

Explaining Poverty and Inequality in Zambia

A Semi-parametric approach

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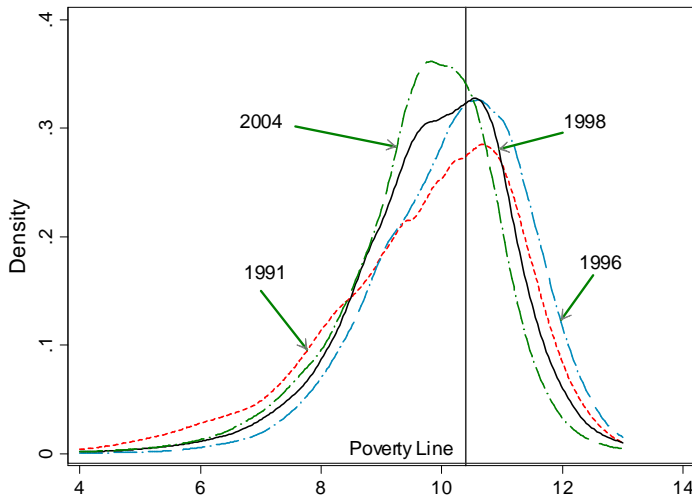
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Introduction

- The study analyzes the evolution of inequality and poverty in Zambia
- Over time Inequality decreased while poverty increased between 1991 and 2004
- The Gini Coefficient reduced by 2.1 percent, the MLD by 10.7 and the Theil Index by 3 Percent
- Poverty Increase : FGT(0) by 13.4 percent, FGT(1) by 7.8 percent and FGT(2) by 1.1 percent
- But Changes more pronounced between 1991 and 1996 when Implementation of Economic Reforms was hastened
- Why this focus: Earlier research has focused primarily looking at the linkage between growth, inequality and poverty (eg. Thurlow and Wobst 2004 and Mulenga and Campenhout, 2008)
- So still gaps in looking at how microeconomic factors such as education, employment and economic returns affect inequality

Introduction: Changes in Consumption Distribution

Figure: Consumption Distribution 1991-2004



Introduction : Changes in Household Characteristics

- An increase in the proportion of households with heads with tertiary education by 4 percent from 1991 to 2004
- For the 2nd, 3rd and 4th consumption deciles, the average years of schooling increased by about 20 percent between 1991 and 2004
- While four upper deciles the average years of schooling increased but by only 10 percent.
- For employment states the proportion of household heads engaged in self employment increased from 59 percent in 1991 to 72 percent in 2004
- In the lowest consumption quintile, 76.9 percent of the households engaged in self employment in 1991 but this increased to 95.4 percent in 2004
- The proportion employed in public sector reduced and the reduction is higher in the lower quintile than in the top quintile of consumption
- An increase in the proportion of households residing in rural areas over time

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Data and Household Characteristics

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- Priority Survey of 1991 and LCMS of 1996 and 2004 conducted by the Central Statistical Office.
- Generally consumption questions remained the same over time

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- The advantage is that you have an idea on which part of the distribution is affected by each explanatory factor
- A key disadvantage is that it becomes difficult to implement with too many explanatory variables.

The distribution of consumption is conditioned on various attributes: e.g.,

$$f_{91}(Y) \equiv f(Y; t_Y = 91, t_{R|W,E,X} = 91, t_{W/E,X} = 91, t_{E|X} = 91, t_X = 91)$$

$$f_{04}(Y) \equiv f(Y; t_Y = 04, t_{R|W,E,X} = 04, t_{W/E,X} = 04, t_{E|X} = 04, t_X = 04)$$

$$\nabla f(Y) = f_{04}(Y) - f_{91}(Y)$$

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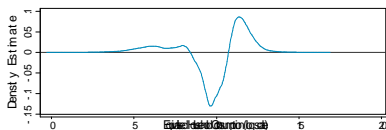
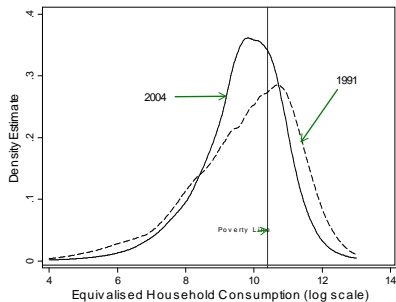
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- Adapted to studying inequality by others e.g. Cameron (2000), Daly and Valetta (2006)

Methodology: Changes in Consumption Distribution

Figure: Distribution of Real Consumption Expenditure 1991 & 2004



Sequential Density Decomposition Primary Order (reverse order in paper)
in Daly and Valetta (2006)

$$\begin{aligned} f_{01}(Y) - f_{04}(Y) = & \left[\begin{array}{l} f(Y; t_Y = 91, t_{W/E,X} = 91, t_{E|X} = 91, t_X = 91) \\ -f(Y; t_Y = 91, t_{W/E,X} = 91, t_{E|X} = 91, t_X = 04) \end{array} \right] \\ & + \left[\begin{array}{l} f(Y; t_Y = 91, t_{W/E,X} = 91, t_{E|X} = 91, t_X = 04) \\ -f(Y; t_Y = 91, t_{W/E,X} = 91, t_{E|X} = 04, t_X = 04) \end{array} \right] \\ & + \left[\begin{array}{l} f(Y; t_Y = 91, t_{W/E,X} = 91, t_{E|X} = 04, t_X = 04) - \\ f(Y; t_Y = 91, t_{W/E,X} = 04, t_{E|X} = 04, t_X = 04) \end{array} \right] \\ & + \left[\begin{array}{l} f(Y; t_Y = 91, t_{W/E,X} = 04, t_{E|X} = 04, t_X = 04) - \\ f(\hat{Y}^r; t_Y = 91, t_{W/E,X} = 04, t_{E|X} = 04, t_X = 04) \end{array} \right] \\ & + \left[\begin{array}{l} f(\hat{Y}^r; t_Y = 91, t_{W/E,X} = 04, t_{E|X} = 04, t_X = 04) \\ -f(Y; t_Y = 04, t_{W/E,X} = 04, t_{E|X} = 04, t_X = 04) \end{array} \right] \end{aligned}$$

- Example generating counterfactual for socio-demographic attributes:

$$\begin{aligned} & f(Y; t_Y = 91, t_{W/E, X} = 91, t_{E|X} = 91, t_X = 04) \\ = & \int \int \int f(Y|W, E, X, t_Y = 91) dF(W|E, X, t_{W|E, X} = 91) \times \\ & dF(E|X, t_{E|X} = 91) dF(X, t_X = 04) \\ = & \int \int \int f(Y|W, E, X, t_Y = 91) dF(W|E, X, t_{W|E, X} = 91) \times \\ & dF(E|X, t_{E|X} = 91) dF(X, t_X = 91) \Psi_X \end{aligned}$$

Where

$$\begin{aligned} \Psi_X(X) & \equiv \frac{dF(X, t_X = 04)}{dF(X, t_X = 91)} \\ & = \frac{pr(t_X = 04|X)}{pr(t_X = 91|X)} \end{aligned}$$

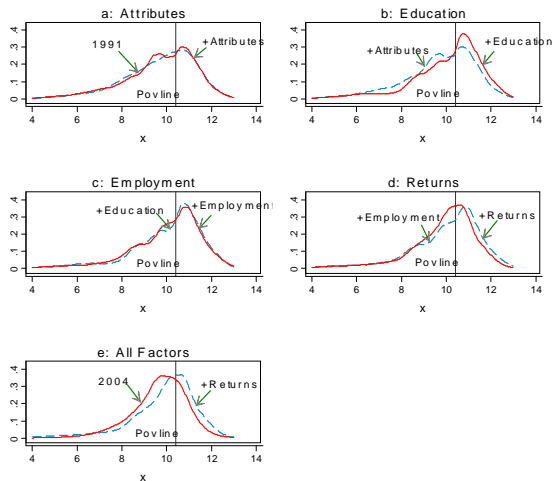
- Example generating counterfactual for education:

$$\begin{aligned}
 & f(Y; t_Y = 91, t_{R|W,E,X} = 91, t_{W|E,X} = 91, t_{E|X} = 04, t_X = 04) \\
 = & \int \int \int f(Y|R, W, E, X, t_Y = 91) dF(R|W, E, X, t_{R|W,E,X} = 91) \\
 & dF(W|E, X, t_{W|E,X} = 91) dF(E|X, t_{E|X} = 04) dF(X, t_X = 04) \\
 = & \int \int \int f(Y|R, W, E, X, t_Y = 91) dF(R|W, E, X, t_{R|W,E,X} = 91) \\
 & dF(W|E, X, t_{W|E,X} = 91) dF(E|X, t_{E|X} = 91) \Psi_{E|X} dF(X, t_X = 04)
 \end{aligned}$$

Where

$$\begin{aligned}
 \Psi_{E|X}(E, X) & \equiv \frac{dF(E|X, t_{E|X} = 04)}{dF(E|X, t_{E|X} = 91)} \\
 & = \sum_{j=1}^J I_j \frac{pr(E = j | t_{E|X} = 04)}{pr(E = j | t_{E|X} = 91)} \quad (1)
 \end{aligned}$$

Figure: Density Decomposition 1991-2004



Results: Looking at percentiles

- Changes in education lead to a higher increase in consumption at lower levels than at higher levels
 - education changes lead to 111 percent increase in consumption at the 10th percentile while only 25 percent increase at 90th percentile

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 - consumption reduced by 10.9 percent at the 10th percentile and only by 5.6 percent at 75th and 90th percentiles
- Changes in 'economic returns' had no effect at 10th and 25th percentiles but reduced consumption at higher percentiles

Results: Implications for Poverty and Inequality

Alert step lists

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- Economic returns accounted for 23.3 % of the Gini, 14.4 % of the Theil index and 22.3 of the Change in the MLD
- Changes in employment countered the reduction in inequality by the other factors.

Results Robustness Checks

- Checked sensitivity to change of order of decomposition results very similar.
- Results also robust to choice of equivalency scales.
- Index number problem recognized but not dealt with

The End

Thank you for your attention