



POVERTY PROFILES

Serbia National Poverty Analysis Workshop
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PLAN OF THE LECTURE

- 1) The Many Facets of a Poverty Profile
- 2) Robustness Analysis
- 3) Poverty Comparisons



POVERTY PROFILE

a definition

- ▶ A **poverty profile** shows how a measure of poverty varies across subgroups of a population (e.g. region of residence) and compares key characteristics of the poor versus non-poor.
- ▶ Main purposes:
 1. **to identify** poverty patterns
 2. **to formulate** poverty reduction strategies
 3. **to monitor** poverty changes



POVERTY PROFILE

questions addressed

- ▶ Poverty profiles help answer questions such as:
 1. **how many** are the poor?
 2. **who** are the poor?
 3. **where** do they live?
 4. what **economic sectors** they depend on?
 5. do they have access to **social services**?
 6. ...
- ▶ Poverty profiles are highly **sensitive** to the choice of the method for setting poverty lines and poverty measures...



POVERTY PROFILES

methods matter

Table 2. *Alternative Poverty Measures for Indonesia, 1990*

<i>Poverty measure</i>	<i>Area</i>	<i>CBN method</i>		<i>FEI method</i>
		<i>Food only</i>	<i>Food plus nonfood</i>	
Head-count index (percent)	Indonesia	7.93	19.63	15.08
	Urban	2.80	10.67	16.75
	Rural	10.20	23.58	14.33
Poverty gap index (percent)	Indonesia	0.97	3.46	2.42
	Urban	0.31	1.67	3.23
	Rural	1.26	4.25	2.06
Foster-Greer-Thorbecke P_2 index (x100)	Indonesia	0.18	0.87	0.66
	Urban	0.06	0.40	0.94
	Rural	0.24	1.08	0.53

Source: For estimates based on the CBN method, authors' calculations from BPS price data and 1990 SUSENAS data tapes; for estimates based on the FEI method, BPS (1992).



POVERTY PROFILE

the cover

Report No. 37992

Croatia: Living Standards Assessment

Volume 1: Promoting Social Inclusion and Regional Equity

November 2006

Poverty Reduction and Economic Management Unit
Europe and Central Asia Region

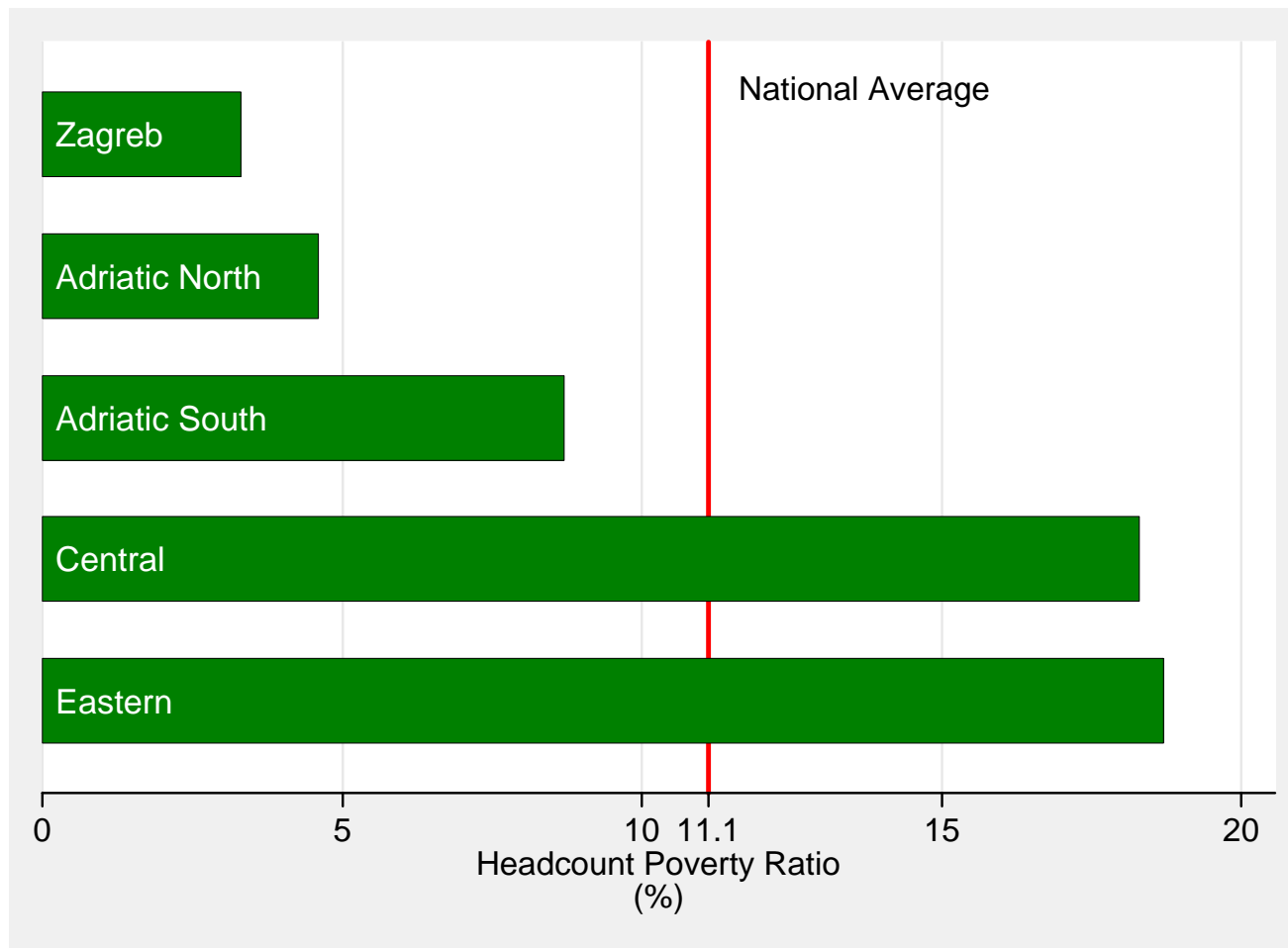




POVERTY PROFILE

facet 1: graphs (poverty rates by pop. subgroup)

Figure 6 – Poverty Incidence in Croatia by Region

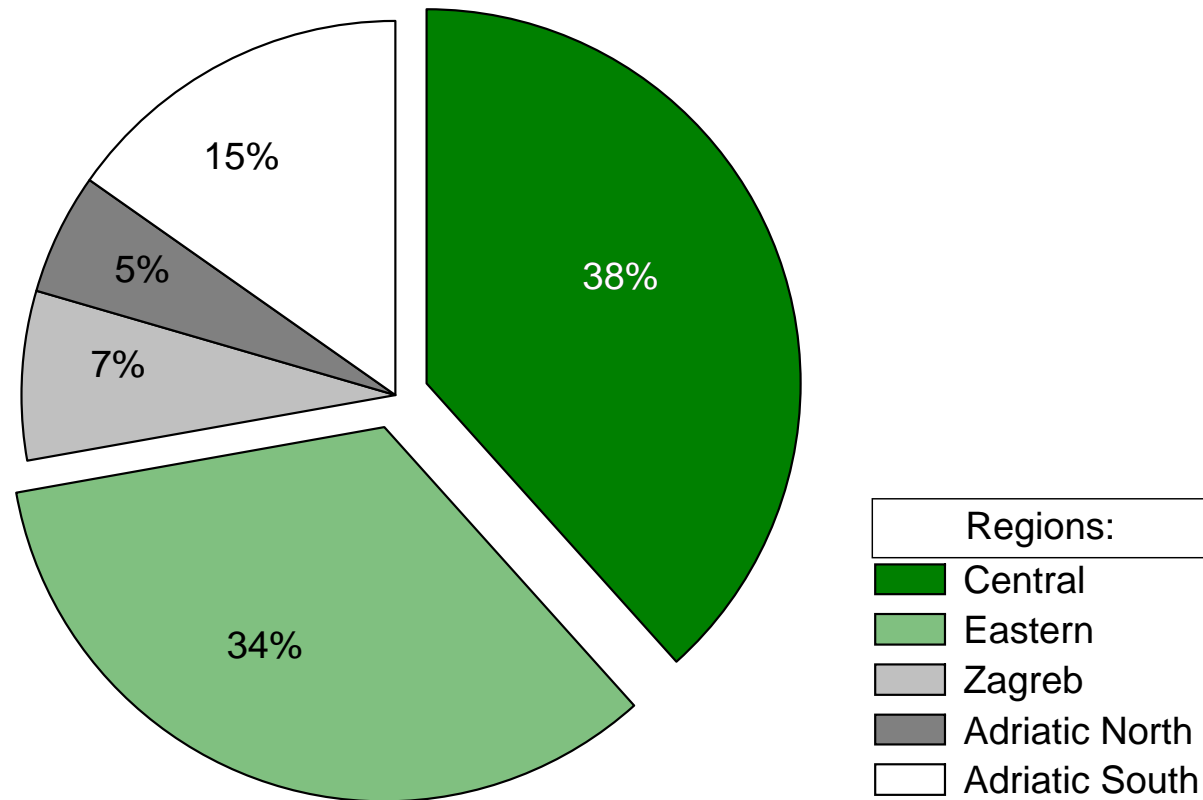




POVERTY PROFILE

facet 2: graphs (pop. shares accounted for)

Figure 7 – Distribution of Poverty by Region

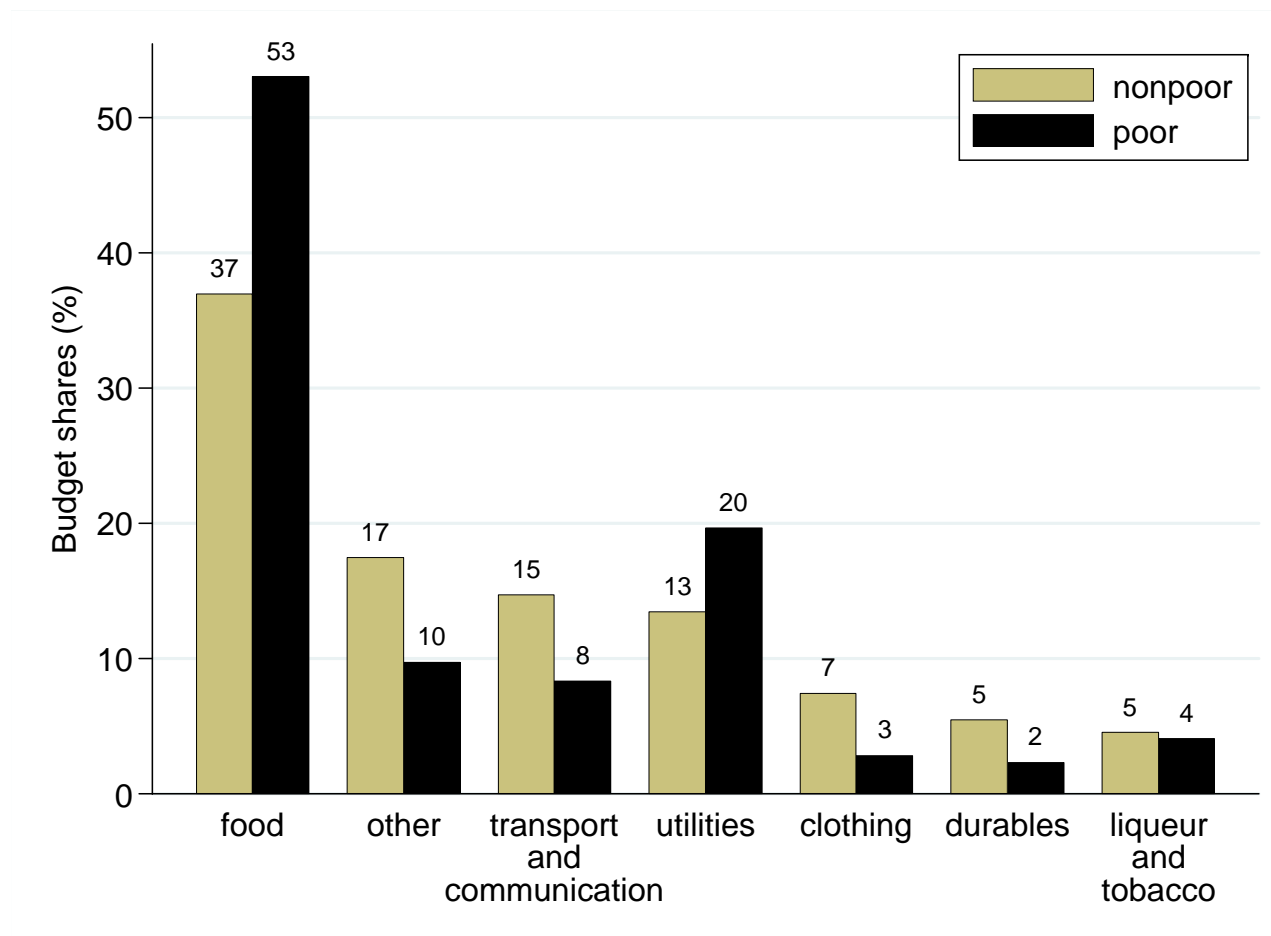




POVERTY PROFILE

facet 3: poor *versus* non-poor persons

Figure 7 – Expenditure Patterns of the Poor and the Nonpoor





POVERTY PROFILE

facet 4: tables

⊕ **Table 1: Poverty Incidence in Montenegro**

	2005	2006
National absolute poverty line in €/month/equivalent adult	144.68	
Poverty Rate (%)	11.3	11.3
<i>95% Confidence Interval</i>	<i>[8.5, 14.1]</i>	<i>[8.8, 13.8]</i>
Poverty Gap (%)	2.1	1.9
Poverty Severity (%)	0.7	0.6
Poverty line as a % of average consumption	52.6	53.6
Average consumption of the poor as a % of average consumption	42.8	44.4
Average deficit (%)	18.7	17.2
Estimated population	622,851	625,142
Estimated number of the poor	70,495	70,686

Note: Poverty line is expressed in monthly terms in 2006 prices. Source: Team estimates using the 2005 and 2006 HBS. □

Source: Nestic (2008), *Welfare Analysis in Montenegro using the Household Budget Survey Series*, mimeo.



POVERTY PROFILE

facet 5: words

- In 2006, **8.8%** of the population of Serbia was classified as poor.
- Central Serbia accounts for **63%** of national poverty incidence: Vojvodina **26.5%**, Belgrade **10.5%**.
- Poor hh tend to have larger-than-average size, high child-adult ratios, illiterate breadwinners.
- And so forth.

Source: Republic Statistical Office (2008), *Poverty in Serbia fir the year 2006. Preliminary results*, mimeo.



POVERTY PROFILE

facet 6: poverty risks

Subgroup FGT index estimates, FGT(a)

	a=0	a=1	a=2
urban			
rural	0.66667	0.37500	0.23958
urban	0.50000	0.25000	0.13000

poverty risk ...

Subgroup poverty 'share', $s_k = v_k \cdot \text{FGT}_k(a) / \text{FGT}(a)$

	a=0	a=1	a=2
urban			
rural	0.66667	0.69231	0.73436
urban	0.33333	0.30769	0.26564

Subgroup poverty 'risk' = $\text{FGT}_k(a) / \text{FGT}(a) = s_k / v_k$

	a=0	a=1	a=2
urban			
rural	1.11111	1.15385	1.22393
urban	0.83333	0.76923	0.66411



POVERTY PROFILE

facet 7: special reports



- After identifying the poor, in-depth analysis can focus on specific population groups



POVERTY PROFILE

facet 8: regression analysis

- From **simple** correlations (two-way tables and graphs) to **partial** correlations.
- Estimate (= regress) an econometric model for household expenditure and use it to predict poverty measures.
- Steps:
 1. Estimate regression: $\text{Log}(C_h) = \beta X_h + \varepsilon_h$
 2. Predict consumption: $E(C_h | X_h) = \text{Exp}(\beta X_h + \sigma^2/2)$
 3. Calculate poverty rates based on predicted consumption, or calculate probability of being poor.
- Simulations



ROOM FOR DISAGREEMENT

- The process of measuring poverty requires a number of **assumptions** and **decisions** to be made (on the welfare aggregate, on poverty lines, and on poverty indices).
- Those sceptical as to the conclusion that poverty has increased, for instance, may argue that the choice of a different **poverty line** could lead to a reversal of the conclusion.
- Two solutions:
 - 1) **sensitivity analysis**
 - 2) **stochastic dominance**



SENSITIVITY ANALYSIS

bosnia and herzegovina, 2003 (vol. II)

Report No. 25343-BIH

Bosnia and Herzegovina Poverty Assessment

(In Two Volumes) Volume II: Data on Poverty

November 21, 2003

Poverty Reduction and Economic Management Unit
Europe and Central Asia Region





SENSITIVITY ANALYSIS

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SENSITIVITY ANALYSIS

conclusions

Table 6.2 Key characteristics of poverty and its robustness to measurement assumptions.

Characteristics of poverty	Baseline, consumption per capita	OECD I scale	OECD II scale	Higher poverty line	Lower poverty line	Expenditure per capita
Mixed (semi-urban) municipalities in RS	yes	yes	yes	yes	yes	yes
Rural municipalities in FBiH	yes	yes	no	no	yes	no
IDPs and Refugees	yes	yes	yes	yes	yes	yes
Households headed by persons with low education (primary or less)	yes	yes	yes	yes	yes	yes
Households headed by persons with education above secondary	no	no	no	no	no	no
Unemployed (ILO) and inactive adults	yes	yes	yes	yes	yes	yes
Employed according to registration	no	no	no	no	no	no
Registered unemployed	yes	yes	yes	yes	yes	yes
Household headed by elderly	no	no	no	no	no	no
Larger households	yes	yes	no	yes	yes	yes

Source: Staff estimates based on BiH-LSMS 2001.



ATKINSON (1987)

On the Measurement of Poverty

A. B. Atkinson

Econometrica, Volume 55, Issue 4 (Jul., 1987), 749-764.

Stable URL:

<http://links.jstor.org/sici?sici=0012-9682%28198707%2955%3A4%3C749%3AOTMOP%3E2.0.CO%3B2-N>

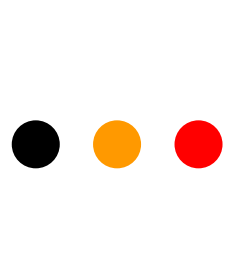




ATKINSON (1987)

stochastic dominance

- Atkinson (1987) explored the use of **stochastic dominance**.
- **Dominance methods** test whether one income distribution has more poverty than another for a broad class of **poverty measures** and a wide range of **poverty lines**.
- Take two income distributions **A** and **B**, characterized by cdfs **F_A** and **F_B**, respectively...

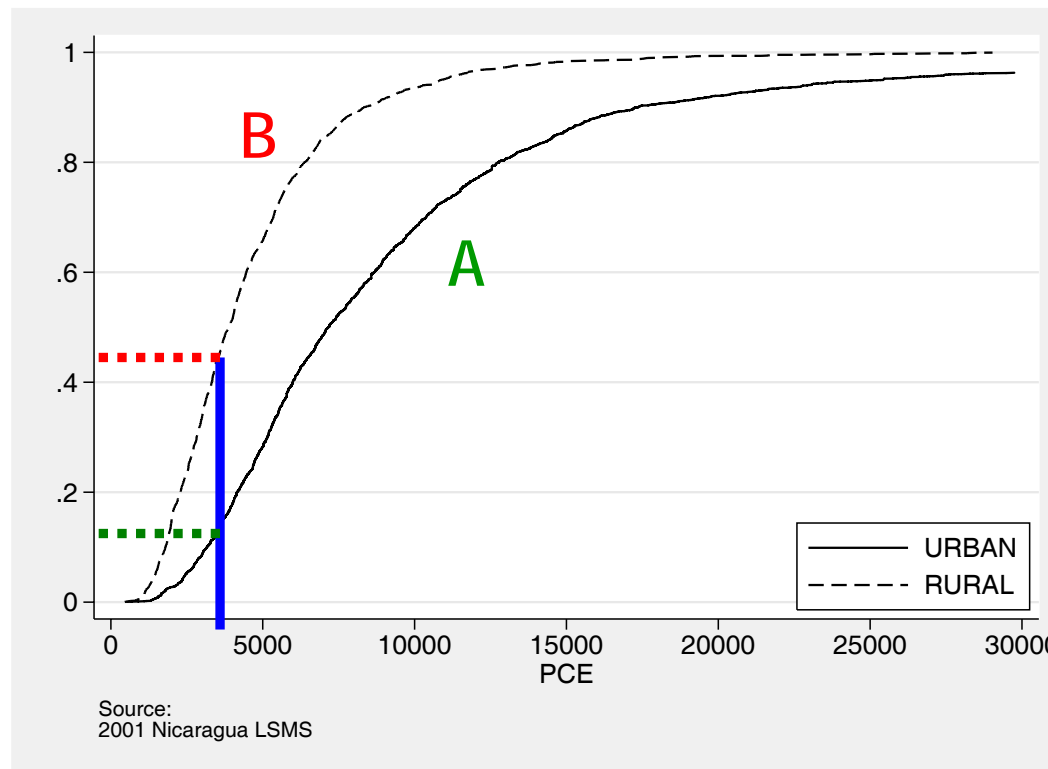


FIRST-ORDER STOCHASTIC DOMINANCE (FOD)

- We say that F_A first-order stochastically dominates F_B if and only if, for all positive x :

$$F_A(x) \leq F_B(x)$$

For instance, **A** could be the distribution of PCE for urban households, **B** for rural.





ATKINSON (1987) “Condition I”

We are interested in comparing two distributions, F and F^1 , denoting the difference $\Delta F = F - F^1$.

CONDITION I: *For there to be for all $Z \in Z^*$ a reduction, or no increase, in poverty, as measured by the headcount, on moving from the distribution F^1 to F :*

$$(I) \quad \Delta F(Z) \leq 0 \quad \text{for all } Z \in [Z^-, Z^+].$$

The poverty **ranking** of two distributions according to headcount ratio **does NOT depend** on the choice of the **poverty line** if and only if one distribution **FOD** the other.



FOD

“Condition I” in practice

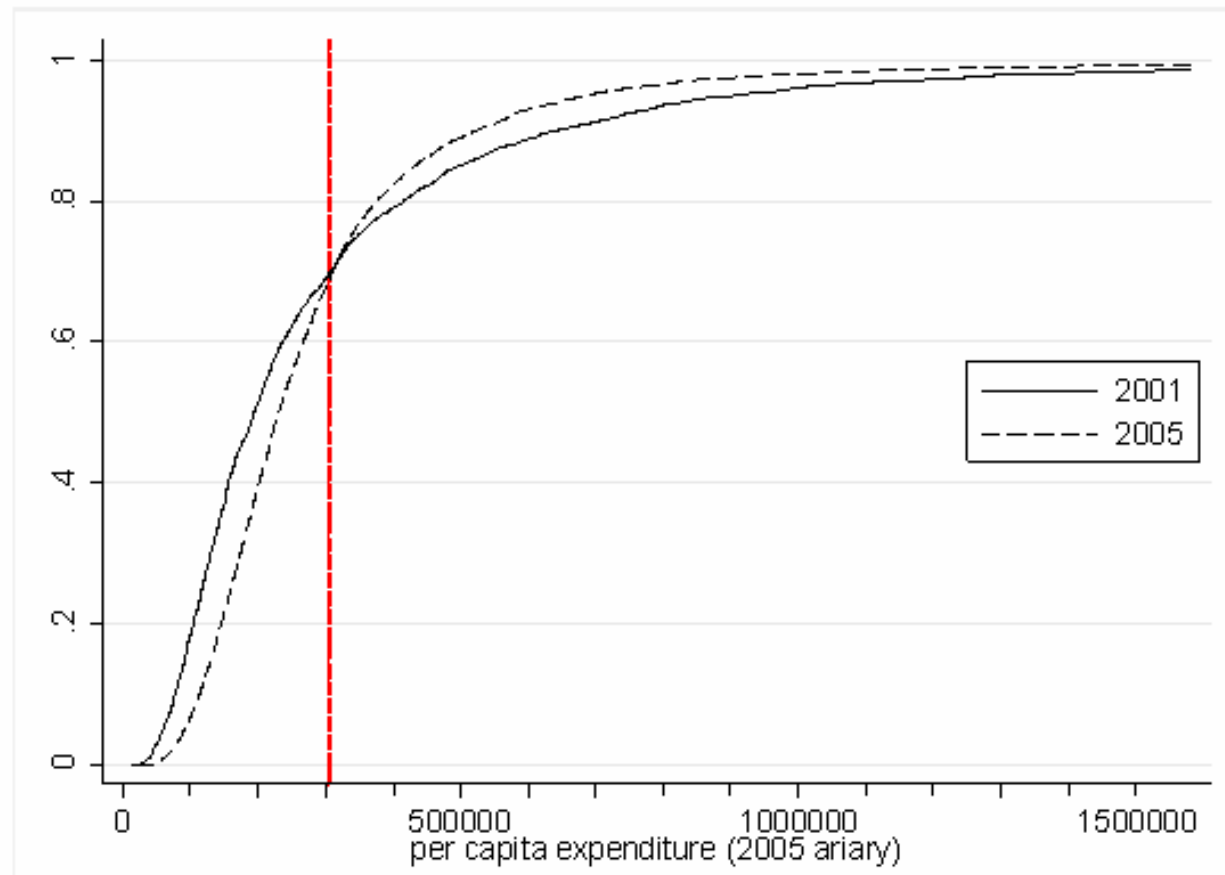
1. All we have to do to test the **robustness** of the **headcount ratio** is to plot the CDFs of the two distributions that we are interested in comparing.
2. If one lies above the other over the range of relevant poverty lines, then the choice of poverty line within that range will make no difference to the outcome.



FOD

poverty incidence curves

Figure 4 – First-order stochastic dominance test, Madagascar 2001-2005





ATKINSON (1987) “Condition I”

If two distributions **cross** within the range of poverty lines $[Z^-, Z^+]$, then FOD does **not** hold: the choice of different poverty lines combined with the use of the headcount poverty ratio will lead to different rankings of the two distributions.

Can we do any better by adopting a different poverty measure?



SECOND-ORDER STOCHASTIC DOMINANCE (SOD)

- To define SOD, we start by defining the **poverty deficit curve** $D(z;F)$:

$$D(z;F) = \int_0^z F(x) dx$$

The poverty deficit curve is the **area under the CDF** up to some poverty line z .

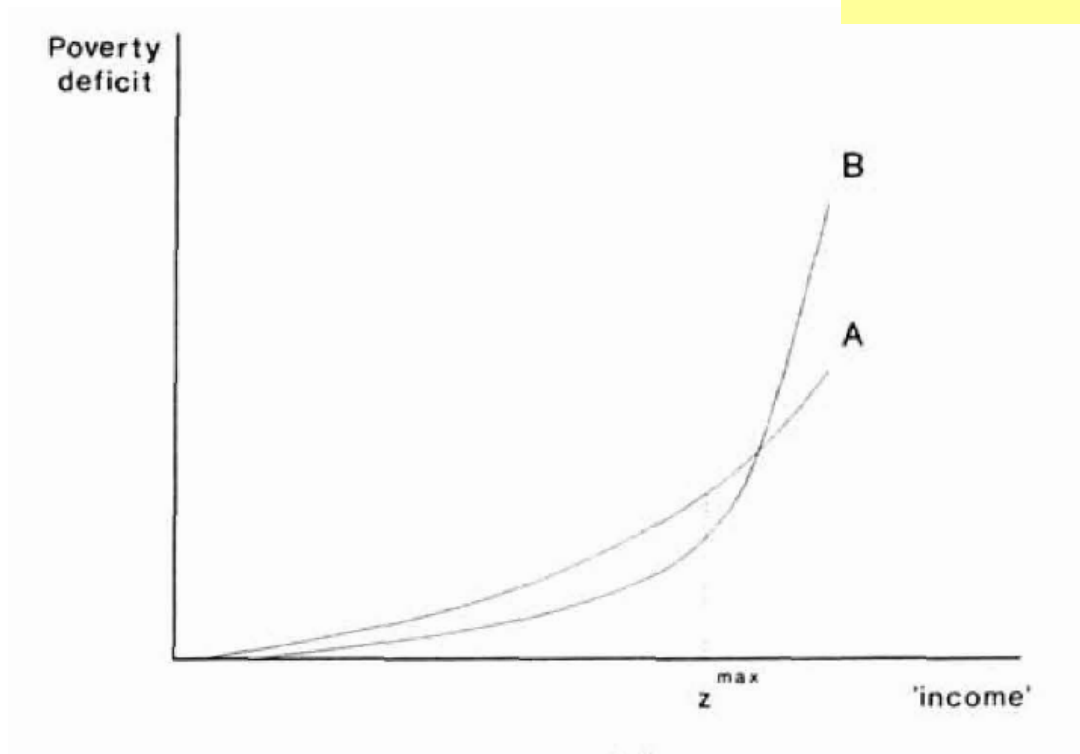
If $D_A \leq D_B$ for all x (*i.e.* the area under **A** up to x is less than the area under **B** up to x), then distribution **A** is said to **second-order stochastically dominate** distribution **B**.



SECOND-ORDER STOCHASTIC DOMINANCE (SOD)

- Remember the definition:

$$D(z; F) = \int_0^z F(x) dx$$



$$D_B \leq D_A$$

then

B SOD A



ATKINSON (1987) “Condition II”

CONDITION II: *For there to be for all $Z \in Z^*$ a reduction, or no increase, in poverty, as measured by the poverty deficit, on moving from the distribution F^1 to F :*

$$(II) \quad \Delta\Phi(Z) \equiv \int_0^Z \Delta F(Y) dY \leq 0 \quad \text{for all } Z \in [Z^-, Z^+].$$

If the **poverty deficit curve** for one distribution lies above the poverty deficit curve of another, the first distribution will always have more poverty as measured by the poverty gap measure.



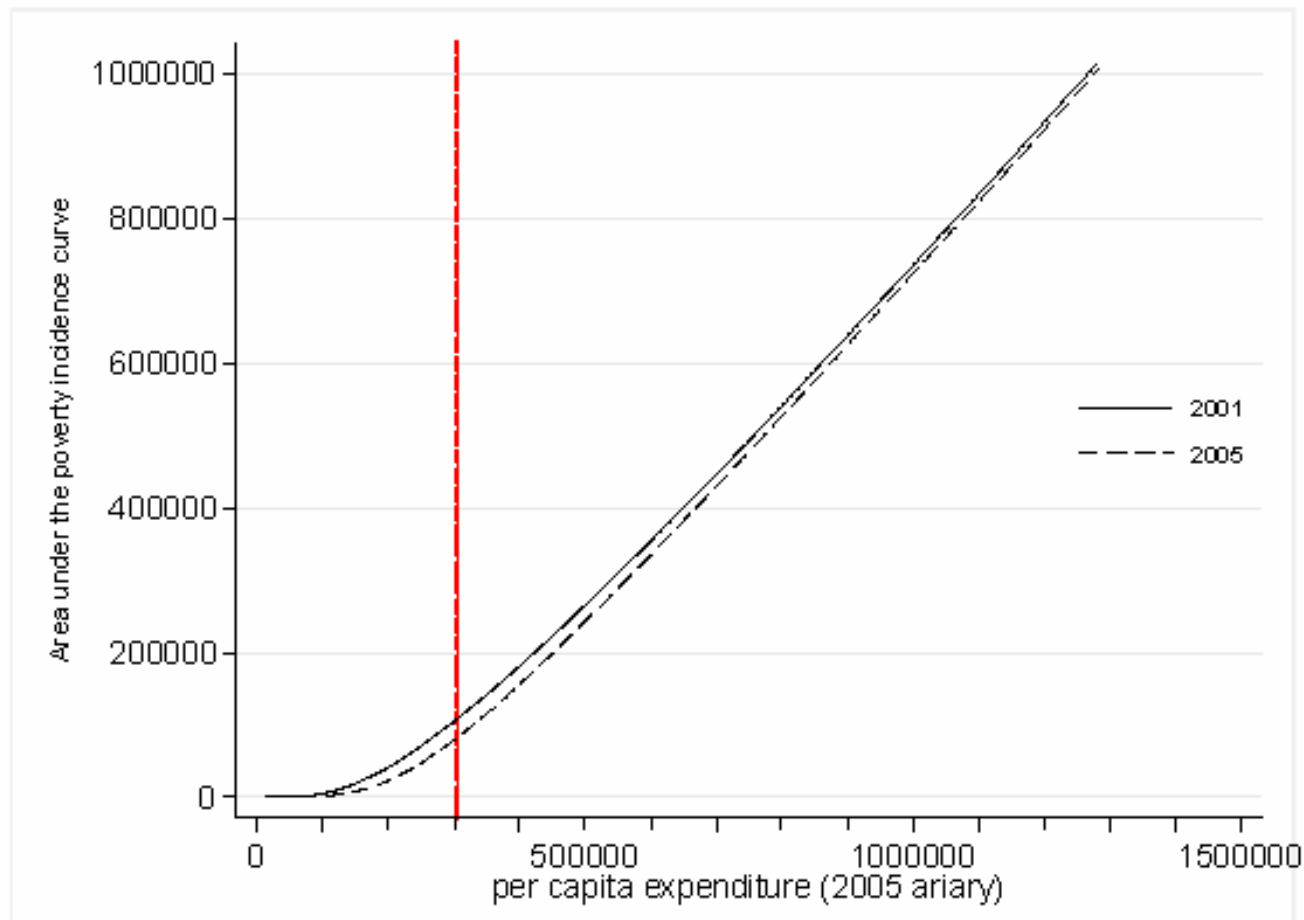
ATKINSON (1987)

“Condition II” (In Practice)

- ▶ All we have to do to test the **robustness** of the **poverty gap index** is to **plot the PDCs (poverty deficit curves) of the two distributions** that we are interested in comparing.
- ▶ If one lies above the other over the range of relevant poverty lines, then the choice of poverty line within that range will make no difference to the outcome: the first distribution will always have more poverty according to the poverty-gap measure.



POVERTY DEFICIT CURVES in practice



Deaton (1997:166)
shows that:
 $D(z;F) = z \times PG$

The PG ratio is
higher in 2001 than
in 2005, regardless
of the poverty line



COMPARING THE DIFFERENT ORDERS OF DOMINANCE

▶ FOD \Rightarrow SOD \Rightarrow TOD



LIST OF PAPERS CITED

- **Atkinson, A.B. (1987)**, “On the Measurement of Poverty”, *Econometrica*, 55(4): 749-764.
- **Ravallion, M. and B. Bidani (1994)**, “How Robust Is a Poverty Profile”, *The World Bank Economic Review*, 8(1): 75-102.