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Has Economic Growth in Mozambique Been Pro-Poor?

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Abstract

Using 1996–97 and 2002–03 nationally representative household surveys, we examine the extent to which growth in Mozambique has been pro-poor. While all sections of society enjoyed a rapid annual increase in consumption between the sample periods, the rate of growth in consumption was slightly higher for richer households. This has led to a moderate increase in inequality at the national level, as demonstrated by the rise in the Gini coefficient from 0.40 to 0.42. However, this slight increase in inequality is not statistically significant, and its impact on poverty reduction efforts is small: the poverty headcount would have been 53.0 percent in 2002–03 if all sections of society had enjoyed the mean growth rate in consumption, compared with the 54.1 percent at which it actually stood. Interestingly, the use of the entropy class of inequality measures indicates that inequality in real consumption between provinces and regions has diminished over time, in contrast to popular claims. Maputo City continues to have the highest rates of inequality in the country; it witnessed a significant increase in inequality between 1996–97 and 2002–03 (the Gini coefficient rose from 0.44 to 0.52).

Key words: inequality, poverty, growth, Mozambique

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1. Introduction

Within the discourse on "pro-poor growth," the long-standing debate about the extent to which the poor benefit from economic growth has reemerged as a topical and controversial issue. Opponents of the current patterns of economic growth insist that global market forces are leading to ever widening inequalities at national levels. These critics argue that although economic growth may be occurring at an aggregate level, its distribution across income groups is such that the poor see little, if any, benefits (Oxfam 2000). Others disagree. Dollar and Kraay (2002), for example, in a cross-country analysis, conclude that log mean income of the poorest quintile (inferred from distributional shares and GDP per capita) changes one-to-one with the overall log GDP per capita. Empirical evidence is cited to support both views. However, there is considerable controversy over definitions, measurement techniques, and analytical approaches, particularly in the analysis of cross-country data sets (see Ravallion 2001).

At the time of the first national household survey in 1996–97, Mozambique was recognized as one of the world's poorest countries (UNDP 1997). In fact, in the 1996–97 national survey of household consumption (known as the IAF96[1]), mean consumption per capita in Mozambique was actually below the absolute poverty line (MPF/UEM/IFPRI 1998). In other words, if the same level of total consumption had been distributed perfectly equally among Mozambicans in 1996, every man, woman, and child would have lived in absolute poverty.[2] Therefore, in the Mozambican context, the need for pro-poor growth is self-evident: redistribution efforts alone have extremely little scope to reduce levels of poverty. Poverty reduction in Mozambique requires growth, as it does in many low-income countries.

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[1] The abbreviation IAF is from the Portuguese name for the survey, *Inquérito aos Agregados Familiares*, or "Household Survey."

[2] As the mean consumption was 97 percent of the poverty line, if there had been no inequality in the 1996–97 survey, there would have been a minuscule poverty gap (0.027) and a negligible squared poverty gap (0.001)

In the period 1996 to 2002, the economy grew by a cumulative 62 percent. Poverty and well-being analyses already undertaken indicate a substantial fall in the poverty headcount from 69.4 percent of the population in 1996–97 to 54.1 percent in 2002–03 (MPF/IFPRI/PU 2004). While the trend is impressive, that over half the population continues to live in absolute poverty highlights the imperative for poverty reduction to remain at the heart of Mozambican policy.

This paper seeks to examine trends in inequality, particularly the extent to which economic growth in Mozambique has benefited the poor. Inconveniently, despite the pervasiveness in development discourse of the term "pro-poor," there is no consensus on its definition. Kakwani and Pernia (2000) suggest a narrow definition in which growth can be deemed pro-poor if the accompanying change in income distribution by itself reduces poverty. Yet, as Kraay (2004) notes, this is a rather restrictive notion, given that patterns of growth would not be deemed pro-poor if the income of the poor grew at a slower pace than the incomes of higher-income groups, even if rapid rates of poverty reduction had taken place.

A broader definition is that growth is pro-poor when the incidence of poverty falls (Ravallion and Chen 2003). However, this definition is also not without problems. It is questionable, for example, whether an annual 10 percent growth rate for the population as a whole should really be described as pro-poor if the real income growth of those below the poverty line was considerably smaller—for example, 1 percent—resulting in only a marginal reduction in absolute poverty and a significant increase in relative poverty. This paper attempts to take a nuanced view by considering the pattern of growth across the entire income distribution.

In this paper, two broad research questions are addressed: (1) What was the inequality profile of Mozambique in 2002–03? (2) How did the inequality profile of Mozambique change between 1996–97 and 2002–03? Static decomposition techniques are used to examine the pattern of inequality between and within different subgroups of the 2002–03 national household survey of consumption, known as the IAF02. In examining how inequality has changed over time, the IAF96 and IAF02 consumption

surveys are compared using standard inequality measures. The statistical significance of changes in inequality is tested using bootstrapped standard errors. This, coupled with an examination of the average annual growth rate in consumption across the population distribution, enables us to examine how broad-based the growth in consumption was between the two survey periods.

The methodology used in this paper is described in the following section, including the construction of the welfare measure, the inequality indexes employed, and the method used to estimate their standard errors. Section 3 presents national and subnational inequality results for Mozambique for the two surveys (1996–97 and 2002-03). The pattern of economic growth across the income distribution is also examined in this section. Discussion of the results and conclusions are presented in Section 4.

2. Methodology

Definition of Welfare Measure

This study builds on the analysis already undertaken as part of the second national assessment of poverty and well-being and uses consumption per capita as the welfare metric (MPF/IFPRI/PU 2004). As the current analysis is based on the estimates of real consumption calculated in the poverty assessment, an outline of the methodology is necessary.[3] Both the 1996–97 IAF and 2002–03 IAF were nationally representative surveys containing detailed information on expenditure for 8,250 and 8,700 households, respectively. In the analysis of both surveys, a cost of basic needs approach was employed to ascertain the absolute poverty lines (Ravallion 1994, 1998). Region-specific poverty lines were constructed, with the same 13 spatial regions used in both studies.

To obtain the poverty line in each region, food and nonfood basic needs were considered. To derive the food component of the line, the minimum caloric requirements

[3] The full methodology is presented in MPF/IFPRI/PU 2004.

of different groups of the population (for example, children, pregnant or lactating women, adult males) were ascertained and weighted to reflect the average region-specific household composition. In turn, the cost of buying the food necessary to satisfy the caloric requirements was calculated. As different commodities may be more or less expensive in different parts of the country, this food poverty line was calculated separately for (the same) 13 spatial regions in each of the surveys. As there is considerable spatial variation in relative food prices in Mozambique (Tarp et al. 2002), the composition of the food poverty line bundles was also allowed to vary across the 13 regions.

In updating the 1996–97 poverty lines for use with the 2002–03 data, it was necessary to consider the likely impact of temporal variation in relative prices. Considerable relative price changes took place between the two survey periods in all of the 13 spatial domains (that is, in many cases a food commodity that was a best value in 1996–97 was no longer so in 2002–03). This means there was considerable incentive for poor households to change their consumption choices between the two survey periods. Under this scenario, poverty headcounts would be overestimated in the latter sample if this substitution were ignored and the same baskets of goods used to derive the poverty lines in 1996–97 were adopted in 2002–03. Such overestimations would have considerable ramifications for the accuracy of comparisons between the two surveys. To overcome these problems, a flexible approach to estimating the poverty line in 2002–03 was adopted, with a different basket of food being used to derive the poverty line in 2002–03 than in 1996–97.

However, in using a flexible approach, one faces the challenge of ensuring that the basic needs poverty bundles reflect the same standard of living, both across space in 2002–03 and relative to the bundles chosen in 1996–97 (Ravallion and Lokshin 2003). Utility-consistent food poverty lines were estimated using the approach described in Arndt and Simler (2005). In particular, an information theoretic criterion was employed to adjust the food bundles for 2002–03 so that these bundles satisfied both spatial and

temporal revealed preference conditions, while adhering as closely as possible to the consumption patterns revealed in the surveys.

Turning to nonfood, even the very poorest households allocate a nontrivial portion of their total consumption to nonfood items. The nonfood component of the poverty line was estimated based on the average nonfood budget share of households whose total expenditure is close to the level of the food poverty line. To ensure an adequate sample, the expenditure pattern of all households whose per capita total consumption was between 80 and 120 percent of the food poverty line was examined. From these households, the cost of the minimum nonfood bundle was then estimated nonparametrically as the weighted average nonfood expenditure. A triangular weighting scheme was used in constructing the average, giving greater weight to observations the closer they were to the food poverty line (see Hardle 1990). This method was used in both the 1996–97 IAF and the 2002–03 IAF to derive the nonfood share of the poverty line value in the 13 spatial areas. Table 1 shows the food, nonfood, and total poverty lines for each of the 13 spatial domains. The table also shows the poverty headcount ratio, and associated standard errors, for rural and urban areas in each province.

The poverty line for each of the 13 spatial areas was calculated as the sum of the food and nonfood poverty lines. To derive per capita daily consumption values, household consumption was divided equally among all household members.[4] To obtain real per capita consumption values, these figures were then deflated using the poverty line for the appropriate spatial area. Representing actual consumption as a proportion of the appropriate poverty line facilitates comparisons between spatial areas within the same survey and across the two survey periods. For example, the total poverty line in 2002–03 in rural Nampula was 5,972 meticais (MZM) per day and in urban Gaza Inhambane, it was MZM 10,721 per day. Thus, a person who consumed exactly MZM 5,972 per day

[4] As a form of sensitivity analysis, we also conducted the analysis using consumption per adult equivalent unit (AEU), with the AEU scale based on food energy requirements. The results are almost identical, which is not surprising. Although changing the denominator leads to considerable reordering of households, the net effect on the indexes is almost zero at the level of aggregation presented here (such as national, regional, provincial, rural, urban, broad subgroups, expenditure percentiles).

Table 1—Poverty lines, headcount ratios, and standard errors, by province and zone of residence, 2002-03

Poverty line region	Poverty line			Poverty headcount ratio	Standard error of headcount
	Food poverty line	Nonfood poverty line	Total poverty line		
	(meticais)				
Rural					
1 Niassa	5,434	1,665	7,099	0.529	0.064
Cabo Delgado	5,434	1,665	7,099	0.651	0.033
2 Nampula	4,471	1,501	5,972	0.578	0.037
3 Zambézia	4,155	1,318	5,473	0.445	0.051
Sofala	4,155	1,318	5,473	0.338	0.029
4 Tete	5,629	1,304	6,933	0.590	0.048
Manica	5,629	1,304	6,933	0.404	0.057
5 Inhambane	6,614	2,394	9,008	0.836	0.024
Gaza	6,614	2,394	9,008	0.617	0.031
6 Maputo Province	11,801	4,963	16,764	0.812	0.047
Urban					
7 Niassa	7,540	2,690	10,231	0.488	0.060
Cabo Delgado	7,540	2,690	10,231	0.566	0.098
8 Nampula	4,853	1,807	6,661	0.449	0.070
9 Zambézia	6,591	2,183	8,775	0.452	0.071
Sofala	6,591	2,183	8,775	0.396	0.053
10 Tete	7,145	2,545	9,690	0.645	0.060
Manica	7,145	2,545	9,690	0.491	0.051
11 Inhambane	7,264	3,457	10,721	0.705	0.044
Gaza	7,264	3,457	10,721	0.557	0.047
12 Maputo Province	11,898	6,398	18,296	0.618	0.035
13 Maputo City	12,224	7,291	19,515	0.536	0.031

and lived in rural Nampula and a person living in Inhambane City (where the cost of living is much higher) who consumed MZM 10,721 per day would be viewed as having the same standard of living, exactly 100 percent of the relevant poverty line.[5]

[5] While this works well for people at or around the poverty line, the use of this form of deflator is less appropriate for comparing wealthy households from different regions. This is because the poverty line is derived from the goods that make up a poverty line basket, which is based on consumption patterns of poor households. To continue with the example given above, it is unlikely that a wealthy individual in rural Nampula, consuming MZM 597,200 a day, is really as wealthy in real consumption terms as a person in Inhambane City who consumes MZM 1,072,100 a day. The goods such an individual consumes are unlikely to be more expensive in Inhambane City in the same way goods that make up the poverty line basket of goods would be.

The Gini and Generalized Entropy Measures of Inequality

To derive an inequality profile for Mozambique, the Gini and generalized entropy (GE) inequality measures were used. From its first proposal in 1921, the Gini coefficient or index has been one of the most widely used measures of social and economic inequality. The Gini index was proposed as a summary statistic of the dispersion of a distribution, taking on values between zero and one with zero interpreted as no inequality. There are several ways of expressing the Gini coefficient. We use the formula found in Jenkins (1991),

$$G = 1 + \frac{1}{N} - \frac{2}{mN^2}\sum_{i=1}^{N}(N - i + 1)\, y_i, \tag{1}$$

where m is the arithmetic mean of consumption per capita and persons are ranked in ascending order of consumption per capita, y_i.

The GE set of inequality measures were also used to explore the distribution of the consumption in the sample. This class of measures takes the form given in equations 2a, 2b, and 2c below.

$$GE(c) = \frac{1}{c(c-1)}\sum_i f_i\left[\left(\frac{y_i}{\mu}\right)^c - 1\right], \quad \text{for } c \neq 0,\ 1; \tag{2a}$$

$$GE(0) = -\sum_i f_i \log\left(\frac{y_i}{\mu}\right), \quad \text{for } c = 0; \text{ and} \tag{2b}$$

$$GE(1) = \sum_i f_i \left(\frac{y_i}{\mu}\right)\log\left(\frac{y_i}{\mu}\right), \quad \text{for } c = 1. \tag{2c}$$

In the GE equations, f_i is the population share of household i, y_i is per capita consumption of household i, μ is average per capita consumption, and c is a weighting

parameter. Lower values of *c* are associated with greater sensitivity to inequality among the poor, and higher values of *c* place more weight on inequality among the rich. The most common values of *c* used are 0, 1, and 2, which we will refer to as *GE*(0), *GE*(1), and *GE*(2).[6] An advantage of the GE measures over the Gini coefficient is that, in being additive on *i*, they can be additively decomposed into between-group and within-group components of inequality. The decomposition of total inequality *(I)* into two parts for the *GE*(1) measure is given in equation (3) below.

$$GE(1) = \left[\sum_j g_j \left(\frac{\mu_j}{\mu}\right) \log\left(\frac{\mu_j}{\mu}\right)\right] + \sum_j GE_j\, g_j \left(\frac{\mu_j}{\mu}\right) \quad . \tag{3}$$

In equation (3), *j* refers to subgroups, g_j refers to the population share of group *j,* and GE_j refers to inequality within group *j*. The between-group component of inequality (I_b) is captured by the first term in the right-hand side of the equation. This is inequality in mean consumption between the subgroups and reflects what the level of inequality in the population would be if everyone within each subgroup had the same (the group average) consumption level μ_j. The second term on the right-hand side of the equation reflects within group inequality (I_w), or what the overall inequality level would be if there were no differences in mean consumption across groups, but there was inequality within each group. Total inequality is the sum of I_b and I_w.

At this point, there are features of the data used in this study, and the inequality measures more generally, that merit comment. First, the data are not panel data but are two representative cross-sections. We have snapshots at two points in time of representative samples of households, but we cannot say anything about poverty or inequality dynamics at the household level. That is, we do not know how much households are moving in or out of poverty or how much reordering is taking place in the expenditure distribution. Second, all of the inequality measures used is "anonymous," in

[6] The *GE*(1) measure is also known as the Theil entropy measure, and the *GE*(0) measure is also referred to as the Theil L or mean log deviation measure.

that they only consider the distribution of household expenditure at a point in time and not movements of a given household within that distribution. As such, they are appropriate for the cross-sectional data used in this paper, but they also have an inherent weakness in capturing a broader concept of inequality.

As a somewhat extreme illustration of this weakness, consider an economy in which expenditure is distributed unequally in time t. But expenditure levels are not static, and in a subsequent period ($t + 1$), the ordering of households by income is completely inverted, with the household that was poorest in time t being the richest in $t + 1$, and vice versa. The same applies to the second poorest (richest) household, and so on down the expenditure distribution. Furthermore, assume that not only is the ordinal ranking of households inverted, but the cardinal ranking is as well. Any of the inequality measures shown above would only reflect the inequality observed in the cross-section and not detect the economic mobility through which households move up and down the expenditure distribution over time. Indeed, *average* household expenditure over the two periods would be much more equal than indicated by the inequality indexes estimated from the cross-sections. If panel data were available, it would be possible to estimate inequality indexes based on households' average expenditures over time, but panel expenditure data are not presently available in Mozambique.

For tests of statistical inference, a bootstrap procedure was used to generate estimates of the standard errors of the Gini and $GE(1)$ inequality measures. The bootstrap samples were drawn in a manner that mimicked the cluster sample design of the IAF surveys. That is, p clusters were randomly drawn, with replacement, where p is the number of primary sampling units in the survey. When a cluster is drawn, all of the households in that cluster are drawn. Because the bootstrap sampling is done with replacement, each cluster (or household) may appear one or more times in a given bootstrap sample or not at all. Inequality indexes are calculated for each bootstrap sample. The process is repeated 500 times. The standard deviation of the inequality indexes over the 500 replications is a consistent estimator of the standard error of the

inequality index. The point estimates of the inequality indexes are calculated from the original, nonbootstrapped sample.

3. Results

2002–03 Inequality

The national Gini coefficient based on the 2002–03 IAF is 0.42, which represents a fairly high degree of inequality, though it is not out of line with other Sub-Saharan African countries.[7] Average consumption in the highest quintile is eight times the average consumption in the poorest quintile. In fact, mean consumption in the poorest quintile is only 39 percent of the poverty line, that is, less than half of what is required to meet basic needs. Mean consumption per capita for the entire population in 2002–03 is 128 percent of the poverty line (see Table 2). Consequently, at this level of total consumption, everyone would live above the absolute poverty line if there were no inequality in the country.[8]

Table 2—Mean comsumption, by quintiles, 2002-03

	Mean consumption	
Population quintile	As proportion of poverty line	As proportion of highest quintile's mean consumption
1	0.39	0.13
2	0.66	0.22
3	0.94	0.30
4	1.32	0.43
5	3.08	1.00
Mean	1.28	0.41

Inequality varies considerably among different regions, provinces, and areas (see Table 3). In rural areas, the Gini coefficient was just 0.37, compared with 0.48 in urban

[7] For example, Christiaensen, Demery, and Paternostro (2003) report Gini coefficients of 0.37 for Ghana, 0.38 for Madagascar, 0.38 for Uganda, 0.47 for Nigeria, and 0.50 for Zambia.

[8] As indicated earlier, this contrasts with the situation in 1996–97, where mean real consumption was below the poverty line.

areas. In other words, consumption in rural areas was far more equal across the sample households than in urban areas, a familiar result because urban areas tend to be more economically heterogeneous. At the regional level, inequality was lowest in the north and center, with estimated Gini coefficients of 0.39 in each. Inequality was much higher in the south of the country, particularly in Maputo City, where the estimated Gini coefficient was 0.52.

Table 3—Inequality estimates at the national, rural, urban, and regional level, 2002-03

	Mean consumption (as proportion of poverty line)	Gini	*GE*(0)	*GE*(1)	*GE*(2)
National	1.28	0.42	0.30	0.37	0.99
Rural	1.15	0.37	0.24	0.27	0.55
Urban	1.53	0.48	0.39	0.50	1.45
North	1.22	0.39	0.25	0.35	1.13
Central	1.40	0.39	0.27	0.31	0.65
South[a]	1.00	0.44	0.33	0.40	0.97
Maputo City	1.69	0.52	0.46	0.60	1.97

[a] Excluding Maputo City.

The GE inequality measures parallel the patterns revealed by the Gini coefficients. Consumption is more equal in rural areas, while the south, particularly Maputo City, exhibits the highest inequality in the country (whichever GE measure is used). Interestingly, the *GE*(2) value for Maputo City is nearly twice that of the national average. This indicates that the higher inequality in Maputo City is attributable to the presence of a small but particularly well-off subgroup of citizens.[9]

Inequality by province was also examined (Table 4). The pattern of inequality within provinces tends to follow the regional figures, with northern and central provinces enjoying somewhat lower levels of inequality than the southern provinces. Provinces with inequality above the national average were Cabo Delgado, Inhambane, Sofala, and Maputo (province and city). Given the higher levels of inequality recorded in urban areas

[9] Although this subpopulation was extremely rich relative to other sample households, in Western terms there were no super-rich households sampled. The highest real consumption per capita observed in the 2002–03 IAF was less than US$100 per day.

generally, it is not surprising that inequality was higher in Sofala Province than other central provinces, given it is home to the second largest city in the country, Beira. Inhambane was the province with the highest poverty headcount in the 2003-03 IAF and also the province with the lowest mean consumption. The high inequality in general, and particularly the *GE*(0) figure, suggest the presence of a significant minority of extremely poor households in the province.

Table 4—Estimated inequality measures, by province, 2002-03

Region/province	Mean consumption (as proportion of poverty line)	Percent of population that is rural	Gini	*GE*(0)	*GE*(1)	*GE*(2)
Northern						
Niassa	1.29	80.8	0.36	0.22	0.26	0.48
Cabo Delgado	1.27	77.5	0.44	0.35	0.62	3.04
Nampula	1.18	59.7	0.36	0.21	0.24	0.33
Central						
Zambézia	1.35	89.2	0.35	0.21	0.23	0.32
Tete	1.06	84.9	0.40	0.29	0.30	0.47
Manica	1.41	63.9	0.40	0.29	0.30	0.45
Sofala	1.81	60.1	0.43	0.31	0.41	1.13
Southern						
Inhambane	0.77	77.9	0.44	0.34	0.40	0.80
Gaza	1.24	74.3	0.41	0.28	0.38	1.11
Maputo[a]	1.01	38.4	0.43	0.31	0.36	0.65
Maputo City	1.69	00.0	0.52	0.46	0.60	1.97
National	1.28	67.9	0.42	0.30	0.37	0.99

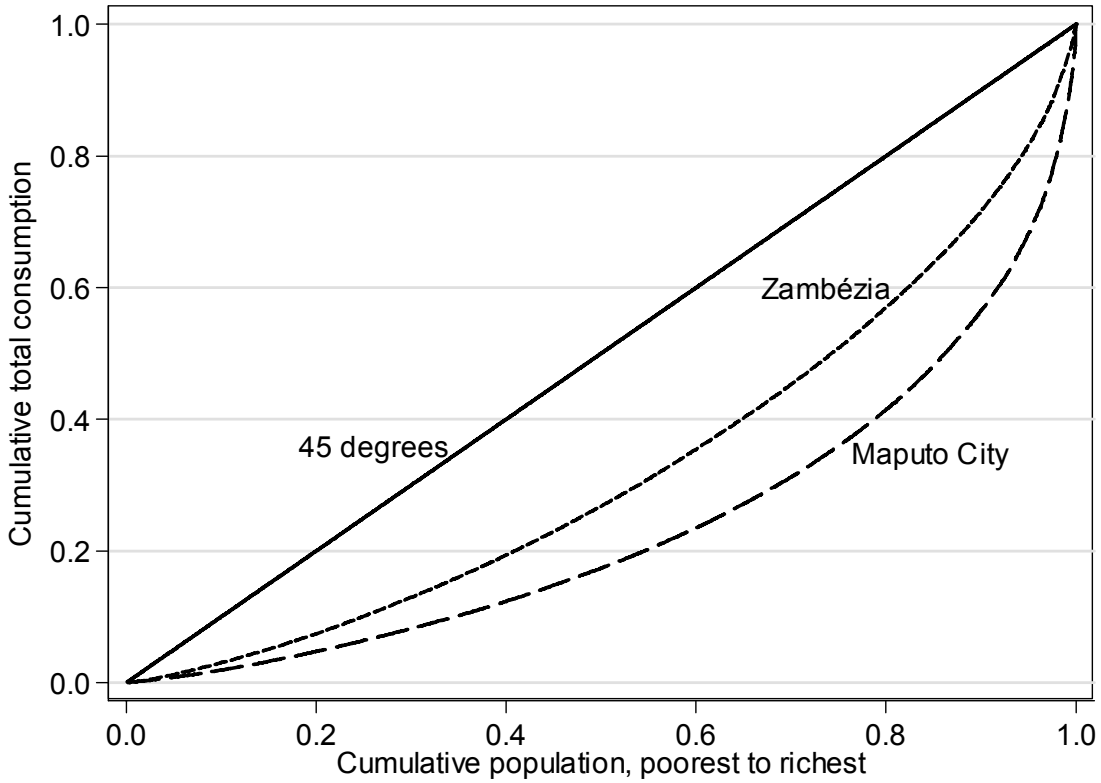
[a] Excluding Maputo City.

As noted in INE (2004), Cabo Delgado posed a considerable sampling problem in both IAF surveys. In 2002–03, the standard error on the value of mean consumption, measured as a percentage of the mean value, exceeded the value estimated for most other provinces by a factor of three to four, resulting in a very wide confidence interval on the value of mean consumption for Cabo Delgado. This high standard error was driven primarily by a few enumeration areas containing households with consumption levels far above the average for the province and indeed the country as a whole. While the high consumption of these few households matters little for poverty headcount estimates (because nonpoor households receive zero weight in most poverty measures), they exert

an extremely strong influence on measures of inequality. The *GE*(2) estimate for Cabo Delgado, at over three times the national average, certainly suggests that much of the inequality in Cabo Delgado is attributable to the sample's inclusion of a small group of unusually wealthy households.

In Figure 1, the Lorenz curves for Zambézia and Maputo City—the provinces with lowest and highest Gini coefficients, respectively—are presented along with a 45-degree line. The more equal distribution in Zambézia is demonstrated by the Lorenz curve being closer to the 45-degree line. As can also be seen in Figure 1, in Zambézia the richest 25 percent of the population consume 49 percent of the total consumption, while in Maputo City, the richest 25 percent of the population account for more than 64 percent of the total consumption in the city.

Figure 1—Lorenz curves for Zambézia and Maputo City, 2002-03



Changes in Inequality between the IAF 1996–97 and the IAF 2002–03

Consumption inequality at the national level has slightly increased between the two study periods, with the Gini coefficient rising from 0.40 in 1996–97 to 0.42 in 2002-03 for the sample as a whole. However, as the Lorenz curves for the two samples in Figure 2 illustrate, this increase in inequality at the national level is moderate. In the 1996–97 IAF, the poorest 50 percent of the population consumed 23.9 percent of the total consumption in the sample. In the 2002–03 IAF, the poorest 50 percent consumed 23.3 percent of total consumption. The GE measures also show a moderate increase in inequality in 2002–03, compared with 1996–97 (Table 5).

Figure 2—Lorenz curves for 1996-97 and 2002-03 IAF surveys

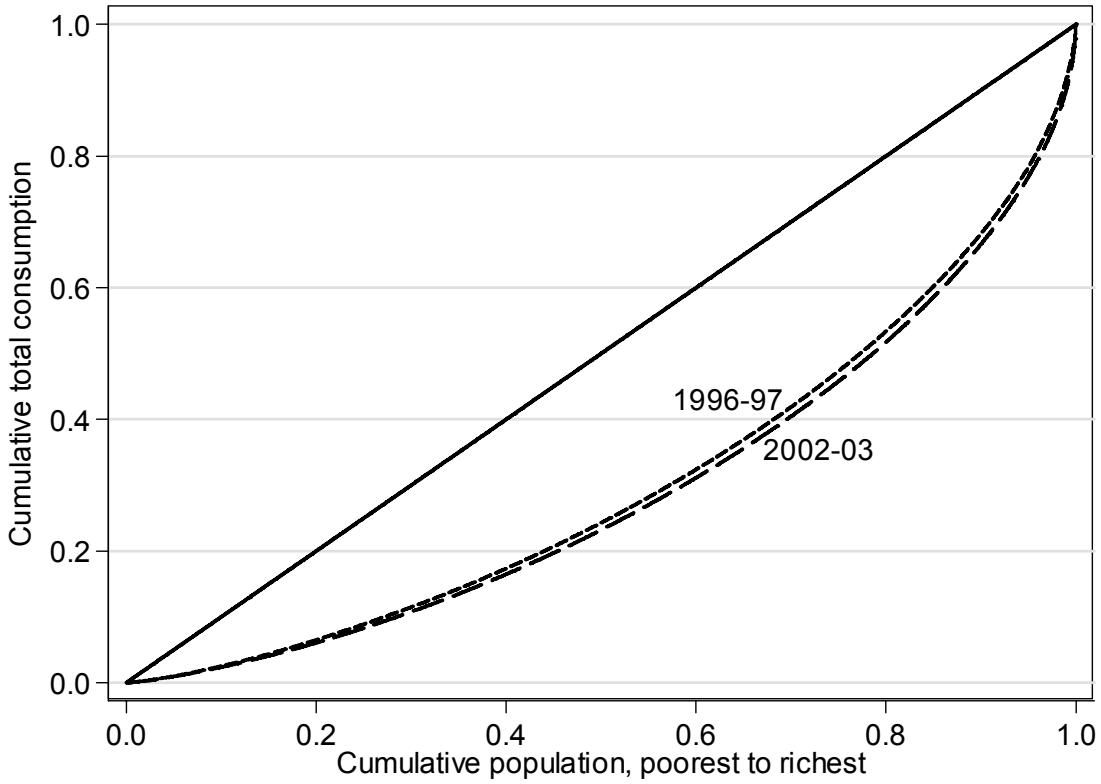


Table 5—Changes in inequality at the national level over time

Inequality measure	1996–97	2002–03
Gini	0.40	0.42
GE(0)	0.27	0.30
GE(1)	0.31	0.37
GE(2)	0.59	0.99
Mean consumption (as proportion of poverty line)	0.97	1.28

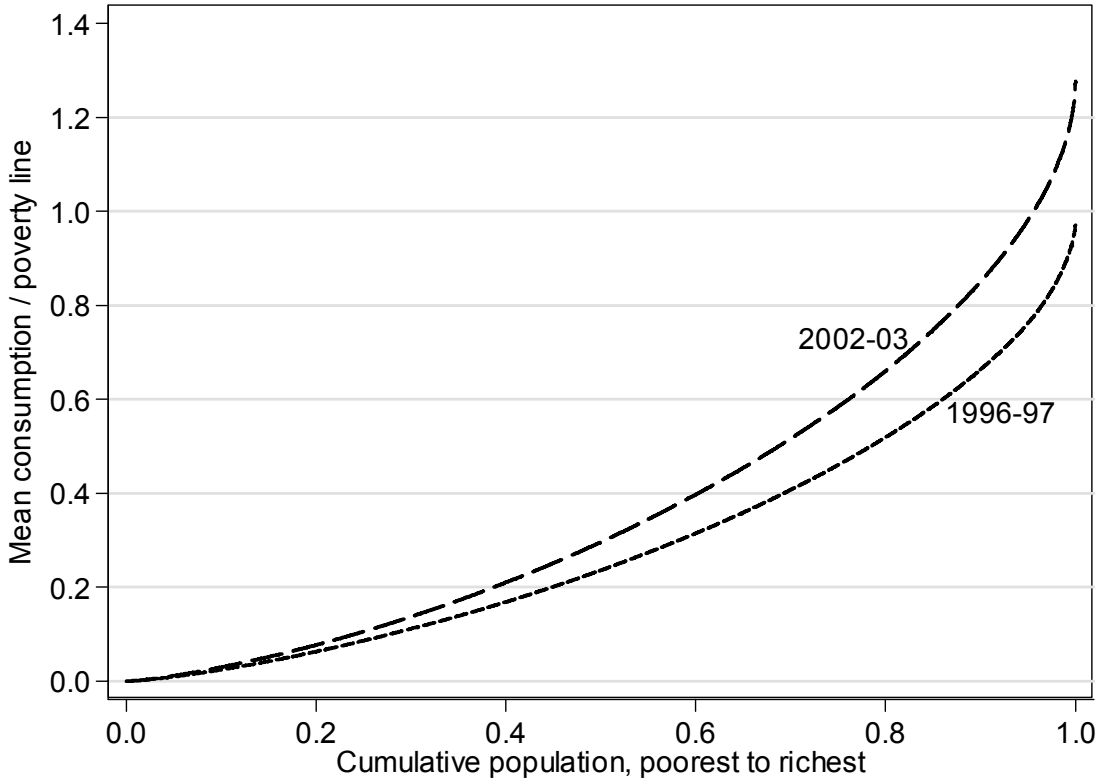
Of particular concern for poverty reduction efforts is the growth in consumption among the percentage of the population who fell below the poverty line in 1996–97. While inequality has increased moderately, there has been a rapid increase in the mean real consumption between the two sample periods. As noted, mean consumption per capita in 1996–97 was below the poverty line. In the 2002–03 IAF, the mean consumption in the sample was 128 percent of the poverty line, which represents a 31 percent increase in mean real consumption between the two time periods.

Of course, this increase in the mean consumption for the sample could, in principle, result solely from increases in consumption among the top 50 percent of the population. To explore the growth in consumption across the full distribution, the generalized Lorenz curves for the two data sets were drawn (see Figure 3). Unlike standard Lorenz curves, generalized Lorenz curves take into account not only the relative distribution of consumption, but also the absolute level, and can therefore be used to examine how consumption has changed across the distribution. The horizontal axis is the same as for standard Lorenz curves, but the vertical axis is rescaled by multiplying the cumulative share of total consumption times mean consumption per capita for the entire sample. Therefore, when p is 100 percent of the population, the y-value is equal to the mean real consumption per capita in the sample. Figure 3 shows that the 2002–03 generalized Lorenz curve dominates the 1996–97 curve.[10] In other words, consumption is higher at each percentile point in the distribution in 2002–03 than it was in 1996–97.

[10] Individual households could, of course, be worse off, implying that they fell to a lower percentile in the consumption distribution over the period.

For reduction of absolute poverty, that households at all percentiles consumed more in the 2002–03 IAF than in the 1996–97 IAF is arguably more significant than the marginal increase in inequality.

Figure 3—Generalized Lorenz curves for 1996-97 and 2002-03 IAF surveys



The change in inequality within subpopulations between the two survey periods was also examined. As shown in Table 6, the increase in inequality within both rural and urban areas is negligible. Changes in inequality measures within provinces varied somewhat. In two cases, Nampula and Manica, inequality marginally fell between the two sample periods. Inequality increased slightly in five provinces: Niassa, Zambézia, Sofala, Gaza, and Maputo Province (excluding Maputo City), and increased more rapidly in four others: Tete, Inhambane, Cabo Delgado, and Maputo City. In fact, the rapid increase in inequality in Cabo Delgado and Maputo City accounts for the majority of the

rise in consumption inequality seen nationally. Given the sampling problems in Cabo Delgado already discussed, it would be unwise to read too much into the sharp rise in inequality there.[11] The sharp rise in inequality in Maputo City gives more cause for concern, especially considering that the poverty headcount has remained essentially flat in the capital city between the two sample periods, despite the increase in mean consumption. The Gini coefficient has risen in Maputo City from 0.44, already the highest of all the provinces in 1996–97, to 0.52 in 2002–03. Moreover the *GE*(2) value for Maputo (not shown in Table 6) more than doubled from 0.95 to 1.97, which indicates

Table 6—Changes in inequality over time

Area	Mean consumption (proportion of poverty line) 2002–03	Increase in real consumption from 1996–97	Gini		*GE*(1)	
			1996-97	2002-03	1996-97	2002-03
		(percent)				
National	1.28	32	0.40	0.42	0.31	0.37
Rural	1.15	26	0.37	0.37	0.26	0.27
Urban	1.53	24	0.47	0.48	0.44	0.50
North	1.22	20	0.38	0.39	0.29	0.35
Center	1.40	63	0.37	0.39	0.27	0.31
South	1.15	4	0.43	0.47*	0.37	0.50**
Niassa	1.29	45	0.35	0.36	0.22	0.26
Cabo Delgado	1.27	8	0.37	0.44	0.27	0.62
Nampula	1.18	20	0.39	0.36	0.30	0.24
Zambézia	1.35	44	0.32	0.35	0.20	0.23
Tete	1.06	49	0.35	0.40	0.21	0.30*
Manica	1.41	22	0.41	0.40	0.36	0.30
Sofala	1.81	207	0.40	0.43	0.32	0.41
Inhambane	0.77	-1	0.38	0.44	0.31	0.40
Gaza	1.24	12	0.38	0.41	0.27	0.38
Maputo[a]	1.01	-6	0.42	0.43	0.35	0.36
Maputo City	1.69	10	0.44	0.52*	0.41	0.60*

[a] Excluding Maputo City.

** = Difference between the two periods is statistically significant at the 1 percent level; * = difference between the two periods is statistically significant at the 5 percent level.

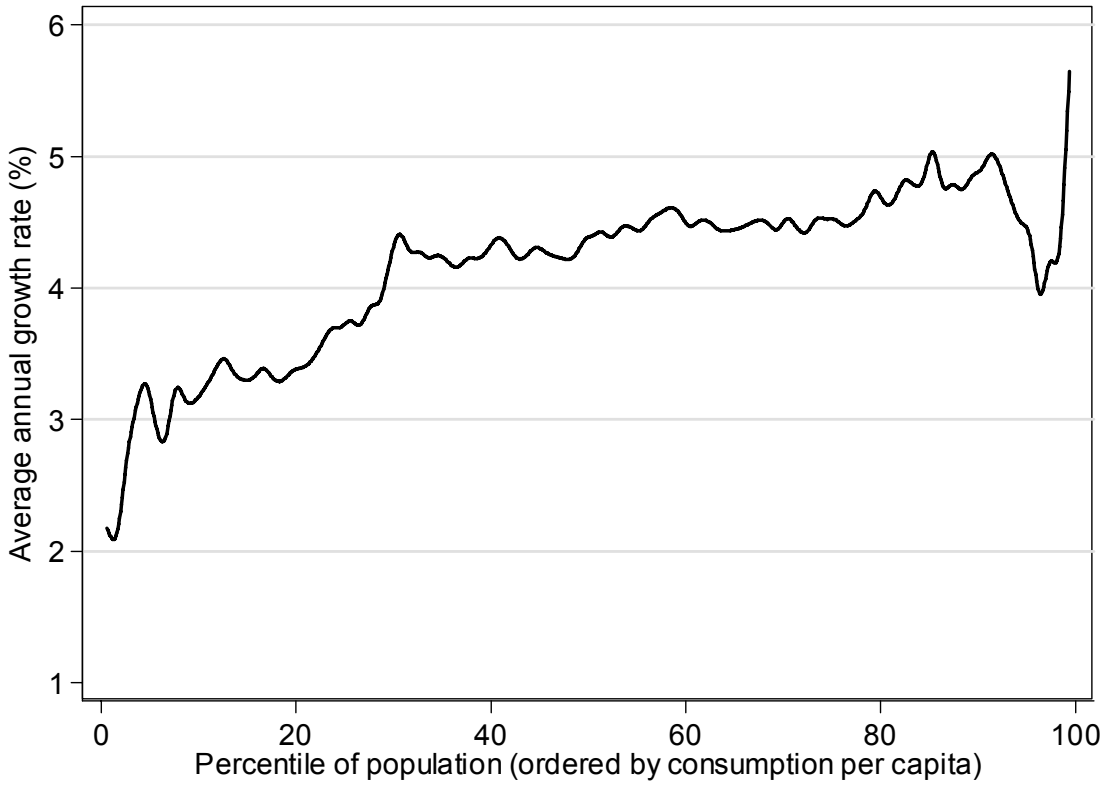
[11] Indeed, the *GE*(2) inequality measure, which gives higher weight to richer households, has increased sixfold.

a sharp rise in the consumption growth of the richest households relative to the sample as a whole. Of course, given Maputo City's capital status, with all the associated economic trappings this brings, that it is home to the richest households is no surprise. However, it is also home to a large impoverished population, including squatters, and is the final destination for many rural-urban migrants. What these results indicate therefore is that the benefits of economic growth in the city in recent years may not be reaching the poorer sections of society.

As shown in Table 6, most of the changes in the Gini coefficient and *GE*(1) index at the national and subnational levels are not statistically significant. The increase in inequality in the southern region is significant, driven in part by the increased inequality within Maputo City, which is also significant. Tete is the only other province where increased inequality is significant, and that only for the *GE*(1).

Another way to examine the relationship between changes in inequality and poverty reduction over time is to examine the rate of growth in consumption for different percentiles of the sample population. To do this, both samples were ordered from poorest to richest, and the difference in consumption calculated for each percentile. The annual average growth rates were calculated by taking the differences in consumption between the two samples for each percentile. The increase in mean consumption (from 97 to 128 percent of the poverty line) reflects an average annual growth rate in consumption of 4.6 percent. As illustrated in Figure 4, the average annual growth rate was higher among the nonpoor, thus increasing total inequality. Naturally, the extent of poverty reduction is less than if the same average growth rate had occurred with no change in inequality, but the difference is small. For example, had all percentiles of the population enjoyed the mean rate of growth in consumption, measured poverty in 2002-03 would only have fallen by a further percentage point to 53.0 percent of the population, rather than the 54.1 percent it actually stood at. At the national level we conclude that broad-based consumption growth has occurred.

Figure 4—Growth rate in consumption per capita, by percentile, 1996-97 to 2002-03



Inequality Decomposed by Household Characteristics

The *GE*(1) estimates of inequality were decomposed into within-group and between-group components for a set of household characteristics. Of the total *GE*(1) inequality in the sample, 5.4 percent is accounted for by differences in consumption between provinces, leaving 94.6 percent of inequality to be explained by inequalities within the provinces. These findings are important as they demonstrate that the difference in mean consumption between provinces is not the major explanation for inequality within the sample.[12]

[12] That only 5.4 percent of total inequality can be attributed to differences in the provincial means of consumption may appear surprising. Because of the additive nature of the decomposition, it follows that, other things equal, the between-share increases with the number of subgroups. Therefore, at the national level, inequality is 100 percent within, and at the individual level, inequality is 100 percent between.

We also decompose inequality by subgroup, based on key household characteristics. Table 7 disaggregates the total 2002–03 sample according to four characteristics: area of residence (rural or urban), sex of the head of household, literacy of the head of household, and whether or not the head of household's principal sector of employment is agriculture. This yields 16 subgroups. As shown in Table 7, only 10 percent of total inequality is explained by differences in the means of these 16 subgroups, whereas 90 percent of inequality arises from inequality within the subgroups.

Table 7—Static decomposition of inequality, by subgroups, using the *GE*(1) measure, 2002-03

Characteristics of the household and head of household	Population share	*GE*(1) for subgroup	Percent of total
Rural, male, agricultural, illiterate	25.0	0.221	
Rural, male, agricultural, literate	22.6	0.199	
Rural, male, nonagricultural, illiterate	1.5	0.182	
Rural, male, nonagricultural, literate	6.7	0.427	
Rural, female, agricultural, illiterate	11.4	0.248	
Rural, female, agricultural, literate	1.8	0.319	
Rural, female, nonagricultural, illiterate	0.1	0.188	
Rural, female, nonagricultural, literate	0.2	0.335	
Urban, male, agricultural, illiterate	2.9	0.141	
Urban, male, agricultural, literate	4.4	0.496	
Urban, male, nonagricultural, illiterate	1.4	0.181	
Urban, male, nonagricultural, literate	15.7	0.523	
Urban, female, agricultural, illiterate	2.7	0.208	
Urban, female, agricultural, literate	1.0	0.683	
Urban, female, nonagricultural, illiterate	0.9	0.222	
Urban, female, nonagricultural, literate	1.7	0.383	
Within-group inequality		0.331	89.6
Between-group inequality		0.038	10.4

By contrast, some 7.2 percent of total inequality was accounted for by differences in consumption between those households whose household head's principal livelihood was in agriculture and those whose employment was nonagriculturally based.[13] This is an important finding as it demonstrates that there is considerably more inequality between agricultural and nonagricultural households than between rural and urban

[13] That 7.2 percent of total inequality is accounted for by the agricultural/nonagricultural household head variable is notable, given that this is a simple two-category variable.

households per se. A key reason for this is the large number of urban households whose heads reported agriculture to be their chief source of income. Of the 4,005 household heads defined as urban dwellers in the 2002–03 survey, 1,193 identified agriculture as their chief income source. Notably the mean consumption for these households was just below the poverty line (at 99 percent of the poverty line). By contrast, the other 2,812 urban households whose heads' main income source was nonagricultural had a mean consumption of 178 percent of the poverty line. A similar difference emerges between rural households whose heads' main income source was agriculture and those whose income was nonagricultural, though there are relatively few of the latter group (see Table 8). Nevertheless, as the high standard deviations suggest, there is considerable inequality between households within these groups, particularly those households whose heads' main income source is nonagricultural.

Table 8—Rural and urban agricultural and nonagricultural households mean consumption, 2002-03

Grouping	Number of households	Mean consumption (as proportion of poverty line)	Standard deviation
Urban nonagricultural head	2,812	1.78	3.00
Urban agricultural head	1,193	0.99	1.23
Rural nonagricultural head	745	1.55	2.27
Rural agricultural head	3,950	1.08	0.87

Changes over time in inequality between subpopulations were also observed. The amount of consumption inequality in the sample explained by differences between living in rural and urban areas has remained more or less the same between the two sample periods (see Table 9). By contrast, the amount of inequality accounted for by differences in mean consumption between individuals living in different provinces and regions was far less in the 2002–03 survey. In 1996–97, the inequality between provinces accounted for 8.0 percent of the total inequality. By 2002–03, inequality between provinces only accounted for 5.4 percent of total inequality. This is important as it indicates that

inequality between provinces and regions has actually declined between the two survey periods.[14]

Table 9—Static decompositions, by subgroups, for both samples, using the *GE*(1) measure

Subgrouping	Percent of total inequality in sample accounted for in 1996–97	Percent of total inequality in sample accounted for in 2002–03
Rural-urban	2.6	2.5
Region	3.8	2.5
Province	8.0	5.4

4. Conclusions

The pattern of growth in Mozambique between 1996–97 and 2002–03 has benefited the poor to a considerable extent. The proportion of the population living below the poverty line has fallen by 15 percentage points. Moreover, all percentiles of the population have seen their consumption per capita grow in real terms at a rate of more than 3 percent annually during this period. Nevertheless, though all sections of society have enjoyed a rapid annual increase in consumption, the rate of growth in consumption has been slightly higher for richer households. This means that point estimates of inequality have increased, usually moderately and without statistical significance, with the Gini coefficient rising from 0.40 in 1996–97 to 0.42 in 2002–03.

In determining whether growth in Mozambique has been pro-poor, it is clear that this depends on what definition is used. Certainly growth in Mozambique has been broad-based, as it has benefited all percentiles of the population and the change in inequality measures at the national level have not been significant. Yet, using the definition given by Kakwani and Pernia (2000), in which growth is deemed pro-poor if the accompanying change in income distribution by itself reduces poverty, growth in

14 Excluding the Maputo City households, the amount of total inequality explained by differences in the mean consumption between provinces fell from 8.0 percent to 5.9 percent in the 1996-97 IAF, compared to a fall of just 0.1 percent from 5.4 percent in 2002–03.

Mozambique would not be deemed pro-poor. Given the 15 percentage point fall in the poverty headcount, this seems somewhat unintuitive. Indeed, using the more popular definition proposed by Ravallion and Chen (2003), that growth is pro-poor when the poverty incidence falls, one must conclude that the pattern of growth in Mozambique between 1996–97 has been pro-poor.

Interestingly, the use of the entropy class of inequality measures indicates inequality in real consumption between provinces and regions has diminished over time, which is in contrast to many popular claims. Nevertheless, the rapid rise in inequality observed in Maputo City is of growing concern and indicates the pattern of economic growth in the city in recent years may not be benefiting the poorer sections of society.

This paper has sought to describe the pattern of change in inequality in Mozambique rather than state the underlying reasons for the changes observed. Clearly, it is imperative that attention now turns to addressing these issues and devising policies to ensure that the growth in Mozambique continues to benefit the poorest sections of society.

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