on the extent of inequality (Ravallion and Chen, 1997; Adams, 2004). Ravallion and Chen (1997) find that while growth reduces poverty, the effects do not necessarily spill over into reducing inequality. Moreover, Bruno *et al.* (1998) estimated the effect of changes in growth and inequality on changes in poverty and obtain statistically significant coefficients of −2.28 for the growth variable and 3.86 for the inequality variable, suggesting that income inequality exacerbates poverty. Besley and Cord (2007) also find that the proportion of poor people in Uganda would have been much lower had growth not widened the income distribution between 1992 and 2002. Higher income inequality is, therefore, associated with lower growth elasticity of poverty. Berg *et al.* (2018) investigate the relationship between inequality, redistribution and growth using a data set that separates between market (pre-tax and transfer) and net (post tax and transfer) inequality and allows the calculation of redistributive transfers for a large number of advanced and developing countries. They find that when controlling for redistribution, lower net inequality is robustly correlated with faster and more durable growth. Moreover, there is a positive link between redistribution and economic growth, and the clearest channels through which inequality affects growth seem to be human capital accumulation and fertility (Berg *et al.*, 2018:292).

A country's initial income level matters in the transformation of growth to poverty reduction. Fosu (2017) attributes the low responsiveness of poverty to income growth to low income levels. For instance, Burkina Faso's inability to reduce their level of poverty, although their inequality was lower than Chile's, was compounded by the country's relative low income (Fosu, 2017).

The aforementioned empirical studies highlight the ambiguous relationship between poverty, inequality and economic growth. The ambiguity was also captured in the theoretical framework of poverty, growth and inequality triangle, which was advanced by Bourguignon (2004). Bourguignon (2004) reiterated that a recurring issue in most poverty reduction agendas is whether the key development strategy should depend solely on growth, or poverty and inequality or either of them. He maintained that the real issue in developing a viable pathway targeted at reducing poverty should lie in establishing the relationship and interdependence between economic growth and income distubution. However, Arndt *et al.* (2016) argued that Bourguignon's poverty, growth and inequality triangle assertion might not hold absolutely true for most African countries, where high poverty rates among a substantial proportion of the population are attributed mostly to macroeconomic issues and highly skewed income distribution rather than economic growth.

Moreover, Chambers and Dhongde (2011) opine that the ambiguity is also brought about by the fact that the poverty–inequality–growth functional form is assumed to be known, which is not necessarily the case. Decomposition of poverty changes requires data on the distribution of income which limits analysis to changes in poverty for countries where such

data are available. Without detailed data on the distribution of income, the partial growth elasticity of poverty is estimated by regressing the change in poverty on changes in average incomes controlling for changes in the Gini index (Chambers and Dhongde, 2011). The observation from these authors is that the percent reduction in poverty due to growth is determined not only by the mean but also by the distribution of income, emphasises more a non-linear relationship between poverty, income growth and inequality (Chambers and Dhongde, 2011). Linear regression models may therefore not be appropriate and efficient estimation models. In this case, where this functional form is unknown, Chambers and Dhongde (2011) recommend using non-parametric methods. Following Chambers and Dhongde (2011) observation, by using a microsimulation technique, this study aims at assessing the income growth targets required for Sub-Saharan African countries to achieve the SDG on poverty.

4. Methodology

We use a three-step approach to conduct the analysis. Firstly, we assess the growth targets that lead to halving poverty within a 15-year period, given initial poverty and inequality levels, and relative income level. This assessment relies on a reweighting microsimulation technique and uses the sample of 24 survey data of selected African countries. Secondly, a clustering technique is used to group countries based on two criteria: the initial inequality level measured by the Gini index and the initial ratio of average income to poverty line. Thus, 12 clusters were identified and defined by three elements: i) inequality level, ii) relative income level and iii) income growth target to halving poverty between 2015 and 2030. Thirdly, data on African countries current profile (inequality and relative income levels) and performance (income growth) are gathered and assessed against the initially estimated growth target. When the country's observed growth performance is below (above) the assessed average growth target of its cluster, the country is off (on) track to achieving the SDG on poverty.

Microsimulation models are designed to predict individuals' reactions to a policy shock when facing different economic and institutional environments or constraints. There are multiple approaches to conducting a microsimulation and the choice among these approaches depends on data availability, the research question and time constraints (Cockburn *et al.*, 2012). In terms of the modeling of individual behavior responses, microsimulation models can be grouped into parametric behavioral approaches (e.g. Bourguignon and Spadaro, 2006) and non-parametric approaches (e.g. Vos and Sánchez, 2010). Parametric behavioral approaches include parameters estimated from survey data using econometric techniques. Non-parametric approaches are applied to labor market participation and distribution of earnings using a randomised process to determine the resulting change in labor force status.

The reweighting technique pioneered by Meagher (1993) is another approach used to implement a microsimulation. The technique is latter applied, among others, by Devarajan *et al.* (2002) in Zambia, Ferreira and Horridge (2006) in Brazil, Herault (2010) and Fofana *et al.* (2018) in South Africa. The principle of entropy is often used to transform available aggregate data into a distribution of probabilities describing our state of knowledge. The approach is built upon the Kullback–Leibler minimum divergence cross-entropy (CE) principle to recover a final (posteriori) probability distribution consistent with a new set of aggregate restrictions and an initial (prior) probability distribution. The probability associated with each individual income is expressed through weights assigned to each surveyed individual. Economic shocks are simulated by adjusting individual-level weights, implying a change in income distribution at the population level. Thus, the approach implicitly includes individuals' behavioral change as they move from one income level to

another. It captures aggregate outcomes from individuals' income changes but does not produce individual-level information on transition to a different income level. Therefore, the approach is unable to identify the winners and losers of a macro shock (Herault, 2010). Herault (2010:35) compared results from the parametric behavioral approach and the reweighting approach applied in South Africa. The two approaches provided similar findings, although the reweighting approach tends to introduce a *'small bias in the results without modifying the main conclusions'* (Herault, 2010:35).

The objective function of the Kullbak-Leibler CE problem is stated in a deterministic form. It minimizes the distance (K) between the survey distribution of income across the population (or the prior distribution q) and the ideal distribution of income to achieve the poverty reduction goal (or the posterior distribution p).

$$K = \sum\nolimits_i p_i \bullet \log \frac{p_i}{q_i}$$

The above objective function is subject to a set of aggregate socioeconomic restrictions Y; including the income inequality level and the poverty head count index; y is a parameter associated to an individual specific attribute.

$$Y_j = \sum\nolimits_i y_{j,i} \bullet p_i$$

Finally, the adding up constraint is given by

$$\sum\nolimits_i p_i = 1$$

Income is measured by the per capita consumption expenditure contained in the survey data. Income inequality across the population is measured by the Gini coefficient. The latter is derived from the Lorenz curve and ranges from 0 (perfect equality) to 1 (perfect inequality). The Lorenz curve depicts the cumulative proportion of income earned by the cumulative proportion of the population when the latter is sorted from the poorest to the richest. The poverty assessment uses the Foster-Greer-Thorbecke (FGT) family of poverty measures and, more precisely, the head count poverty, i.e., the proportion of the population with incomes lower than the $1.90 a day at 2011 PPP or international poverty line.

As indicated earlier, this study uses a sample of survey data, i.e., income and expenditure surveys of selected African countries gathered over the last two decades. A total number of 24 survey databases are used; i.e., more than one survey being used for some countries (refer to Annexed Table A.2). The use of survey data allows us to account for countries' initial conditions such as the income levels, income inequality measures, poverty indexes and urbanisation levels.

The microsimulation approach is implemented using the survey data. For each country and data set, the required income growth to halve poverty between 2015 and 2030 (SDG 1) is generated given the initial structure of the data, i.e., the initial inequality and income level. During the simulation, inequality reduction measured by the Gini index is set to follow the historical trend (Table 1) while compensatory income growth is assessed to close the gap of achieving the poverty reduction goal. Although we acknowledge the importance of income inequality reduction strategies to achieving the poverty reduction goals within a given time horizon, the focus of this paper is on the income growth option.

Table 3. Per Capita Income Growth Targets to Halving Poverty Between 2015 and 2030, Percent Annual Average

		Initial Gini Index		
		Less than 0.4	**Between 0.4 and 0.5**	**More than 0.5**
Initial Relative Income Level	Less than 1	2.2	2.3	3.9
	Between 1 and 2	1.4	2.1	3.0
	Between 2 and 3	0.9	1.2	2.6
	More than 3	0.3	0.6	1.5

Source: Simulation results.

5. Results and discussions

This section examines the relationship between income growth and initial income and inequality levels resulting from the microsimulation implementation. Furthermore, it maps African countries' income growth performances against their income growth target to achieve the SDG on poverty.

As pointed out earlier, to investigate the relationship between the simulated income growth and initial income and inequality levels, a clustering technique is used to group countries based on the initial Gini index value and the initial ratio of average income to poverty line value (Table 3). Firstly, countries are classified into three categories based on the Gini index. The first group includes low inequality countries with Gini index values less than 0.4. The middle group countries are those with moderate inequality levels with Gini index values ranging from 0.4 and 0.5. The last group includes high inequality countries with Gini index values more than 0.5. The first and second groups account for 38% and 43% of survey data, respectively, while the high inequality group account for 19% (refer to Annexed Table A.3). Secondly, countries are classified into four income categories regardless of the first grouping. The first group shows low relative income levels, i.e., the ratio of average income to poverty line of less than 1. The last group of countries shows high relative income levels of more than 3. The second and third groups value are between 1 and 2, and 2 and 3, respectively. The first and fourth groups include 70% and 23% of survey data, respectively (refer to Annexed Table A.3).

The income growth target is strongly associated with the initial income level. The higher the initial income level, the lower the income growth requirement, regardless of the initial inequality level (Table 3). The income growth target is conversely strongly associated with the initial inequality level, i.e., the higher is the initial inequality level then the higher is the income growth requirement regardless of the initial income level (Table 3). Thus, in line with empirical findings, these results suggest that both initial inequality and income levels are strongly related with income growth and poverty reduction in Africa.

Countries with high-income levels can achieve the poverty reduction goal through income growth only, i.e., without requiring a reduction in income inequality (Table 4). However, the income growth targets should not be pursued at the expense of increase in income inequality in these countries. On the contrary, countries with lower income levels must combine income growth with income inequality reduction to meet the poverty reduction target. They should, at least, sustain the historical trend in income inequality reduction while accelerating income growth.

The simulated income growth targets in Table 3 present the minimum growth requirements to halve poverty between 2015 and 2030 under the historical trend in income inequality reduction (Table 4). An annual average per capita income growth of around 0.3% is required for countries with low inequality level (below 0.4) and high relative income growth level, i.e., ratio of average income to poverty line (above 3). In contrast,

Table 4. Income Inequality Reduction Targets to Halving Poverty Between 2015 and 2030, percent

		Initial Gini Index		
		Less than 0.4	**Between 0.4 and 0.5**	**More than 0.5**
Initial Relative Income Level	Less than 1	−5.2	−2.7	−4.2
	Between 1 and 2	−1.7	−2.3	−4.0
	Between 2 and 3	−0.6	−0.7	−0.9
	More than 3	−0.1	−0.1	−0.3

Source: Simulation results.

an annual average per capita income growth of around 3.9% is required for countries with high inequality levels (above 0.5) and low income growth levels (below 1).

The next step of the analysis consists in collecting recent data for almost all African countries to map their profile and income growth performances against their income growth target (Figure 1). In Figure 1, countries with strong prerequisites, i.e., an initial mix of low inequality level and high relative income level, are depicted on the left-side. These countries require low income growth rates to halving poverty between 2015 and 2030. In contrast, countries with weak prerequisites, i.e., an initial mix of high inequality level and low income level, are depicted on the right-side of Figure 1. This group of countries requires high income growth rates to halve poverty between 2015 and 2030. Thus, the required minimum income growth target to be on track to achieving the SDG 1 is depicted by the upward slope curve in Figure 1. When the country projected income growth is lower than the target, it appears below the curve, i.e., it is off track to achieving the SDG 1. On the contrary, when the country is above the curve, its income growth performance is higher than the minimum requirement or target, and in this case, the country is qualified to be on track to achiving the SDG 1. Countries' initial conditions, i.e., most recent Gini index and relative income level[1] are collected from the World Bank's World Development database (refer to Annexed Table A.3). African countries' income growth performances are measured by the per capita GDP growth data gathered from the IMF's World Economic Outlook database for a 10-year period, i.e., from 2015 to 2024 (IMF, 2019). The latter includes estimates over 2015–2017 and projection over 2018–2024. Thus, a ten-year (2015 to 2024) annual average growth rate is computed for individual countries (refer to Annexed Table A.4). Countries' initial conditions and income growth performances measured by the per capita GDP growth are mapped against the income growth targets measured by the household final consumption expenditure (Figure 1). Per capita GDP growth is strongly correlated with household final consumption expenditure as depicted in Annexed Figure A.1.

The mapping depicted in Figure 1, indicates that more than half (55%) of African countries are off track to halving poverty between 2015 and 2030[2]. These countries show an average income growth, measured by GDP per capita, of around 2% over the period 2015–2024. This growth performance is insufficient with regards to the countries' prerequisites, i.e., high-income inequality and low income level, on the one hand, and the historical trend in income inequality reduction, on the other hand. However, countries with strong prerequisites, such as Tunisia and Botswana, are on track with a per capita income growth rate around 2%; while countries with very weak prerequisites such as Guinea Bissau and Central African Republic are off track with per capita income growth rate between 2% and 3% (for further details, please see Annex Tables A.5, A.6 and A.7).

[1] Relative income is measured by the ratio of GDP per capita to international poverty line. The international poverty line is set at $1.90 a day. GDP per capita and international poverty line are both measured at constant 2011 international dollar or PPP.

[2] Annexed Tables A.4, A.5 and A.6 give more details on the results for countries that are on track and off tack.

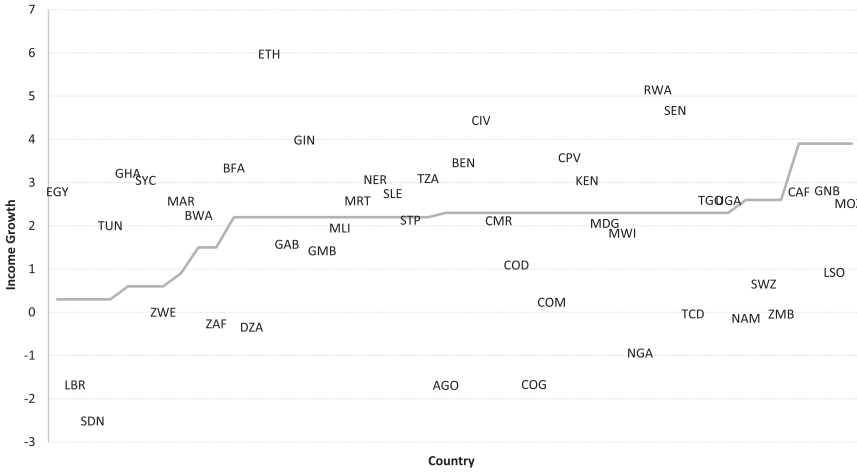

Figure 1. Income Growth Performances in Africa under BAU Scenario. *Source:* Simulation Results and World Development Indicators, (World Bank, 2019). Note: DZA: Algeria; AGO: Angola; BEN: Benin; BWA: Botswana; BFA: Burkina Faso; BDI: Burundi; CPV: Cabo Verde; CMR: Cameroon; CAF: Central African Republic; TCD: Chad; COM: Comoros; COD: Democratic Republic of the Congo; COG: Republic of Congo; CIV: Côte d'Ivoire; DJI: Djibouti; EGY: Egypt; GNQ: Equatorial Guinea; SWZ: Eswatini; ETH: Ethiopia; GAB: Gabon; GMB: The Gambia; GHA: Ghana; GIN: Guinea; GNB: Guinea-Bissau; KEN: Kenya; LSO: Lesotho; LBR: Liberia; LBY: Libya; MDG: Madagascar; MWI: Malawi; MLI: Mali; MRT: Mauritania; MAR: Morocco; MOZ: Mozambique; NAM: Namibia; NER: Niger; NGA: Nigeria; RWA: Rwanda; STP: São Tomé and Príncipe; SEN: Senegal; SYC: Seychelles; SLE: Sierra Leone; ZAF: South Africa; SSD: South Sudan; SDN: Sudan; TZA: Tanzania; TGO: Togo; TUN: Tunisia; UGA: Uganda; ZMB: Zambia; ZWE: Zimbabwe.

6. Conclusion

Consensus has emerged that growth is essential to poverty reduction, but how much growth reduces poverty is dependent on the rate of economic growth itself, the initial inequality and the change in inequality. This paper employed a microsimulation technique to assess the income growth targets required for Sub-Saharan African countries to achievie the SDG on poverty. The results confirm empirical literature findings that suggest that both initial inequality and income levels are strongly related to income growth and poverty reduction. Further, the results show that countries with high income and low inequality levels can achieve the poverty reduction goal through income growth only, i.e., without requiring a significant reduction in income inequality. Countries with lower income and high inequality levels need a combination of income growth and income inequality reduction to meet the poverty reduction target. Specifically, an annual average per capita income growth of around 0.3% is required for countries with low inequality level (below 0.4) and high relative income growth level, i.e., ratio of average income to poverty line (above 3). On the other hand, an annual average per capita income growth of around 3.9% is required for countries with high inequality level (above 0.5) and low income growth level (below 1).

Our results reveal that more than half (55%) of African countries are off track to halving poverty between 2015 and 2030, i.e., to meeting SDG 1. These countries show an average income growth of 2% over the period 2015–2024. This growth performance is not sufficient with regards to the countries' prerequisites, i.e., high-income inequality and low-income level, on the one hand, and the historical trend in income inequality reduction, on the other hand. Thus, it is found that African countries should strive to deliver higher income growth results, i.e., above 2% in annual average GDP per capita, to be on track to halving poverty

between 2015 and 2030. Specific policies to achieve this would be likely country-dependent and such future research is worthwhile.

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Supplementary material

Supplementary material is available at *Journal of African Economies* online.

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