

Can Africa Reduce Poverty by Half by 2015?
The Case for a Pro-Poor Growth Strategy

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Abstract

This study uses simulations to explore the possibility of achieving the target of halving the percentage of people living in extreme poverty in Africa by 2015. A pro-poor growth scenario and a constant inequality scenario are compared. It is shown how initial levels of inequality and mean per capita income determine the cumulative growth and inequality reduction required to achieve the target. The simulations show that small changes in income distribution have a large impact on the possibility of halving poverty. It is shown that the trade-off between growth and inequality varies greatly among countries and that their policy choices thus are quite different. In some cases small changes in income distribution can have a large effect on poverty, while in others a strong focus on growth is the only viable option.

1. Introduction

The international community has formulated a set of goals referred to as the Millennium Development Goals to be reached by 2015. The first of these goals (MDG1) states that the proportion of people with an income of less than \$1 a day shall be halved relative to what it was in 1990. Between 1990 and 2001 the headcount ratio of poverty for all LDCs fell from 27.9% to 21.1%, but the ratio for Africa actually increased from 44.6% to 46.4% (Ravallion, Chen, 2004).¹ Against this background it is not surprising that several recent papers argue that most African countries will not achieve the target of reducing poverty by half by 2015 (e.g. UNDP, 2003, Naschold, 2004).²

The rate of economic growth required to reduce poverty to a certain extent depends on the elasticity of poverty with respect to economic growth. This elasticity depends on the level of the poverty line, the mean income, and income distribution (see e.g. Kakwani, 1991, Datt and Ravallion, 1992, Bourguignon, 2002, 2004). Most studies choose to use a constant value of the elasticity of poverty with respect to growth, for the sake of simplicity, although the elasticity of poverty with respect to economic growth varies with level of economic development and income distribution. This study utilizes new insights gained about the determinants of the elasticity of poverty and some of its key features to assess the challenges of achieving MDG1 in Africa.

Until recently the conventional wisdom has been that the elasticity of poverty with respect to growth would be high for low-income countries because a large number of people are clustered around the poverty line. We find, however, that African countries with low initial levels of per capita income and high income inequality need very high growth rates and/or reduction in income inequality to achieve the MDGs.

The relative contributions of economic growth and income distribution to the poverty reduction depend mainly on the relationship between growth and income inequality as shown by the slope of the *iso-poverty curves*. A high elasticity of the trade-off means that a small reduction in inequality can lead to substantial decline in poverty, or conversely, maintaining this level of inequality require higher rate of growth to achieve a small decline in poverty. A low elasticity implies that what matters for poverty reduction is mainly accelerated economic growth. The attainment of MDG1 is thus very much dependent on the specific circumstances prevailing in each country. In this paper we show how the elasticity of poverty with respect to growth and income distribution varies with the level of development and degree of income inequality. Estimates of poverty trends should be corrected or control for the impact that economic progress and reduction of income inequality have on the magnitude of the poverty elasticity as we look forward to year 2015.

Focusing on economic growth alone may not be the right policy response to the challenges of achieving such targets as halving poverty by 2015. In some cases a slight decline in income inequality can lead to a substantial decline in the incidence of

¹ These estimates are based on nationally representative household surveys in 97 countries.

² The estimates are largely based on linear extrapolations of data on poverty changes over short periods. Most use estimates of elasticity of poverty with respect to growth as a basis for the extrapolations.

income poverty for a given rate of economic growth. Thus, it is necessary to study and understand the growth-inequality-poverty nexus.

The rest of this paper is organized as follows. Section 2 of the paper briefly discusses the conceptual framework, section 3 discusses the results, and section 4 outlines some of the caveats underlying the methods of assessment of MDG1 and discusses policy implications, and areas for future work. Section 5 concludes the paper.

2. Conceptual and Methodological Issues

Ever since the launching of the International Development Goals by the OECD in the mid-1990s, several studies have used the concept of the elasticity of poverty with respect to growth to evaluate the magnitude of economic growth required to achieve the goal of halving poverty by 2015 (e.g. Demery and Watson, 1998; ECA, 1999; Hanmer and Naschold, 1999, 2000). Such estimates have given what may be considered a first order approximation to the link between poverty and economic growth. The notion of a pro-poor growth strategy is an extension of the discussion on the efficiency of growth to reduce poverty. Recent works have suggested a number of methods of measuring the pro-poorness of economic growth (e.g. Kakwani and Pernia, 2000, White and Anderson, 2000, Ravallion and Chen, 2003, and Son, 2004).

There are at least three approaches available to estimate the elasticity of poverty with respect to growth. One method is to use information on poverty, inequality and per capita income and run the regressions on the log variables to extract the desired elasticities. The coefficients of the regression provide the required elasticities. This method is frequently used in cross-country studies (e.g. Ali and Thorbecke, 2000, Fosu, 2002), where data on poverty and inequality are not available for more than one period in a given country. The second approach is to use the ratios of changes in poverty to changes in growth over a given period as a measure of the elasticity of poverty with respect to growth when such data is available (Ravallion, 2000). The third approach is based on decomposition of a poverty measure into growth and inequality components (see e.g. Kakwani, 1990, Datt and Ravallion, 1992, Bourguignon, 2002, and Kraay, 2004). This approach basically decomposes the change in the measure of poverty into the components of economic growth and change in income inequality. The data requirement for this approach is minimal (one period information on distribution of income is sufficient). The discussions about the possibility of achieving the MDG1 in Africa is based mainly on the last method since the data available on poverty and inequality for most African countries is limited to one period. But some results based on the other two methods are also reported to gain further insight on the behaviour of the elasticity of poverty with respect to overall growth as well as for purposes of checking the robustness of the reported values.

The method of decomposing changes in poverty into the components of growth and income distribution change provides a measure of point elasticity, while the other methods provide an arch measure of elasticity or an average measure of elasticity. Which type of elasticity is better for such kind of analysis depends on a number of factors, including the type of poverty being measured.

In what follows, we sketch the decomposition method used to evaluate the relevant elasticities. At the analytical level any poverty measure can be defined over per

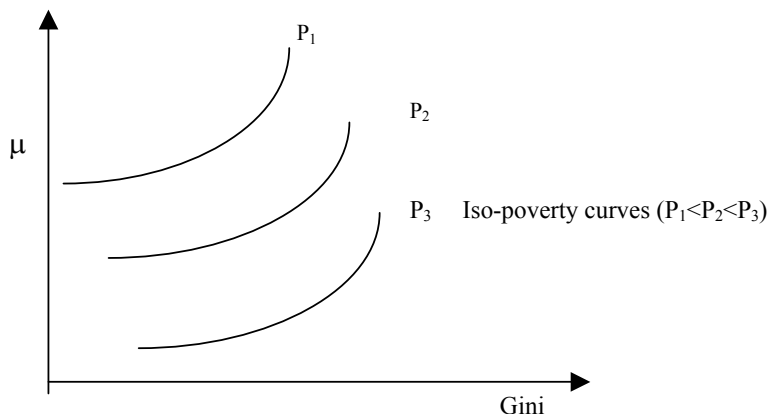
capita income and a measure of income inequality (Kakwani, 1991, Ravallion, 1992). By using this feature we can get some idea of the order of magnitude involved in redistribution efforts for poverty reduction.

If we know the level of the poverty line, z , mean per capita income, μ , and the distribution underlying that per capita income, G , we can obtain a measure of poverty (Eq. 1) that is consistent with standard axioms.³

$$P = P(z, \mu, G) \quad (1)$$

Poverty increases with the poverty line and the Gini coefficient, and declines with per capita income. It is homogenous of degree zero with respect to z and μ . Using these properties of the poverty index, we can generate a set of per capita incomes and Gini coefficients that give rise to a certain level of poverty, that is iso-poverty curves as depicted in Figure 1. This relationship has been utilized in Bourguignon (2002), Ashan and Oberi (2002), Bigsten and Shimeles (2003), Kakwani and Pernia (2003), and ECLAC (2003) to establish the link between economic growth and poverty reduction. If the poverty line remains constant over time, we can link per capita income and the Gini coefficient to generate a locus of points for a given level of poverty as shown in Figure 1.

Figure 1: Per capita income -Inequality Trade-off



The slope of the iso-poverty curve is the issue of concern here. Figure 1 assumes convex iso-poverty curves, which depend on the second derivatives of the poverty function with respect to μ and G , and the interactions between μ and G . If we follow Kakwani et al (2003), we get this convex shape for the iso-poverty curves.⁴

³ These axioms are mainly the axioms of focus, monotonicity, transfer, sub-group consistency, decomposability (see Hagenaars, 1987 for an in depth discussion of the properties of poverty indices).

Bourguignon (2002, figure 3) uses G on the vertical axis and $\frac{z}{\mu}$ on the horizontal axis to depict an iso-

poverty curve, which is downward sloping for a given poverty line. His main concern is to address the cross-country variations often reported in the elasticity of poverty with respect to economic growth.

⁴ If we follow the common practice in the empirical literature (e.g. Besely and Burgess, 2002, Fosu, 2002, Ali, 1996), where the log of poverty is regressed on the log of income inequality and per capita income, to get elasticity values, we can assume a Cobb-Douglas specification for the poverty function and determine its curvatures on the basis of the elasticity values.

Bourguignon (2002) used the decomposition that follows from the definition of poverty (a la Kakwani, 1991, and Datt and Ravallion, 1992) to estimate the elasticity of poverty with respect to economic growth, taking the impact of distributional changes into account. This leads to a specification of an econometric model that can be used to estimate the connection between growth, poverty and income inequality.

From equation (1) we can totally differentiate the poverty rate with respect to inequality and growth to get the following:

$$\frac{dP}{P} = \frac{\partial P}{\partial \mu} \frac{\mu}{P} \frac{d\mu}{\mu} + \frac{\delta P}{\delta G} \frac{G}{P} \frac{dG}{G} \quad (2)$$

where the first term of the right hand side of equation (2) captures the percentage change in the measure of poverty as a result of a marginal change in per capita income, and the second term captures the effect of the marginal change in the Gini coefficient. In a discrete case, equation (2) will have a “residual” term arising out of the effect that changes in the underlying parameters of the Lorenz curve have on per capita income and the Gini coefficient (see e.g. Datt and Ravallion, 1992). Or in other words, most poverty measures are jointly determined by mean per capita income and the distribution of that income. Equation (1) is therefore not additively separable between μ and G , which means that the marginal effect of say per capita income on poverty will depend on the precise level of the Gini coefficient in question and vice versa.⁵ Since our decomposition is applied to continuous cases, we do not need to worry about the residual term. Even in a discrete case, the residual term is considered to be quite small in affecting changes in the poverty measures (e.g. Kraay, 2004).

Now, setting:

$$\begin{aligned} \frac{\partial P}{\partial \mu} \frac{\mu}{P} &= \varepsilon, \\ \frac{\delta P}{\delta G} \frac{G}{P} &= \theta, \\ \frac{d\mu}{\mu} &= \beta, \\ -\frac{dG}{G} &= \alpha, \end{aligned}$$

we can rewrite the target of halving poverty by 2015 as functions of α , and β , which can be regarded as the rate of reduction in income inequality and economic growth needed to achieve the target given ε and θ , which respectively are the elasticities of poverty (headcount ratio) with respect to economic growth and income inequality. Thus, we have:

⁵ The above decomposition of a change in poverty into components of growth and income distribution refers to a small change around the poverty line in the case of the headcount ratio. As a result, the elasticities tend to be larger in countries where significant percentage of people is clustered around that line.

$$\alpha = \frac{1}{2\theta} + \frac{\varepsilon}{\theta} \beta \quad (3)$$

Equation (3) offers an approximation to what we can call an iso-poverty function at the MDG target. Given estimates of ε and θ , it is possible to obtain the amount of inequality reduction (α) and economic growth (β) required to achieve the target of halving poverty. In other words, the values of α and β provide a simulation of a pro-poor growth strategy. The intercepts of equation (3) are of particular interest in our case. They provide the cumulative rate of economic growth that is required to achieve the MDG target in the absence of any reduction in income inequality, and vice versa. In addition, we can also use equation (3) to simulate the required reduction in income inequality if the historical rate of per capita growth is assumed to prevail up to 2015. These simulations provide insight into the relative roles of changes in income distribution and rate of growth on the prospect of achieving the MDG target.

The second valuable information we can extract from an iso-poverty function is the degree of trade-off that exists between income inequality and growth for a given level of poverty. We can derive the magnitudes involved by totally differentiating (1) and setting changes in poverty equal to zero.

Thus

$$\frac{d\mu}{dG} \frac{G}{\mu} = - \frac{\frac{\partial P}{\partial G} \frac{G}{P}}{\frac{\partial P}{\partial \mu} \frac{\mu}{P}} \quad (5)$$

We can rewrite equation (5) as

$$v = - \frac{\theta}{\varepsilon} \quad (6)$$

where v is elasticity of per capita income with respect to the Gini, θ is elasticity of poverty with respect to Gini and ε is elasticity of poverty with respect to mean per capita income. If v is small, say <1 , the effectiveness of redistribution as a tool for a poverty reduction tends to be small. Or in other words, the amount of economic growth needed to keep the level of poverty unchanged is small. When the elasticity is high, on the other hand, the payoff for a strategy of redistribution would be substantial. We report in section (3) the results for selected African countries of both simulations.

3. Discussion of Results

This section reports the results of macro-simulations (prospects for pro-poor growth to achieve the MDGs) and the ‘trade-off’ between income inequality and economic growth that keeps the level of poverty unchanged. The data come from three sources. Data on quintile distribution of income and the Gini coefficient are obtained from WIDER income distribution data sets, per capita income are obtained from Penn World Tables, while real per capita growth estimates are from World Development Indicators 2003. Based on these data sets, we have computed the headcount ratio using three alternative poverty lines: two fixed poverty lines for purposes of international comparison (1\$ a day per person and 2\$ a day per person) and national

poverty lines based on an estimating equation⁶ following Thorbecke (2003), Ali and Thorbecke (2000) and Ravallion, Datt, and van de Walle (1991). In addition, the relevant elasticities (ϵ , θ , and ν) were estimated by fitting two types of Lorenz functions: the quadratic and beta Lorenz functions (see Datt and Ravallion, 1992 for details). The computer program POVCAL was used to obtain the results.

The first simulation is to see the implication for a pro-poor growth strategy of the values of the poverty elasticities with respect to growth and income inequality (see Table 1) to MDG1. The results refer to 26 countries that were selected on the basis of the availability of the relevant information for the period around 1990, which is the base year for the MDGs.

<Table 1 around here>

The first point is that the median cumulative reduction in income inequality required to achieve the target of reducing extreme poverty by half by 2015 without growth in per capita income is 10.4%. If the span of the target period is 10 years (say between 2005-2015), then, the annual reduction in income inequality needed to halve poverty by 2015 is about 1.4% on the assumption that per capita income growth is zero throughout this period. On the other hand, in a situation where income inequality is held constant at the current level, the cumulative growth in per capita income needed to achieve goal 1 is 22.8% or an annual rate of per capita income growth of about 2.3%. In other words, following a pattern of growth that either reduces income inequality, or manages to contain it at its existing level has enormous implication on the rate of economic growth that is required to halve poverty in Africa. Therefore a pro-poor growth strategy has a potential to deal with the challenge of achieving goal 1 of the MDGs.

The other point of interest is the diversity among African countries in the results of our simulations. The cumulative reduction in income inequality required to halve poverty without growth varies from a low of 1.89% for Namibia (a very unequal society with a Gini coefficient of 74.3%) to a high of 65.79% for Tanzania, a country with a relatively low level of inequality. Very unequal countries benefit substantially from marginal reductions in income inequality, and also suffer hugely from a slight rise in income inequality. With respect to the overall growth in per capita income required to reduce poverty by half, the value varies from a low of 6.99% for Morocco (a relatively rich economy) to a high of 58.82 for CAR (a middle income economy with very high level of inequality).

We compared the actual rate of per capita income growth recorded between 1990 and 2001 with the cumulative growth required to achieve goal 1 with neutral pattern of

⁶ The estimating equation linking poverty line with per capita income used is

$$\ln z = 1.3719 + 0.00303u - 0.00000186u^2 \quad R^2 = 0.96$$

(57) (10.96) (-5.25)

where u is mean per capita income in 1985 PPP dollars and z is national poverty lines assembled from household surveys.

growth (no change in income inequality). The result as shown in Figure 2 is quite interesting.

<Figure 2 here>

For the sample of countries considered in the simulations, the median rate of actual growth in per capita income in the period 1990-2001 was around 0.46%. This is an indicative of the overall stagnation that characterised African economies in the 1990s. However, for some countries, such as Uganda, Namibia, Botswana, Mozambique, and Ghana, the actual growth in per capita GDP exceeded that of the rate of growth required to halve poverty by 2015, suggesting that these countries even can afford some increase in income inequality if they can sustain the historical growth rate up to 2015. For most others, long-term growth was either negative or so small that to attain goal 1 of the MDGs they may need both accelerated growth and reduction in income inequality. Figure 3 reports the order of magnitude involved in the reduction of inequality required to achieve goal 1 if current trends in per capita GDP growth prevail. Such countries as Botswana, Uganda, Mozambique, and Ghana can afford a moderate increase in the measure of income inequality in the coming years, while achieving goal 1 in record time. So, unless the income distribution changes significantly for the worse in these countries, current growth rates can enable them achieve goal 1. In addition, such countries as Ethiopia, Mauritania, the Gambia, Lesotho, and Tanzania need a very low reduction in inequality to achieve goal 1. Significant reduction in income inequality is needed mainly for those countries whose decadal growth rate has been either close to zero or negative.

<Figure 3 here>

Now, the most important issue in this discussion is what actually determines the elasticity values on which our simulations depended. The cross-country correlations between the values of these elasticities and levels of the basic arguments provide a glimpse of the long term relationships, or the role of initial conditions. Figures 1-12 in the Appendix show scatter diagrams of correlations between the cumulative per capita income growth and inequality reduction, and levels of per capita income, Gini coefficient, and poverty for a set of African countries for which the relevant data are available. The results show that there is a significant correlation between the elasticities of poverty with respect to growth and distribution with the levels of per capita GDP (level of development) and income inequality (degree of equitable distribution). The absolute values of both elasticities increase with development and equitable distribution of income. As countries grow, and also manage to reduce poverty, the efficiency of economic growth in reducing poverty increases. Also, countries with low level of economic development and high initial level of income inequality will find growth to be less efficient in reducing poverty.

The strength of the relationship between elasticities and levels of per capita income and inequality also varies with the manner in which the poverty line is set. With fixed poverty lines, there are a number of non-linearities reflected in the relationship. Once we correct for the effect of the poverty lines by using national poverty lines⁷, we find

⁷ There is a debate in the literature whether or not to hold poverty lines constant in cross-country comparisons. One view is that poverty lines reflect level of development, and should be adjusted for differences in standard of living (e.g. Foster, 1998, Ali and Thorbecke, 2000). The other view is that it

a robust and significant linear relationships between the elasticities and the levels of the arguments (see Appendix figures 1-12 for details of these relationships). This result is consistent with the recent findings reported in Bourguignon (2002, 2004) where the identity in the poverty decomposition into growth and distribution components is found to be varying with the level of development and income inequality under the assumption that income distribution is lognormal. It follows that in country-level simulations, one should adjust the elasticity of poverty with respect to growth and distribution for changes in levels of development and income distribution.

The other simulation we do investigates the trade-off between income inequality and economic growth. That is, the elasticity of trade-off between economic growth and income inequality is estimated to compute how much extra growth is required in an economy to compensate for a rise in income inequality while keeping the level of poverty unchanged (equation 5 above). We have computed this elasticity for 27 countries in Africa as reported in Table (2) using the headcount ratio as our measure of poverty.

<Table 3 here>

To retain the same level of poverty, the extent of trade-off between growth and income distribution depends on the slope of the iso-poverty curve. Suppose a country wishes to remain on one iso-poverty curve (see for example Ali and Elbadawi, 1999), then it may have a choice between a policy that increases mean incomes and increases inequality and another one that lowers per capita incomes but reduces inequality. The extent of the trade-off depends on the ratio of the elasticity of poverty with respect to income distribution and per capita income as shown in Table (2).

For most African countries, this ratio is quite small, suggesting that there is little to gain in terms of poverty reduction from redistribution policy. For countries with high initial inequality, such as Gabon, South Africa, and Zimbabwe the inequality-growth trade-off is high. In those cases there will be a significant poverty reduction impact also from small reductions in inequality. It is important to notice that the elasticity varies considerably by the point where the poverty line is located and the slope of the Lorenz curve at that point. Nevertheless, Table 2 gives an illustration of the trade-off between growth and redistribution in Africa. One has to be cautious in interpreting these elasticities, since they are essentially mechanical, non-behavioural relations.

is difficult to make comparisons of poverty across countries without fixing the welfare indicator (e.g. Ravallion, 1998). As far as MDGs are concerned, it is much more realistic to think of a poverty line that reflects local living conditions. In this study, we have used fixed and national poverty lines for illustrative purposes.

In Table 3 we apply two different poverty lines to compute the slope of the iso-poverty curve. These are the 1\$ and 2\$ a day per person that are often used in cross-country poverty comparisons. If data had been available it would have been more sensible to use national poverty lines to evaluate the elasticity ratios to get an idea of how a movement along an iso-poverty curve behaves with changes in either income inequality or per capita income. For some countries, we could not compute the relevant elasticities, particularly, for relatively high-income countries when the poverty line was set at 1\$ a day per person. Nevertheless, we can observe at least three things from Table 3.

One is that high-inequality and relatively high-income countries (e.g. Namibia, South-Africa, Senegal, Gabon, Zimbabwe) had higher elasticity of the iso-poverty curve, indicating that redistribution policies may be effective tools in dealing with poverty in those countries. For instance, if we take South-Africa, at the poverty line close to 750\$ per person a year, a one percent decline in the measure of income inequality needs about 9% decline in per capita income to remain on the same poverty level. That means that the joint effect of a reduction in per capita income lower than 9% and a one percent decline in the Gini would be a reduction in poverty. This means that it takes a large reduction in per capita income following a one percent reduction in the Gini for poverty not to decline, and any increase in income inequality must be compensated by a large per capita income increase if the existing level of poverty is to be maintained.

The second point to note is that, for low-income countries, such as Burundi, Burkina Faso, Niger, Ethiopia, Tanzania and Zambia, the room for poverty reduction via redistribution is very limited. A one percent reduction in income inequality would only need a small change in per capita income to stay on the same level of poverty. The iso-poverty curves for these countries are flatter. Likewise, the effect of rising income inequality on poverty would be offset by a low rate of growth in per capita income. An increase in inequality may not be a significant poverty threat if there is a high rate of growth in these countries.

Finally, we note that the elasticity is considerably higher at the lower poverty line. This suggests that redistribution policies are relatively more beneficial for the very poor. What it shows is that there are more people just below the poverty line of one dollar than immediately below the poverty line of two dollars.

The main message of this simple exercise is that the trade-off between redistribution and growth varies quite a lot by country. Depending on the order of magnitude involved in the trade-off, the best choice of a pro-poor growth path varies. We should add, however, that our estimates are entirely based on the definition of poverty, with no inherent functional relationship between growth and income inequality. Since there is a structural relationship between the two, the choices that a country has may be restricted. The much harder question to analyse is how different pro-poor policies affect the growth rate of the economy. This requires tools of analysis, such as economy-wide equilibrium-models, which takes us beyond the simple analysis of this paper.

4. Growth, Poverty and Inequality: *Some notes on the nexus*

It is important to note that the results reported in section (3) on the relationships established between growth, poverty and income inequality are based on an identity. There is no causal relationship between income inequality and per capita income in determining poverty outcomes that can be exploited for policy purposes. This is a major drawback of the simulations. But our results tend to be robust when checked against a case where one adopts a specific functional form of the relationship between poverty, per capita income and a measure of inequality to capture the nexus in the sense of a typical ‘poverty-production function’ (e.g. Fosu, 2000), where it is possible to write:

$$P = P(\mu, G(\mu)) \quad (7)$$

The key assumption of equation (7) is that poverty reduction is primarily a function of economic growth ($\Delta\mu$), but its effect can be slowed down by the change in income distribution (ΔG) through interaction with μ . Equation (7) does not depend on the identity between poverty, per capita income and income inequality. A double-log estimating equation specified for equation (7) gave the following result:

$$\text{Ln } P_i = 50.14 - 8.16471 \ln \mu_i - 9.40811 \ln G_i + 1.708811 (\ln \mu_i \ln G_i) \quad (8)$$

(3.7) (-4.3) (-2.8) (3.6) Adj R²=76 N=48

where terms in brackets are t-ratios. Using equation (8) the partial elasticities with respect to growth (ε) and the Gini coefficient (θ) can be obtained for each country in the sample by noting the fact that:

$$\begin{aligned} \varepsilon_i &= -8.16 + 1.7 \ln G_i \\ \theta_i &= -9.41 + 1.7 \ln \mu_i \end{aligned} \quad (9)$$

An interesting parallel can also be observed between equation (9) and the decomposition of poverty changes when the poverty measure is not additively separable between growth and income inequality. Equation (8) is a Cobb-Douglas type of poverty function with an interaction term added to control for the joint effect of per capita income and inequality on poverty. The interaction term can be regarded as a residual of the decomposition between growth and inequality that systematically varies with the precise level of the Gini coefficient and per capita income as indicated in Datt and Ravallion (1992).

These elasticities are compared with those obtained directly from the Lorenz functions. The correlation is 60% for the elasticity of poverty with respect to growth and 76% for elasticity of poverty with respect to inequality. This indicates that there is significant correlation between the model-based poverty elasticities and those derived from the poverty identity. In some respect therefore, the discussion in the preceding section is quite robust to different formulations of the poverty-inequality and growth nexus.

On the other hand, it is very important that simulations in subsequent work include changes in the structure of the economy, and composition of household income to

determine the sources of growth and income distribution. Micro simulations can be used to analyse how, for example, investments in physical and human capital contribute to economic growth and income inequality, and thus poverty. In Africa, such analyses have so far been constrained by lack of household or individual data on household living standards to researchers for a large number of countries. The recent household budget surveys, for example the Living Standard Measurement Surveys of the World Bank, provides a basis for a deeper analysis of the challenges of achieving MDGs in Africa.

5. Conclusions

Several recent studies (e.g. Dollar and Kraay, 2002, Kraay, 2004) have concluded that income distribution has played a limited role in the process of reducing poverty in recent decades. Kraay reports that an overwhelming share of the change in poverty over time in his data set is explained by the growth component as opposed to the distribution component. Our results do not invalidate these results, but they show (like those of Besely and Burgess, 2000, and White and Anderson, 2000) that even modest reductions in inequality can have a large poverty reducing impact. If a pro-poor growth pattern can be achieved, poverty reduction in Africa can be quite rapid.

Africa suffers from deep-seated, structural problems that propagate poverty. There is an abundance of empirical research trying to explain Africa's poor economic performance, mainly based on information on macroeconomic aggregates.⁸ A wide range of factors have been identified ranging from macroeconomic instability (caused by several external and domestic shocks) to a set of initial conditions, such as geography (Sachs and Warner, 1997), ethnic fractionalisation and conflict (Collier and Hoeffler, 1998), 'bad' policies (Sachs and Warner, 1997; Collier and Dollar, 1999; Easterly, 2000), poor governance (Barro, 1997), weak institutions (Acemalogu, Johnson, and Robinson, 2002; Rodrik et al, 2002), and low level of human capital. Recently, Sachs et al (2004) have argued that there are three forms of poverty traps in Africa: the saving trap, the demographic trap, and the low capital-threshold.

Given these features, the potential for income distribution to contribute significantly to achieving the MDGs is substantial. As we have noted there is extensive evidence on the sources and determinants of economic growth, but there is as yet very little empirical research available on the determinants of inequality in Africa, and its interaction with economic growth. This is an area where much work remains to be done.

⁸ One of the important contributions in this area comes from case studies conducted by the African Economic Research Consortium.

Table 1: Growth-Inequality Trade off for Selected African Countries to Achieve Goal1

Country	Year (latest)	Mean per income (1985PPP)	Gini (%)	Headcount (%) (latest)	Reduction in Gini required to reduce poverty by half without growth (%)	Growth rate in per capita GDP required to reduce poverty by half without change in inequality (%)
Burundi	1992	926.00	33.33	8.66	8.31	15.63
Botswana	1986	4023.00	54.21	10.37	4.60	20.75
Burkina Faso	1994	971	48.85	23.55	13.97	23.26
Cote d'Ivoire	1993	10970	37.11	10.86	8.91	14.84
CAR	1993	1306	61.33	33.92	22.73	58.82
Ethiopia	1995	583	40.01	39.73	46.30	27.62
Ghana	1989	1303	36.74	4.18	3.70	9.51
Guinea	1991	2657	46.87	9.03	6.69	42.02
Gambia	1992	1312	47.69	13.57	10.37	26.88
Kenya	1994	1215	44.68	12.64	10.50	24.39
Lesotho	1993	2215	57.94	15.84	6.18	31.25
Madagascar	1993	888	43.46	22	18.12	25.91
Mali	1994	854	50.69	34.07	27.93	37.59
Mozambique	1996	1003	39.61	12.02	10.42	18.18
Mauritania	1995	1399	39.14	5.37	5.77	16.34
Morocco	1984	3242	39.18	2.1	2.03	6.99
Namibia	1993	4541	74.3	12.91	1.89	21.65
Niger	1995	880	36.2	11.65	11.01	15.53
Nigeria	1997	1072	50.56	22.77	15.38	29.76
Rwanda	1984	1108	29.12	30.35	35.21	18.25
Senegal	1994	1498	41.28	3.06	3.83	11.90
South-Africa	1993	7233	61.06	10.31	3.28	29.24
Tanzania	1993	553	38.4	41.3	65.79	33.78
Uganda	1993	788	39.02	21.53	20.00	22.42
Zambia	1996	836	49.86	30.95	27.03	37.88
Zimbabwe	1990	2948	56.83	19.75	7.40	22.42

Source:

Table 2: Poverty Elasticities Based on Poverty and Growth Spells for Selected African Countries

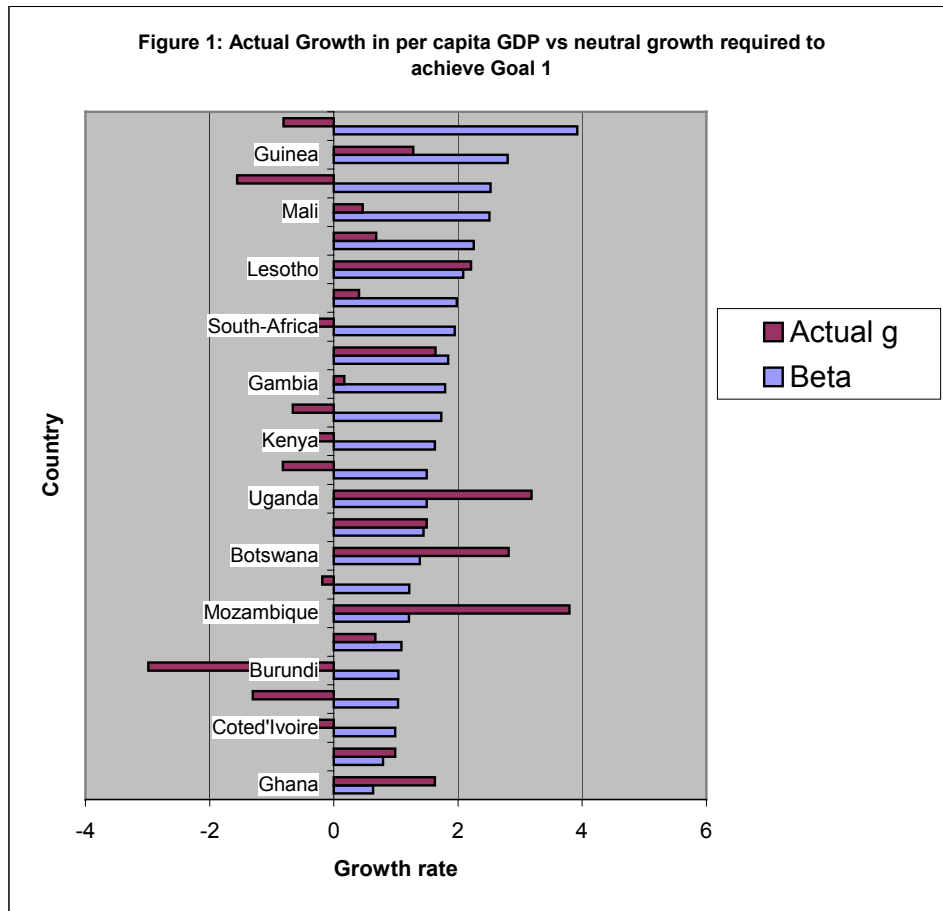
Country	Years	ΔH	$\Delta \mu$	ΔG	$\Delta H/\Delta \mu$
Gambia	1991 V 1992	-12.69	-3.53	-15.10	3.60
Ghana	1992 v 1997	-0.58	0.93	-0.56	-0.62
Ghana	1993 v 1997	-0.74	0.72	-0.49	-1.03
Guinea	1991 V 1994	-21.47	0.93	-4.82	-23.03
Kenya	1992 v 1994	-14.17	-0.25	-11.82	57.58
Mauritania	1993 v 1995	-15.06	-1.12	-11.57	13.39
Niger	1992 v 1995	0.16	-0.86	0.00	-0.19
Nigeria	1991 V 1997	2.35	-0.38	2.01	-6.13
Nigeria	1992 V 1997	4.09	0.88	4.21	4.64
Nigeria	1993 V 1997	3.10	3.37	3.02	0.92
Senegal	1991 v 1994	-9.60	-2.11	-8.63	4.55
Tanzania	1991 v 1993	-14.35	-1.76	-19.38	8.15
Uganda	1992 v 1993	-9.21	3.96	-4.32	-2.33
Zambia	1991 V 1997	3.12	-4.62	2.67	-0.67
Zambia	1993 V 1997	2.03	-2.84	2.54	-0.72

Source: Authors' computation

Table 3 Equity-Growth 'Trade-off' for Selected African Countries

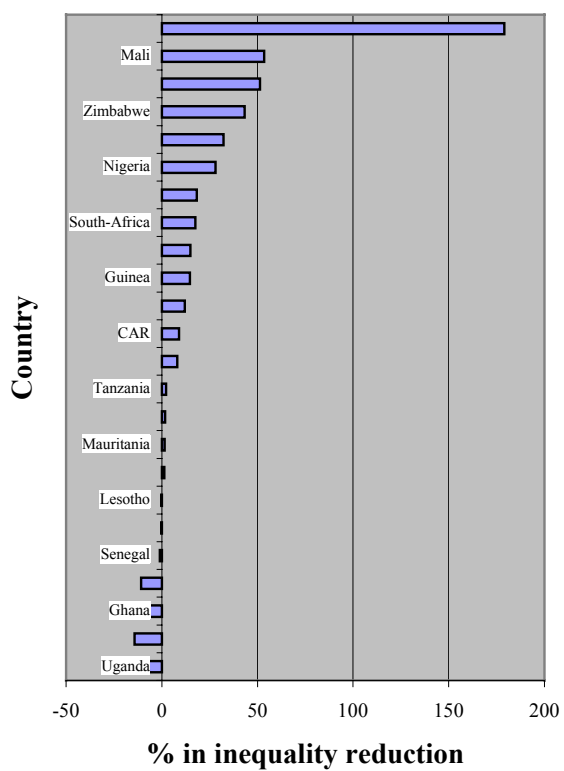
Country	Year	V_1	V_2	Gini coefficient	Per capita income (in 1996 PPP)
Burundi	1992	1,54	0,268	33,33	926
Burkina Faso	1994	1,67	0,325	48,20	971
Botswana	1986	---	0,510	54,21	3895
CAR	1993	---	0,789	61,33	1306
Cote d'Ivoire	1993	---	1,700	36,91	1970
Ethiopia	1995	0,60	-0,213	40,00	583
Gabon	1960	7,14	3,056	64,00	2966
Ghana	1997	2,54	0,940	32,70	1416
Guinea	1994	6,28	2,742	46,80	2732
Gambia	1992	2,71	0,797	47,80	1312
Kenya	1994	2,34	0,669	57,50	1215
Lesotho	1993	5,06	2,022	57,94	2215
Morocco	1984	---	3,439	39,19	3242
Madagascar	1993	1,43	0,216	43,44	888
Mali	1994	1,35	0,172	50,50	854
Mozambique	1996	1,75	0,371	39,61	1003
Mauritania	1995	2,83	0,914	38,90	1399
Namibia	1993	11,46	---	74,3	4541
Niger	1995	0,61	0,205	50,50	880
Nigeria	1997	1,93	0,467	50,56	1072
Rwanda	1984	---	0,518	28,90	1108
Senegal	1994	3,10	1,050	41,28	1498
Tunisia	1971	---	2,949	53,00	2882
Tanzania	1993	0,51	-0,240	38,20	553
Uganda	1993	1,16	0,083	39,20	788
South Africa	1993	---	8,924	62,30	7289
Zambia	1996	1,40	0,205	49,80	876
Zimbabwe	1990	---	3,031	56,83	2948

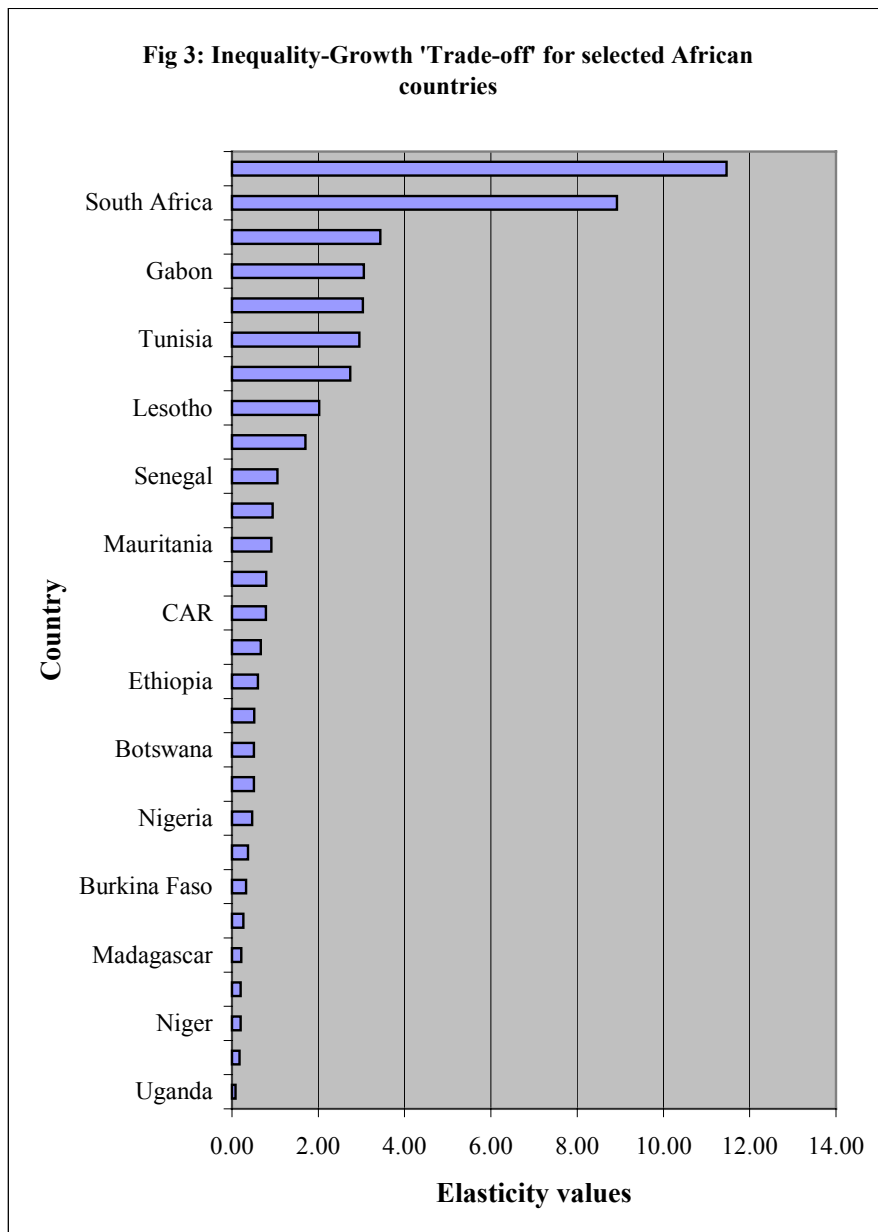
Source: Authors' computations



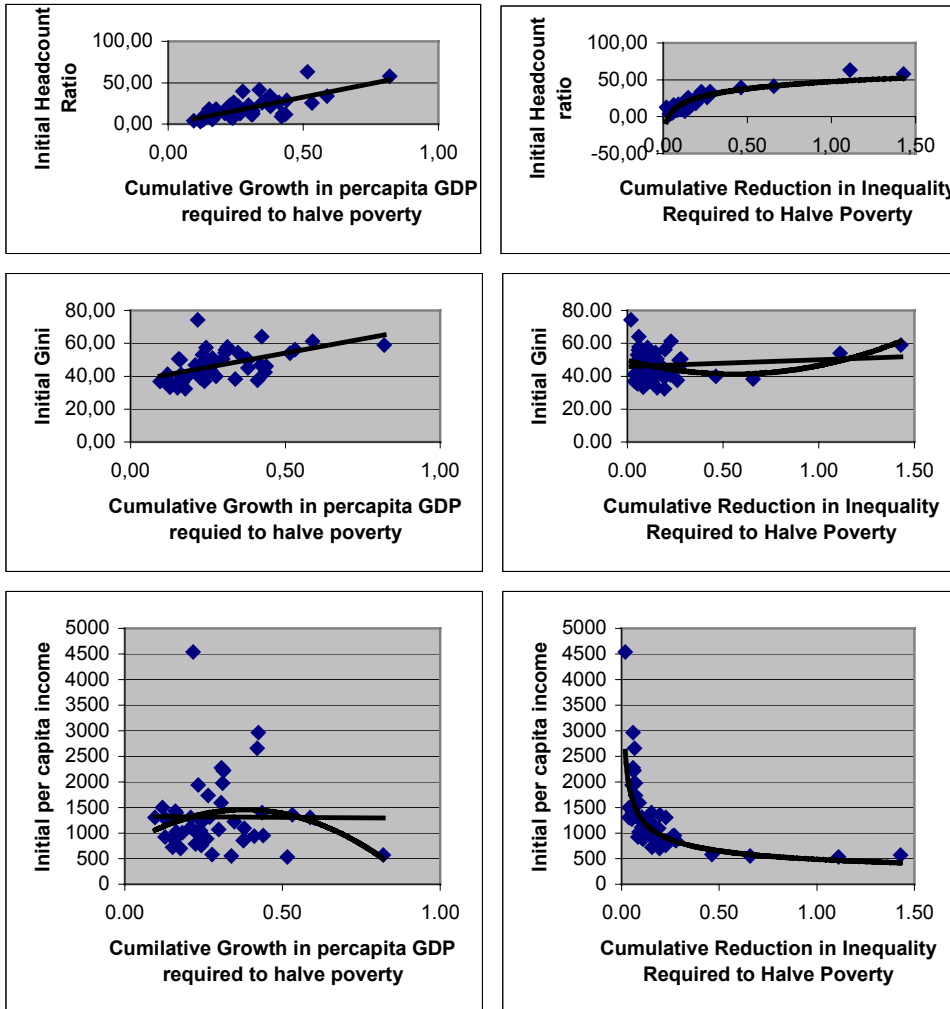
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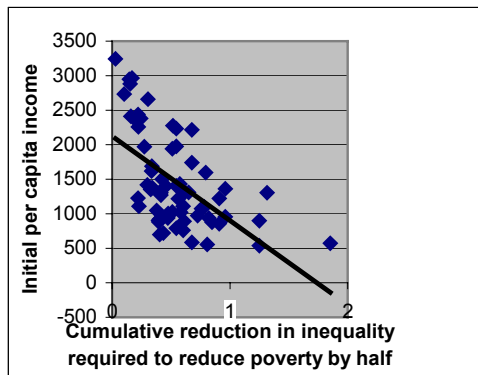
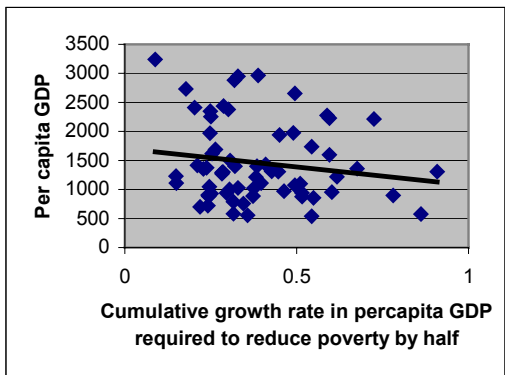
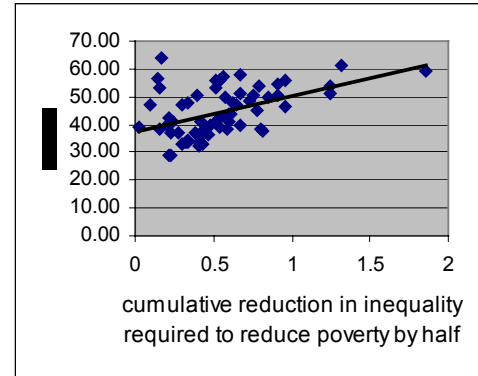
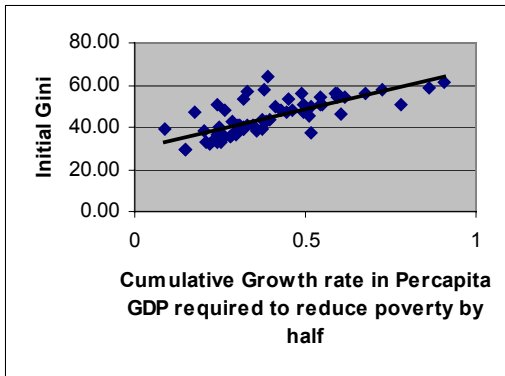
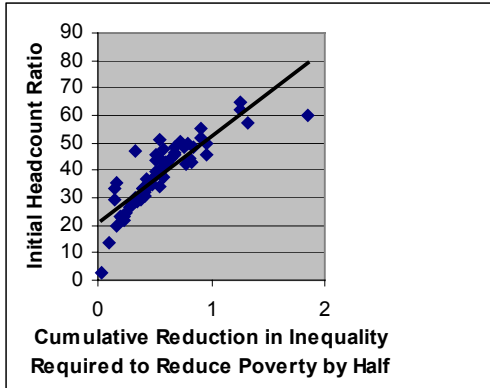
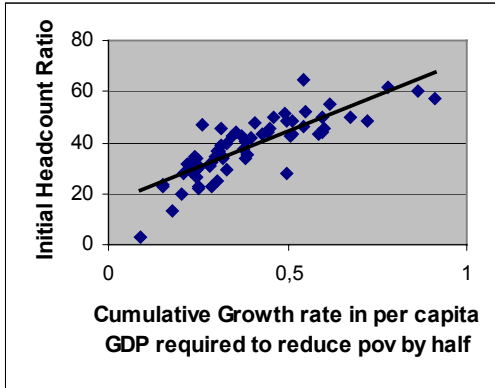
Figure 2: The Reduction in inequality required to achieve Goal 1 if the current trend in growth rates prevails





Appendix Figures 1-12: Initial per capita GDP, income inequality, poverty and the cumulative rate of growth and reduction in income inequality required to achieve goal 1 (1\$ a day and National poverty lines)





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