

Comparing multi-dimensional and monetary poverty in Uganda

[preliminary results]

Sebastian Levine

UNDP Regional Bureau for Africa

Oxford Poverty & Human Development Initiative

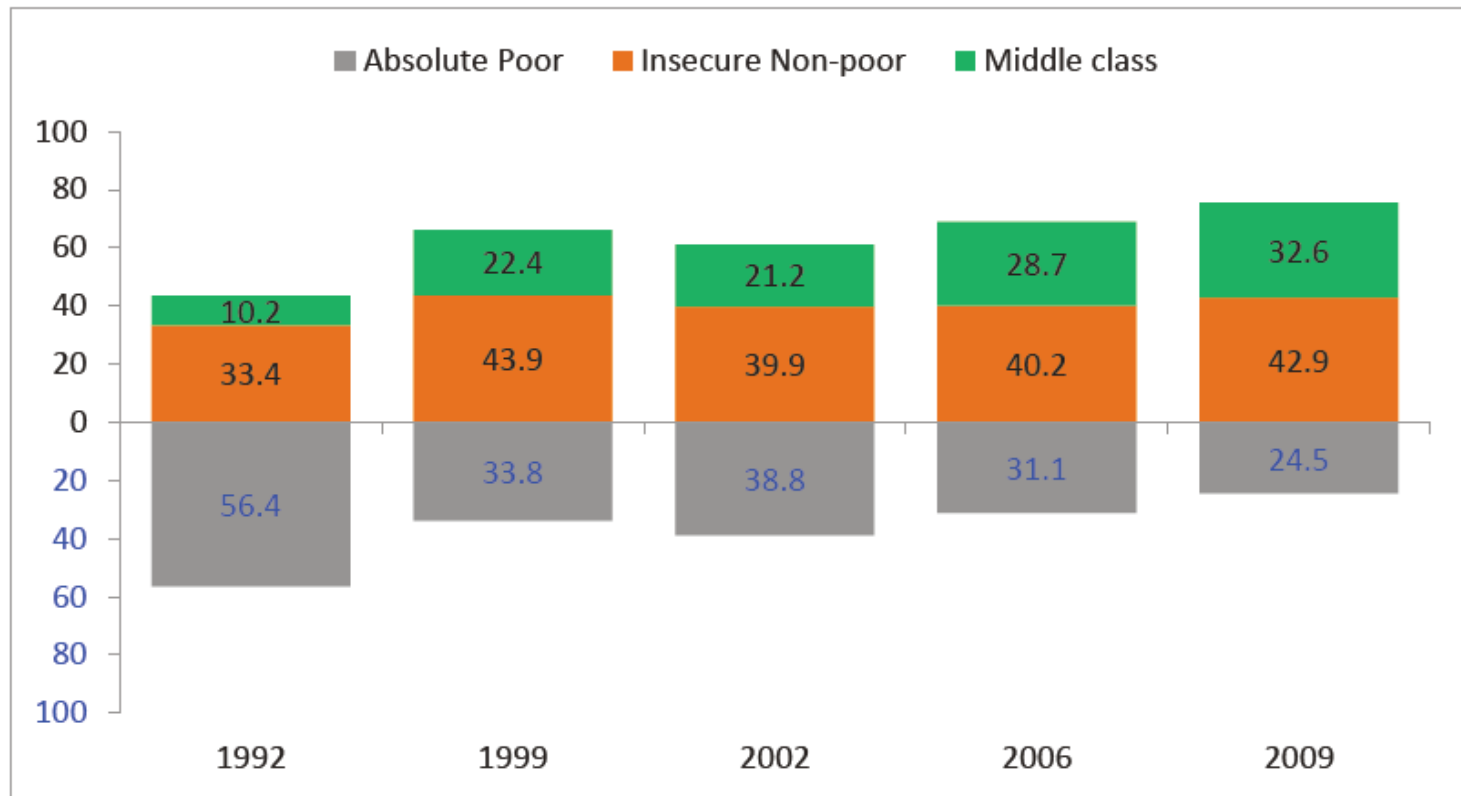
21-22 November 2012

Work on multi-dimensional poverty in Uganda is motivated by:

- * Fall in monetary poverty (from 56% in 1992/3 to 25% in 2009/10) but less progress on MDG>1 (insufficient progress on 10 of 17 targets)
- * APRM recommendation on MD poverty
- * Uganda not in Alkire & Santos (2010)
- * Interest at Uganda Bureau of Statistics, Ministry of Finance, researchers
- * Large discrepancies between measures especially in Uganda
- * Guide policy and policy-oriented research

Focus of poverty debate is shifting

The poor, insecure non poor and the middle class, 1992-2009



Source: Ministry of Finance of Uganda, 'Poverty Status Report 2012'

This study builds on previous work (OPHI WP 55) with Muwonge and Batana:

- * Computed MPI for Uganda in 2005/6 and 2001/2
- * Makes international comparison and MPI decomposition
- * Distinguishes formally between 'dimensions' and 'domains'
- * Conducts stochastic dominance analysis with household size in second dimension
- * Provides a first comparison of MPI with monetary poverty

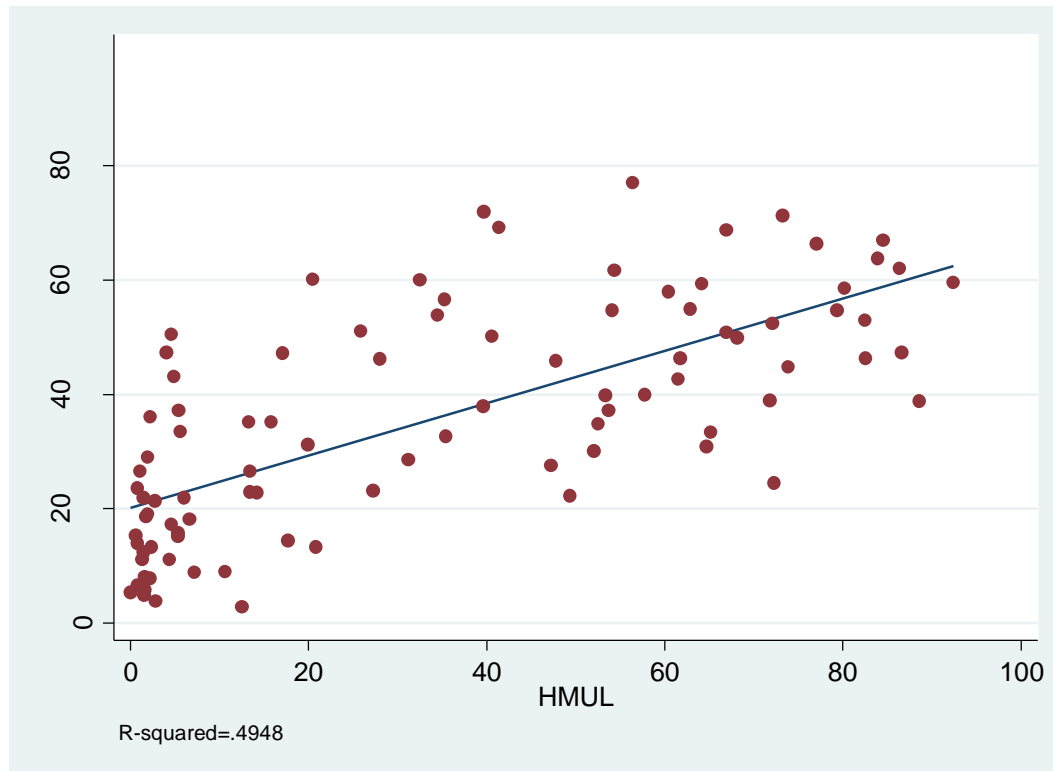
How do measures of multi-dimensional poverty compare with the traditional monetary measures in terms of the groups of people that are classified as poor and non-poor?

Overview of the presentation

- * Some issues in comparability
- * Data
- * Measures of multi-dimensional and monetary poverty
- * Empirical results
 - * Unconditional: Correlations, cross-tabulations, venn diagrams, density curves
 - * Conditional: Bivariate probit
- * Next steps

The global picture strong correlation but country specific variation

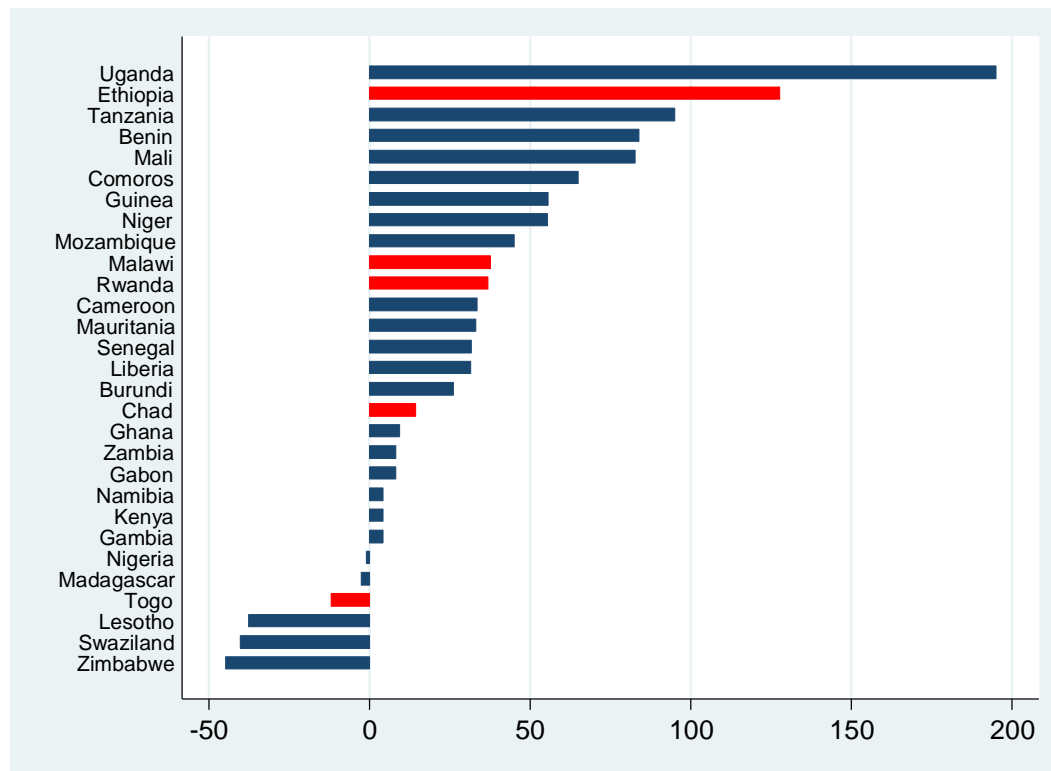
Estimates of multi-dimensional and monetary poverty for 93 countries (in %)



Source: Data is from Alkire, S., J.M. Roche, M.E. Santos and S. Seth (November 2011)
ophi.qeh.ox.ac.uk

Large differences at country-level and Uganda stands out

Differences in estimates of multi-dimensional and monetary poverty in 29 sub-Saharan African countries (in %)



Source: Data is from Alkire, S., J.M. Roche, M.E. Santos and S. Seth (November 2011)
ophi.queh.ox.ac.uk

Note: Red bars are for countries where data used to estimate monetary and multi-dimensional poverty were collected in the same year.

Definition of multi-dimensional poverty headcount (HMUL) used in the paper:

- * Using H from Alkire and Foster (2007)
- * Dimensions and cut-offs as per Alkire and Santos (2010)
- * Focus on $k = 3$ and $k = 4$ with robustness checks

The composition of HMUL:

Dimensions and cut-offs

Domain	Dimension, <i>j</i>	Cut-off:
1. Education	Years of schooling	No household member has completed five years of schooling
	School enrolment	Any school-aged child is not attending school in years 1 to 8
2. Health	Child mortality	Any child has died in the household in the last five years
	Nutrition	Any adult or child is malnourished
3. Standard of living	Electricity	Household has not electricity
	Sanitation	Household's sanitation facility is not improved or is shared
	Water	Household does not access to drinking water or when the time to access water exceed 30 minutes
	Floor	Household has dirt, sand or dung floor
	Cooking	Household cooks with dung, wood or charcoal
	Assets	Household does not own a car and more than one of radio, TV, telephone, bike or motorbike

Defining monetary poverty (HMON):

- * Uganda Poverty Line (UPL): 21,135 (1997 prices)
- * “Lower bound” poverty line (Ravallion 1994)
- * Using household consumption expenditure in adult equivalents
- * HMON is special case of HMUL with $k=j=1$ and $z=UPL$

Data is available to foster comparability:

- * Uganda National Household Survey 3; May 2005-Apr 2006 (N=7,426)
- * Demographic Health Survey; May-Oct 2006 (N=8,870)
- * Two stage sample selection (purposeful and random):
 - * 1. Clusters from UNHS sample + additional clusters (IDP, Karamoja)
 - * 2. Complete listing and selection of all UNHS households + additional households
- * Matching sub-sample (N=2,177)

In direct comparison of poverty headcounts HMUL is much greater than HMON...

Cross tabulations of headcounts of multi-dimensional and (unadjusted) monetary poverty

	HMUL		HMON
	<i>k</i> =3	<i>k</i> =4	
Uganda	0.673	0.475	0.280
Gender			
Male	0.660	0.474	0.273
Female	0.719	0.479	0.306
Zone			
Urban	0.299	0.131	0.057
Rural	0.754	0.549	0.328
Region			
Eastern	0.757	0.557	0.398
Central	0.466	0.269	0.139
Northern	0.801	0.654	0.560
Western	0.806	0.587	0.252

...therefore UPL is adjusted so that HMON=HMUL

Overlap and differences in headcounts of multidimensional and equalised monetary poverty

	k=3				k=4			
	(1) Both	(2) HMUL only	(3) HMON only	(4) Neither	(1) Both	(2) HMUL only	(3) HMON only	(4) Neither
Uganda	0.525	0.148	0.148	0.179	0.295	0.180	0.180	0.345
Gender								
Female	0.520	0.199	0.113	0.168	0.320	0.159	0.149	0.373
(0.218)	(0.216)	(0.292)	(0.166)	(0.204)	(0.236)	(0.192)	(0.180)	(0.235)
Male	0.526	0.134	0.158	0.182	0.288	0.186	0.189	0.337
(0.782)	(0.784)	(0.708)	(0.834)	(0.796)	(0.764)	(0.808)	(0.820)	(0.765)
Zone								
Rural	0.607	0.147	0.158	0.089	0.345	0.204	0.205	0.246
(0.822)	(0.951)	(0.815)	(0.873)	(0.408)	(0.962)	(0.932)	(0.936)	(0.586)
Urban	0.145	0.154	0.106	0.596	0.062	0.069	0.064	0.804
(0.178)	(0.049)	(0.185)	(0.127)	(0.592)	(0.038)	(0.068)	(0.064)	(0.414)
Region								
Central	0.294	0.172	0.180	0.355	0.139	0.131	0.156	0.575
(0.360)	(0.202)	(0.419)	(0.436)	(0.714)	(0.170)	(0.261)	(0.312)	(0.600)
Eastern	0.683	0.074	0.175	0.067	0.407	0.151	0.243	0.200
(0.206)	(0.269)	(0.104)	(0.244)	(0.078)	(0.285)	(0.173)	(0.279)	(0.119)
Northern	0.756	0.045	0.137	0.062	0.555	0.099	0.206	0.139
(0.126)	(0.180)	(0.038)	(0.115)	(0.044)	(0.236)	(0.069)	(0.144)	(0.050)
Western	0.595	0.211	0.099	0.096	0.296	0.292	0.155	0.258
(0.308)	(0.349)	(0.440)	(0.205)	(0.165)	(0.309)	(0.498)	(0.265)	(0.230)

Note: Column percentages in brackets. * = Monetary poverty line is adjusted to equalise headcounts (Uganda Shilling 36,800 for k = 3 and 28,077 for k = 4, both in 1997 prices).

Correlations between poverty status and monetary welfare...

Overlap and differences by consumption expenditure decile

	k=3				k=4			
<u>Decile</u>	(1) Both	(2) HMUL only	(3) HMON only	(4) Neither	(1) Both	(2) HMUL only	(3) HMON only	(4) Neither
1	0.875	0.000	0.125	0.000	0.686	0.000	0.314	0.000
2	0.736	0.000	0.264	0.000	0.572	0.000	0.428	0.000
3	0.703	0.038	0.248	0.011	0.039	0.485	0.043	0.433
4	0.000	0.595	0.000	0.405	0.000	0.360	0.000	0.640
5	0.000	0.338	0.000	0.662	0.000	0.155	0.000	0.845

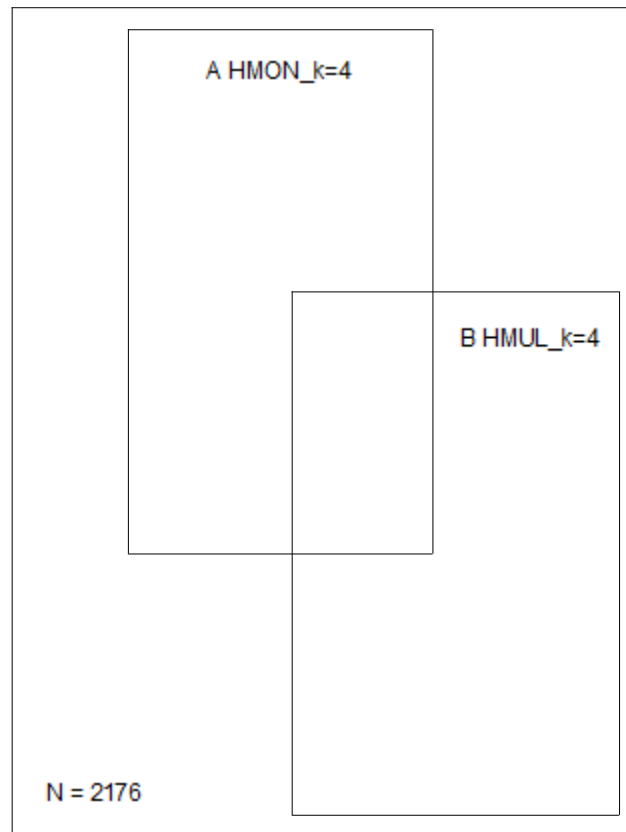
...and household size

Overlap and differences by household size

Household size	k=3				k=4			
	(1) Both	(2) HMUL only	(3) HMON only	(4) Neither	(1) Both	(2) HMUL only	(3) HMON only	(4) Neither
1	0.232	0.325	0.017	0.427	0.117	0.259	0.035	0.590
2	0.314	0.268	0.059	0.359	0.163	0.225	0.084	0.528
3	0.398	0.231	0.115	0.256	0.195	0.215	0.144	0.446
4	0.458	0.193	0.100	0.249	0.231	0.207	0.122	0.440
5	0.435	0.233	0.127	0.205	0.225	0.210	0.189	0.376
6	0.483	0.202	0.140	0.176	0.243	0.249	0.167	0.341
7	0.548	0.162	0.117	0.172	0.362	0.186	0.137	0.315
8	0.551	0.144	0.109	0.196	0.366	0.166	0.148	0.320
9	0.642	0.123	0.115	0.119	0.355	0.195	0.192	0.258
10	0.496	0.132	0.249	0.123	0.286	0.233	0.212	0.270

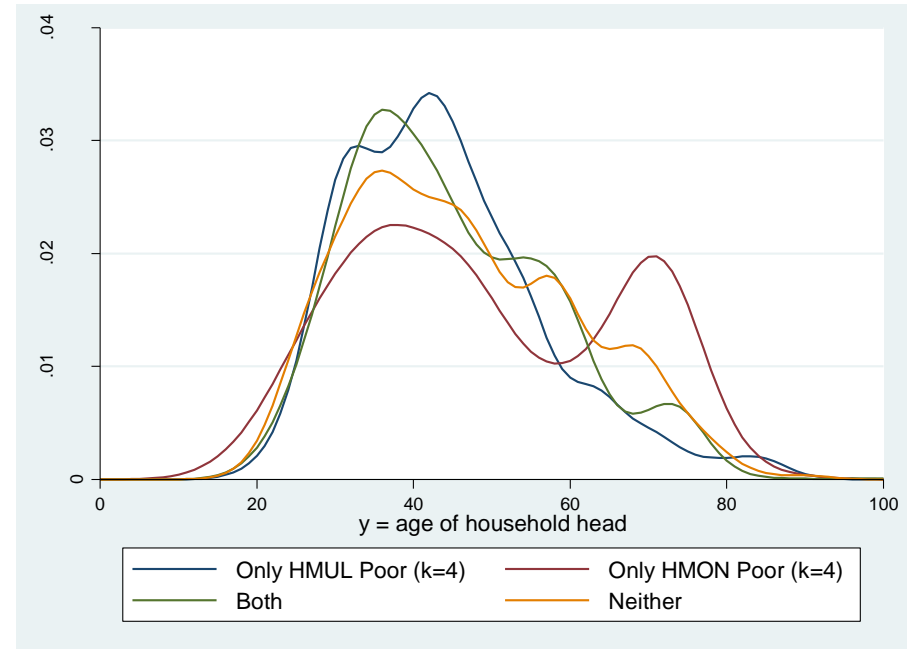
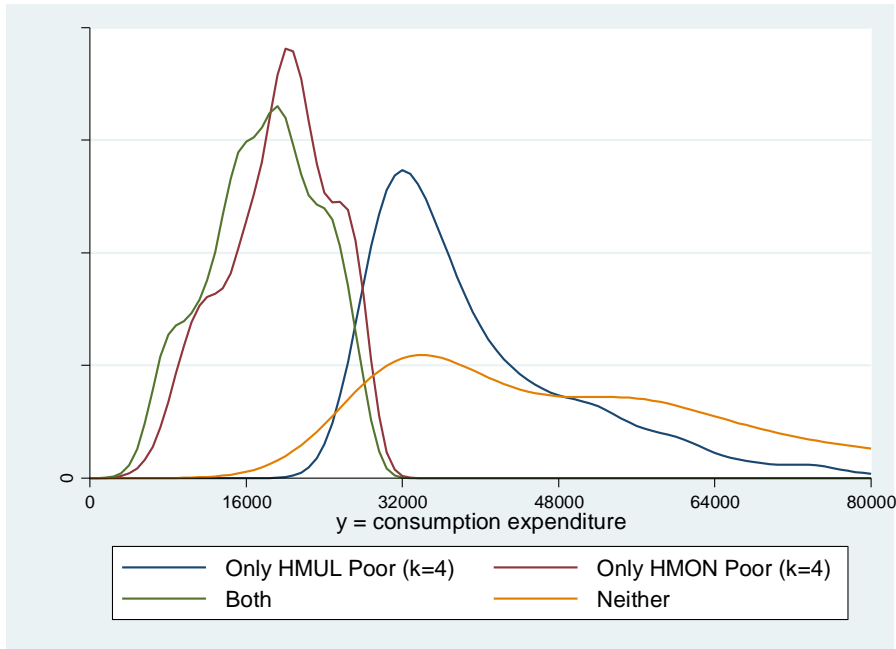
Visualising poverty headcount combinations -venndiag-

Venn diagram



...more visualisations

Density curves (k = 4)



Bivariate probit is used to analyse poverty outcomes

- * Usual advantages of multi-variate analysis
- * Two probit regressions when error terms are correlated
- * Enables analysis of all possible poverty outcomes (1/1; 0/0; 1/0; 0/1)
- * Selection of co-variates and pre-regression tests

Results from -biprobit-

Marginal effects with k=4

Number of obs = 2176 Log pseudolikelihood = -2369.7701 Rho = .1713797 Wald test of rho=0: chi2(1) = 18.5555 Prob > chi2 = 0.0000 Murphy's score test chi2(9) = 8.82 Prob > chi2 = 0.4543				
	Pr(HMUL=1, HMON=1)	Pr(HMUL=1, HMON=0)	Pr(HMUL=0, HMON=1)	Pr(HMUL=0, HMON=0)
Gender of household head (ref=Female) Male	0.03 (0.024)	0.01 (0.028)	0.01 (0.023)	-0.05 (0.033)*
Age of household	0.00 (0.001)	0.00 (0.001)***	0.00 (0.001)**	0.00 (0.001)
Household size squared	0.00 (0.000)	0.00 (0.000)	0.00 (0.000)	0.00 (0.001)
Number of children aged 0-9 years in the household	0.04 (0.008)***	0.01 (0.008)	0.01 (0.006)	-0.05 (0.010)***
Number of youth aged 10-17 in the household	0.00 (0.008)	-0.03 (0.008)***	0.02 (0.007)***	0.01 (0.011)
Number of female adults aged 18-59 years in the household	-0.02 (0.014)	-0.02 (0.013)	0.01 (0.011)	0.03 (0.018)
Number of male adults aged 18- 59 years in the household	-0.03 (0.012)***	-0.02 (0.014)	0.00 (0.011)	0.04 (0.016)***
Number of elderly over 60 years in the household	-0.07 (0.022)***	-0.13 (0.027)***	0.09 (0.022)***	0.12 (0.030)***

...continued

	Pr(HMULi=1, HMONi=1)	Pr(HMULi=1, HMONi=0)	Pr(HMULi=0, HMONi=1)	Pr(HMULi=0, HMONi=0)
Zone of residence (ref=Rural)				
Urban	-0.18 (0.015)***	-0.08 (0.024)***	-0.06 (0.021)***	0.32 (0.034)***
Region of residence (ref=Northern)				
Central	-0.23 (0.019)***	0.00 (0.026)	-0.10 (0.018)***	0.34 (0.031)***
Eastern	-0.12 (0.019)***	-0.02 (0.027)	-0.04 (0.021)**	0.18 (0.034)***
Western	-0.19 (0.017)***	0.07 (0.028)***	-0.14 (0.017)***	0.25 (0.031)***
Main source of income for the household (ref=Wages and salaries)				
Subsistence agriculture	0.04 (0.022)*	-0.01 (0.026)	0.02 (0.021)	-0.05 (0.029)*
Non-agricultural business	-0.07 (0.022)***	-0.01 (0.029)	-0.02 (0.024)	0.10 (0.036)***
Other income	-0.04 (0.029)	0.02 (0.041)	-0.03 (0.029)	0.05 (0.044)
Civil status of head of household				
Married (monogamous)	0.04 (0.043)	0.04 (0.050)	-0.02 (0.041)	-0.05 (0.059)
Married (polygamous)	-0.01 (0.046)	0.09 (0.060)	-0.07 (0.038)*	-0.01 (0.063)
Divorced/separated	0.05 (0.057)	0.03 (0.062)	-0.02 (0.046)	-0.07 (0.063)
Widow/widower	0.06 (0.058)	0.07 (0.065)	-0.04 (0.043)	-0.09 (0.064)
Education of the household head (ref=no formal)				
Some primary	-0.08 (0.021)***	-0.08 (0.023)***	0.04 (0.020)*	0.12 (0.029)***
Complete primary	-0.17 (0.016)***	-0.17 (0.022)***	0.04 (0.029)	0.29 (0.035)***
Some secondary	-0.20 (0.013)***	-0.16 (0.023)***	-0.04 (0.025)*	0.41 (0.035)***
Complete secondary	-0.20 (0.012)***	-0.15 (0.030)***	-0.10 (0.026)***	0.45 (0.040)***
Post-secondary	-0.22 (0.011)***	-0.18 (0.027)***	-0.14 (0.022)***	0.54 (0.036)***

Note: Robust standard errors in brackets. Marginal effects (dy/dx) are for discrete changes of the dummy variables from 0 to 1. Levels of significance is given at 1% = ***, 5% = ** and 10% = *.

Preliminary conclusions

- * HMUL much larger than HMON also when correcting for survey comparability; is UPL too low?
- * 53% (30%) are poor on both measures at $k=3$ ($k=4$); 17% (34%) are non-poor in both.
- * Limited discernible gender effects throughout...at hh level
- * HMUL disproportionately affects rural areas, Northern and Western regions
- * 34% (16%) of wealthiest consumption quintile are also multi-dimensionally poor at $k=3$ ($k=4$)
- * Apparent life-cycle effects: “misclassification” of youth and elderly
- * Strength of integrated household survey programmes