On the Dynamics of Multidimensional Chronic Poverty

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UNU/Wider: Inequality, measurement, trends, impacts and policies

Motivation

- Distinguishing between chronic and transient poverty is important for policy matters.
- The chronically poor are most likely to remain in poverty in the absence of effective assistance, and persisting conditions of poverty have a long lasting effect.
- “The chronic poor are likely to be neglected in such an era given the multiple factors that constrain their prospects” (Hulme, 2003).

Literature

Measures of poverty and time

- Intertemporal poverty: measures that are sensible to the poverty experience (Bossert et al, 2012; Hoy and Zheng, 2011; Duclos et al, 2010)

- Chronic poverty :

  - Permanent income approach (Jalan and Ravallion, 1998; Foster and Santos, 2012).

  - Spells approach (Levy, 1977; Foster, 2009)

Literature (cont.)

Poverty/Inequality decompositions

- Economic growth and poverty / inequality: Ravallion and Huppi (1991), Datt and Ravallion (1992).

- Determinants of poverty measures are useful, and the Shapley method as suggested by Shorrocks (2013) present the advantages of being path-independent and exact additive.

Multidimensional Chronic Poverty

We build on Alkire et al., (2013) to apply Shapley (1953)

$$H_C(x;z,k,\tau)=\frac{1}{n}\sum_{i=1}^{n}\rho_i(k;\tau)=\frac{q}{n}$$

$$M_C^{\alpha}(x;\omega,z,k,\tau)=\frac{1}{ndT}\sum_{i=1}^{n}\rho_i(k;\tau)\sum_{t=1}^{T}\sum_{j=1}^{d}\omega_j g_{ij}^{t}(\alpha)=H_C A_C$$

$$where\ A_C=\frac{1}{qdT}\sum_{i=1}^{n}\rho_i(k;\tau)\sum_{t=1}^{T}\sum_{j=1}^{d}\omega_j g_{ij}^{t}(\alpha)$$

$$g_{ij}^{t}(\alpha)=\left(1-\frac{x_{ij}}{z_j}\right)^{\alpha}$$

A_C represents the average deprivation share among the chronic poor

Shapley

Making use of the sub-group decomposability characteristic.

If θ_l^t and M_{Cl}^t represent the population share and chronic poverty level of subgroup $l \in \mathrm{m}$, at time τ (τ=1,2)

$$\Delta M_C = \sum_{l=1}^{m} \left(\theta_l^2 M_{Cl}^2 - \theta_l^1 M_{Cl}^1 \right)$$

Applying the Shapley decomposition proposed by Shorrocks (1999)

$$\Delta M_C = \sum_{l=1}^{m} \left(\frac{\theta_l^2 + \theta_l^1}{2} \right) \left(M_{Cl}^2 - M_{Cl}^1 \right) + \sum_{l=1}^{m} \left(\frac{M_{Cl}^2 + M_{Cl}^1}{2} \right) \left(\theta_l^2 - \theta_l^1 \right)$$

Knowing that $M_C = H_C A_C$, if we apply the Shapley decomposition again

$$\Delta M_C = \frac{A_{Cl}^2 + A_{Cl}^1}{2}\left(H_{Cl}^2 - H_{Cl}^1\right) + \frac{H_{Cl}^2 + H_{Cl}^1}{2}\left(A_{Cl}^2 - A_{Cl}^1\right)$$

If we apply this equality to the previous equation

$$\Delta M_C = \underbrace{\sum_{l=1}^{m}\left(\frac{M_{Cl}^2 + M_{Cl}^1}{2}\right)\left(\theta_l^2 - \theta_l^1\right)}_{\text{Demographic effect}} + \underbrace{\sum_{l=1}^{m}\left(\frac{\theta_l^2 + \theta_l^1}{2}\right)\frac{A_{Cl}^2 + A_{Cl}^1}{2}\left(H_{Cl}^2 - H_{Cl}^1\right)}_{\text{Within: incidence}}$$

$$\underbrace{\sum_{l=1}^{m}\left(\frac{\theta_l^2 + \theta_l^1}{2}\right)\frac{H_{Cl}^2 + H_{Cl}^1}{2}\underbrace{\sum_{j}^{d}\frac{\omega_j}{d}\left(\frac{CH_{jCl}^2}{H_l^2} - \frac{CH_{jCl}^1}{H_l^1}\right)}_{\text{Intensity: indicator}}}_{\text{Within: intensity}}$$

Empirical Illustration

Data from the Permanent Household Survey (EPH) from Argentina, for the period 2004-2012. It uses the sampling format 2-2-2

% Share	HH1	HH2	HH3	HH4	Total
2004					
Population	6.13%	51.03%	16.27%	26.57%	100.00%
Mult. Headcount ratio (H)	4.18%	65.46%	19.11%	11.24%	99.99%
2012					
Population	6.91%	47.93%	16.92%	28.24%	100.00%
Mult. Headcount ratio (H)	2.42%	47.95%	39.61%	10.02%	100.00%

HH1: (+) children (+) older adults
HH2: (+) children (-) older adults
HH3: (-) children (+) older adults
HH4: (-) children (-) older adults

Results

Table 1

Dimension	Variable	% in deprivation 2004	% in deprivation 2012	Δ depriv.
Education	Educational Achievement	8.55%	8.87%	0.32%
	School Attendance	7.81%	6.56%	-1.25%
	Illiteracy	4.23%	2.79%	-1.44%
Housing	Overcrowding	31.35%	27.15%	-4.19%
	Shelter	12.66%	9.33%	-3.34%
	Toilet	10.06%	5.55%	-4.50%
Income/Employment	Income	45.81%	4.97%	-40.84%
	Unemployment	10.97%	12.48%	1.52%
	Quality of employment	43.29%	37.82%	-5.47%
	N	32772	38812	

Source: own calculations using the EPH.

Results (cont.)

Table2: Headcount ratio by poverty cutoff (t=4)

	Pov. cut-off, k=1		Pov. cut-off, k=2		Pov. cut-off, k=3		Pov. cut-off, k=4	
	2004	2012	2004	2012	2004	2012	2004	2012
H	63.73%	51.79%	36.70%	22.72%	19.54%	8.53%	8.26%	1.67%
A	7.04%	5.54%	9.13%	7.80%	11.08%	9.88%	13.23%	13.28%
M	4.49%	2.87%	3.35%	1.77%	2.17%	0.84%	1.09%	0.22%

Source: own calculations using the EPH

One of the AF methodology is that it allows flexibility in the cut-off set up.

	HH1	HH2	HH3	HH4	Total
Multidimensional Chronic Poverty					
Headcount (H) – 2004	13.35%	25.07%	22.96%	8.27%	19.54%
Intensity (A) – 2004	11.38%	11.39%	9.81%	11.33%	11.08%
Multidimensional Chronic Poverty (M)	1.52%	2.85%	2.25%	0.94%	2.17%
Headcount (H) – 2012	2.99%	8.54%	19.98%	3.03%	8.53%
Intensity (A) – 2012	9.93%	10.48%	8.98%	10.59%	9.88%
Multidimensional Chronic Poverty (M)	0.30%	0.89%	1.79%	0.32%	0.84%
Decomposition					
Total % contribution (ΔM_c)	5.49%	77.77%	4.75%	11.98%	100.00%
- Demographic effect	-0.53%	4.39%	-1.00%	-0.79%	2.07%
- Within group effect	6.03%	73.38%	5.75%	12.77%	97.93%
- Incidence (H)	5.44%	67.67%	3.52%	11.91%	88.54%
- Intensity (A)	0.58%	5.71%	2.24%	0.86%	9.40%
- Educational Achievement	0.00%	0.00%	-1.05%	-0.02%	-1.07%
- School Attendance	0.24%	-0.47%	0.05%	-0.02%	-0.20%
- Illiteracy	-0.11%	0.57%	0.32%	-0.36%	0.42%
- Overcrowding	-0.02%	0.62%	0.86%	-0.17%	1.29%
- Shelter	0.03%	-2.96%	0.28%	0.06%	-2.60%
- Toilet	-0.22%	-0.99%	0.28%	-0.12%	-1.04%
- Income	0.89%	11.96%	3.06%	2.33%	18.23%
- Unemployment	-0.22%	-2.42%	-1.26%	-0.73%	-4.63%
- Quality of employment	-0.01%	-0.59%	-0.31%	-0.10%	-1.01%

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- Through time, there are identifiable patterns in regard to hh groups, but not by indicator.

- HH2 lead the change in mult. chronic poverty, and HH3 was the least influential, coincidentally it was also the most vulnerable.

Figure 4: Relative importance of HH in □ $M_C(k=3,□=4)$

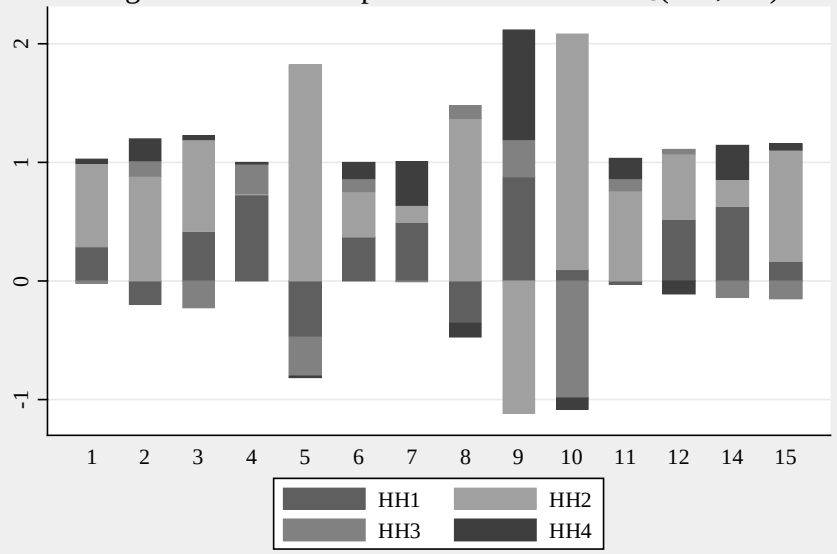
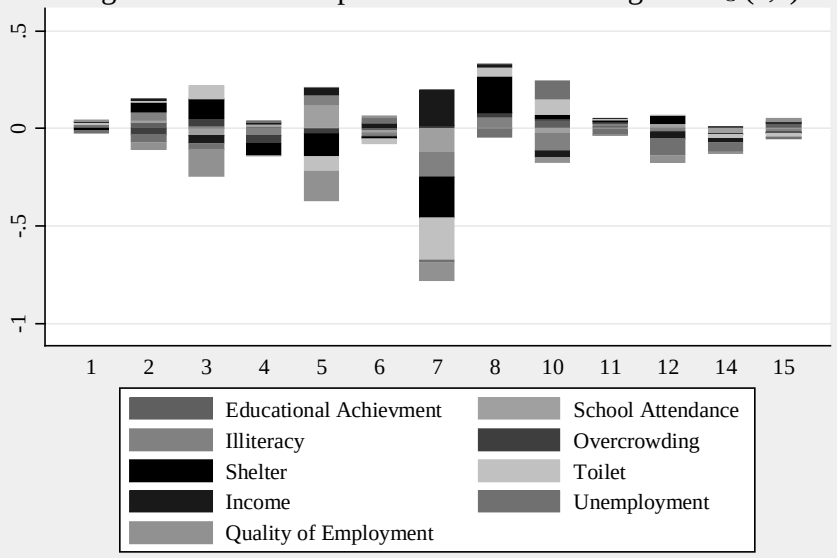


Figure 5: Relative importance of HH in change of M_C (k,□)



Conclusions

- Chronic multidimensional poverty decreased from 2.7% in 2004 to 0.84% in 2012.
- The vast majority of this change was due a change in the incidence of poverty rather than on the intensity of poverty.
- HH with children but without older adults drove the change in poverty.
- HH with older adults were the least influential in the change of poverty, and they were also the most vulnerable.
- For focalization purposes, the sub group analysis was more informative than the analysis by indicator.