Impact of Equalizing Human Capital Endowments on Inequality in Cameroon


by

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Plan

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Introduction

- Mass mobilization of citizens calling for more social and economic justice, political participation and openness led to the ousting of leaders in about four African countries in 2011.

- Aspirations for greater social cohesion, with fair chances for everybody in society is ingrained in the concepts of equity, fairness and social justice.

Introduction ....

- Early ideas of equity postulated that individuals should be rewarded according to their contribution to society (Homans, 1961; Blau, 1964; Adams, 1965)

- Used interchangeably with fairness, equity has come to refer primarily to distributive justice, which draws a distinction between just and unjust inequalities between people.
Inequality have been the basis of many social conflicts with deleterious effects on poverty, peace and social cohesion –
- threatening the sustainability of growth, poverty reduction, and peaceful co-existence in many LICs.

Such manifestations have been prompting a growing concern in both policy and academic circles to know more about inequality of outcomes.
Yet, it is important to draw a distinction between legitimate and illegitimate sources of inequalities.

Especially in a context where embezzlement and corruption and the inter-generational transmission of such ill-gotten wealth appears to be common place in many LICs.
Measured inequality or inequality of outcomes is a function of two components:

- comprising inequality of exogenous circumstances, to which an individual may not be held responsible; and
- inequality of endogenous effort, to which an individual can largely be held responsible.

Measured inequality is, therefore, influenced by factors outside and within the individual control.
Factors outside individual control have been labeled exogenous circumstances, and
Factors within individual control have been branded effort related variables (Roemer (1998); Bourguignon et al., 2007; Nunez and Tartakowsky, 2007)
Introduction ....

- **Circumstances** are attributes of the environment that are beyond the control of the individual that we loosely term exogenous factors - parental education and occupation; race; region of birth and variables captured at the community level.

- **Effort** is that set of choice or decision variables that are endogenous with other household decisions, which together with circumstances determines the desired level of well-being.
The novelty of this approach is, therefore, its partitioning of income differentials into two components:

- the first due to differential circumstances beyond the control of individuals; and
- the second due to individual variation in voluntary effort.

Well-being is a function of both effort and circumstances, and by the same token measured inequality is a function of effort and circumstance related variables.
Introduction ....

- We consider human capital endowments – education and health,
  - as the fundamental determinants of household economic well-being because they complement with or
  - substitute for exogenous circumstances that enhance or constrain household livelihood opportunities.
Research Questions

- In this context, two key questions arise:
  - What is the role of human capital endowments in the determination of household economic well-being?
  - What is the impact on measured inequality of equalizing human capital endowments?
Objectives

- To address these research issues, this paper attempts:
  - (1) To estimate an income generating function in which human capital endowments are considered as endogenous;
  - (2) To evaluate the impact on measured inequality of equalizing human capital endowments;
  - (3) To discuss policy implications on the basis of the findings.
Some issues ....

- This exercise requires the generation of factual and counterfactual distributions of HEW.

- Human capital endowments are thought to be largely effort-related,
  - so fixing them in the counterfactual distribution is tantamount to removing the legitimate sources of variation and allowing only the illegitimate (circumstance-based) sources of variation.
Some issues ..... 

- These factual and counterfactual experiments are based on a structural model estimated using the control function econometric approach, and the 2007 Cameroon household consumption survey.

- Comparing inequality generated from the counterfactual distribution with the inequality of outcomes would give rise to the inequality impacts under study.
Methodology ....

- Total spending per capita is proxy for our household economic well-being (HEW)
- **Structural Equation of interest** is expressing:
  - \( \text{HEW} = f(\text{Vector of exogenous circumstances}; \text{Vector of effort-related human capital endowments}; \text{Error term}) \)
  (1)
- Human capital endowments are education and health, which are composite indices constructed by the multiple correspondence analyses (MCA) approach
Methodology ....

- Since HEW and human capital endowments are likely to be jointly determined, we purged parameter estimates of potential endogeneity and unobserved heterogeneity.

- A conventional method to proceed is to use the instrumental variables (IV)-cum control function approach.
Methodology ....

- To do this, the **reduced form of human capital endowments** is expressed as:
  
  - Human capital endowments = f(Vector of included exogenous circumstances ; Vector of instrumental variables; Error term)

  \[(2)\]

- From the reduced form estimates, we predict residuals of human capital endowments, and generate the interaction of human capital endowments with their respective residuals.
Methodology ....

- The estimating equation is obtained by augmenting the structural equation (Equation 1) into a control function (Wooldridge, 2002; Mwabu, 2009; Baye, 2010).
  - HEW=f(Vector of exogenous circumstances; Vector of effort-related human capital endowments; Vector of Residuals of human capital endowments, Vector of interaction of human capital endowments with their residuals; Error term) (3)
Factual and Counterfactual Experiments

- **Factual distribution** of well-being is reproduced as the sum of the predicted estimated well-being function and its predicted error term.

- **Counterfactual human capital equalizing benchmark**

- In this experiment, households are allocated the mean value of the endogenous human capital endowments, while allowing both direct and indirect exogenous circumstance-related variables as observed.
Inequality measures (I)

- *Gini Index*
- *The Generalised Entropy class of Inequality indices*
- **Inequality Impact** = 
  \[
  \frac{[I(\text{factual}) - I(\text{counterfactual})]}{I(\text{factual})}
  \]
Empirical Results

- Econometric Results
- Inequality Impact of equalizing human capital endowments
Table 2: Well-being Generating Function: Dependent variable is HEW (Robust t-statistics in parentheses, except otherwise specified)

<table>
<thead>
<tr>
<th>Variables</th>
<th>OLS (1)</th>
<th>CFA (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
<td>Method of estimation</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>0.2063*** (12.52)</td>
<td>1.772*** (23.79)</td>
</tr>
<tr>
<td>Health</td>
<td>0.1798*** (14.73)</td>
<td>1.074*** (7.91)</td>
</tr>
<tr>
<td>Ownership of savings (cluster mean)</td>
<td>0.3003*** (13.74)</td>
<td>-0.4217*** (-11.52)</td>
</tr>
<tr>
<td>Age of household head in years</td>
<td>0.000854** (2.5)</td>
<td>0.00424*** (6.27)</td>
</tr>
<tr>
<td>Household Size</td>
<td>-0.06794*** (-21.15)</td>
<td>-0.06325*** (-20.23)</td>
</tr>
<tr>
<td>Household size squared</td>
<td>0.001516*** (14.94)</td>
<td>0.001444*** (14.0)</td>
</tr>
<tr>
<td>Gender (Male=1)</td>
<td>0.0977*** (8.42)</td>
<td>0.1779*** (9.09)</td>
</tr>
<tr>
<td>Fraction of household members employed</td>
<td>0.6975*** (20.48)</td>
<td>0.8099*** (24.34)</td>
</tr>
<tr>
<td>Urban residency (Urban=1)</td>
<td>0.2634*** (17.69)</td>
<td>0.06764*** (3.91)</td>
</tr>
<tr>
<td>Farmland ownership (Cluster mean)</td>
<td>-0.5687*** (-26.78)</td>
<td>0.2118*** (6.11)</td>
</tr>
<tr>
<td>Education residual</td>
<td>-1.844*** (-20.56)</td>
<td></td>
</tr>
<tr>
<td>Health residual</td>
<td>-1.058*** (-7.46)</td>
<td></td>
</tr>
<tr>
<td>Education times its residual</td>
<td>0.1938*** (4.53)</td>
<td></td>
</tr>
<tr>
<td>Health times its residual</td>
<td>0.1789*** (3.28)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>12.33*** (326.09)</td>
<td>9.639*** (93.11)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.5090</td>
<td>0.5419</td>
</tr>
<tr>
<td>F-Stat [df; p-val]</td>
<td>1179.57 [10, 11380]</td>
<td>961.33 [14, 11376; 0.000]</td>
</tr>
<tr>
<td>Group Variable</td>
<td>Gini Index</td>
<td>Inequality Impact:</td>
</tr>
<tr>
<td>------------------</td>
<td>------------</td>
<td>--------------------</td>
</tr>
<tr>
<td></td>
<td>Factual</td>
<td>Counterfactual</td>
</tr>
<tr>
<td>Sector of Employment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>0.3303</td>
<td>0.4292</td>
</tr>
<tr>
<td></td>
<td>(0.0065)</td>
<td>(0.0099)</td>
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<tr>
<td>Secondary</td>
<td>0.3711</td>
<td>0.4237</td>
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<tr>
<td></td>
<td>(0.0116)</td>
<td>(0.0115)</td>
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<tr>
<td>Tertiary</td>
<td>0.3795</td>
<td>0.4413</td>
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<tr>
<td></td>
<td>(0.0077)</td>
<td>(0.0082)</td>
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<tr>
<td>Undefined</td>
<td>0.3935</td>
<td>0.4486</td>
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<tr>
<td></td>
<td>(0.0121)</td>
<td>(0.0134)</td>
</tr>
<tr>
<td>Cameroon</td>
<td>0.4077</td>
<td>0.4357</td>
</tr>
<tr>
<td></td>
<td>(0.0057)</td>
<td>(0.0069)</td>
</tr>
</tbody>
</table>

Source: Computed by authors using the 2007 Cameroon Household Survey (CHCS III), especially regression results from Column 2 of Table 2 and descriptive statistics from Table 1 and DASP 2.1 in Stata 10.1. Note: (.) denote standard error and [.] denote relative contribution/impact. The counterfactual distribution is the well-being distribution in which the human capital endowments are equalized at the mean values. is absolute change in inequality.
Summary of Results ....

- Econometric results depicted human capital endowments as correlating positively and significantly with household economic well-being, while controlling for other correlates.

- Simulated results indicated that inequality increases from the primary to the tertiary sectors in both the factual and counterfactual distributions.
Irrespective of the inequality measure used, when human capital endowments are equalized, inequality in the counterfactual distribution increases significantly and overwhelmingly compared to observed or factual inequality.

The general observation is that human capital endowments (education and health) have inequality reducing effects, while exogenous circumstance-related variables register inequality augmenting effects.
Policy Implications....

- The implication of this observation is that measured inequality in Cameroon is generally caused by factors beyond the control of the individual household and hence mainly unjustified.
- This requires policy attention to provide a level playing field.
- Since education and health endowments are found to be inequality reducing, they appear as potential candidates for leveling the playing field for equal opportunities.
Moreover, due to deficiencies in the income tax systems in many LICs, development economists tend to favour relatively simple systems of resource reallocation based on public egalitarian spending on education, nutrition, and health in lieu of progressive taxation.
Policy Implications....

- The results registered in this paper, therefore, herald the uniqueness of human capital endowments in enhancing well-being and mitigating inequality.

- This is indication that educational and health interventions are key factors that drive well-being and attenuate inequality, and
  - therefore powerful candidates in promoting growth, equity and sustainability.
Thank you very much for your kind attention