

Combined multidimensional poverty measurement. The Mexican experience

Julio Boltvinik
El Colegio de México
julio.boltvinik@gmail.com

Presentation contents

1. Introduction. Combined Multidimensional Poverty Measurement (CMPM) is prescribed by law in Mexico. Two *official* CMPM Methods (CMPMM) have been applied in Mexico.
2. Origins and problems posed by multidimensionality. Critique of the monetary solution (MS)
3. Principles and good practices which I have developed in my search for a better solution to the problems posed by multidimensionality.
4. The Federal Government (Coneval) modified truly poor approach. Description and critique
5. The Integrated Poverty Measurement Method (IPMM) adopted by the Mexico City Government. Description and appraisal.

1. Introduction

- CMPMM are now in fashion, although the World Bank and ECLAC are still measuring poverty unidimensionally: income as the sole variable; PL as the sole threshold. This is the *monetary solution* I criticize below.
- In LA a CMPMM was developed and applied by a regional UNDP project in 1990-1992, which I call IPMM original variant (IPMM-OV), but not adopted by ECLAC. I developed it to obtain IPMM-IV (improved variant) and applied it since 1992.
- In 2003-04 the General Law for Social Development was approved by Mexico's Congress. It stipulates that *official* poverty measurement should be based, *at least*, on 8 indicators (one of which is income) which it lists, thus establishing a CMPMM as the *official type of method*. It created also a new organism, *Coneval*, which is responsible of measuring poverty and evaluating social development programmes and policies. Coneval was established in 2006. It developed a CMPMM and applied it to measure poverty in Mexico using a 2008 survey. I call their method "modified *truly poor*", following the name Nolan & Whelan used for their set-intersection-poverty-criterium-method which, since then has been also applied (with changes) by the 'Bristol group' (Gordon, Pantazis, Levitas, *et al.*) and by Halleröd. The equivalent to *Coneval* at the Mexico City government (*Evalúa DF*) adopted IPMM-IV as its official method and applied it for Mexico City and national data in the 2008-2012 period.

2. Origins and problems of multidimensionality

1. **Multiple human needs** (e.g. Maslow's 7 needs or Max-Neef 10 needs), met through **diverse satisfiers** (goods & services, relations, activities, theories, capacities, institutions) made possible by a **plurality of resources/well-being sources (WBS)** (see below).
2. **Limits of markets** → exchange value is not universal (some use-values are not exchange-values, are not bought and sold) → money cannot measure everything (e.g. some satisfiers) some WBS are not expressible in money terms.
3. The ***monetary solution*** negates 1 & 2 (next slide).
4. 1 & 2 imply that observable variables for Poverty Measurement (PM) might be **nominal/ordinal or cardinal**; this **heterogeneity** requires a solution.

Critique of the monetary solution (MS)

The monetary solution to the problem of heterogeneity in the dimensions of well-being, implies the following assumptions: 1) Only material **N** should be considered; 2) G&S are the only **S**; 3) income is the only **WBS**; 4) markets are universal: every **N** is satisfied through them; 5) income is the natural indicator of **WB**; 6) **WB** is proportional to **Y**. Assumptions 1 to 3 constitute the reductionism of the MS. Recognizing the limits of markets (rejecting assumption 4), implies that not only the total sum of **WBS** matters but its composition as well. Assumption 5 is rejected by Foster/Sen: “the metrics of exchange value cannot give us interpersonal well-being comparisons”. N° 6° goes against common sense and against the tradition of the diminishing marginal utility of income which implies that **Y** cannot be used to evaluate WB without being modified.

3. Principles and best practices I have developed in the search for an optimal solution to problems posed by MPMM

The Principles of Poverty Measurement

1. *Principle of Totality: All Needs, All Satisfiers, All Sources of Welfare (Resources)**
2. *Pr. of Diminishing Marginal Well-Being and of the Existence of a Maximum Well-Being Level.**
3. *Pr. of Comparability of Well-Being. (indicators must be re-expressed in W-B terms to be comparable)**
4. *Pr. of the Minimal Error**
5. *Pr. of replicable full cardinalization or generalised dichotomisation**
6. *Pr. of the Entangled Nature of the Poverty Concept**
7. *Pr. of Dignity in the Definition of Poverty Thresholds*
8. *Pr. of poverty as part of the Living Standard Axis*
9. *Pr. of Symmetry**

Principles and good practices of MPM

Principles

Good practices (MPMM should...)

I. Conceptual

1. Totality (All needs, all satisfiers, all well-being sources)

1. Be integral. 2. Be sensitive to economic crises

2. Comparability of objective well-being

3. Be based on an objective (not policy) definition of poverty

3. Entangled nature of the concept of poverty

4. Be based in solidly based (avoid arbitrary) value judgements

4. Dignity, main criterium to define poverty thresholds

5. Promote human rights. 6. Promote optimal public policies

5. Poverty is part of the living standard axis

7. Include all living standard dimensions (not poor dimensions)

6. Full Normativity (new principle)

8. Be fully normative (avoid observed parameters as standards)

II. Methodological

7. Decreasing marginal well-being above the thresholds

9. Become also a stratification MM (aplying principles 7, 8 & 10 and avoiding dichotomies)

8. Existence of an objective well-being maximum

9. Minimum error

10. Use information fully and non-skewed (by cardinalizing)

10. Replicable cardinalization

11. Symmetry

11. Attain full consistency of concepts & procedures

Note. Because of time restrictions I will only broach two of the 11 principles in some detail. In the printed materail, you have a full discussion of all principles, except the 'new principle' of full normativity.

Principle of Totality

All Needs (N): depart from the complete human being with all his/her **N** (survival/material; cognitive; emotional/esteem; growth/self-actualisation) without cutting off her/his brain, heart, genitals; without reducing him/her to cattle.

All Satisfiers (S), not only goods and services (objects), but including *relations; activities; capacities; institutions; knowledge/theories.*

All well-being sources (WBS) or resources (*income; basic assets; non-basic assets; free goods and services; available/free time; knowledge/skills.*)

Corollary: poverty is the incapacity of the household/person (given the totality of its WB sources) to satisfy all **N**.

Pr. of Totality: Holistic vs. reductionist view of the process of needs' satisfaction

Types of needs (N) (examples of each type)	Type of satisfiers (S) principal/ <i>secondary</i>	Resources (well-being sources, WBS) Principal/ <i>secondary</i>
Survival or material (food, shelter, safety/security)	1. Objects (food, housing, security services); 5. Institutions (family/insurance) <i>3. family activities (buying, cooking; cleaning)</i>	Conventional Economic Resources: CY, BA, NBA, FGS* <i>time; knowledge/skills</i>
Cognitive needs (knowing, understanding, education)	3. Subject's activities (reading, studying, researching) 6. Knowledge, theories <i>1. Objects (education, books)</i>	Time; knowledge and skills <i>Conventional economic resources. CY, NBA, FGS*</i>
Emotional and esteem needs (affect, friendship, love, belonging, reputation)	2. Primary and secondary relations <i>3. activities with partner/ friend</i> <i>4. Capacities, 1. objects</i>	Time; knowledge/skills <i>Conventional economic resources, CY, NBA*</i>
Growth needs (bases of self-esteem: achievements) self-actualisation)	3. Subject's Activities 4. Capacities <i>3. Work</i> <i>2. Secondary relations. 1. Objects</i>	Time, knowledge/skills <i>Conventional economic resources, CY, NBA*</i>

*CY: Current income; BS: Basic Assets; NBA: Non-basic Assets; FGS: Free goods and services

Principle of full replicable cardinalization or generalised dichotomisation

- In almost all MPM ordinal variables are dichotomised: the worse solution is given a deprivation score of 1 and a 0 score is given to the solution at the threshold, but intermediate solutions are also given a score of 1 even though they would require intermediate scores –like 0.3, 0.7. Equally, the solutions which are better than the norm are given a score of 0 although they would deserve negative deprivation scores.
- This implies an enormous *loss of information which denies the principle of the minimal error (PME)* and skews the results. In IPMM I have been applying a full cardinalization which rescues intermediate values and applies the PME. When James Foster (2007) cast doubt on the replicability of my procedure, I developed a full replicable cardinalization procedure or *generalised dichotomisation*, which I explain now.

Procedure for Generalised Dichotomisation
(replicable full cardinalisation).

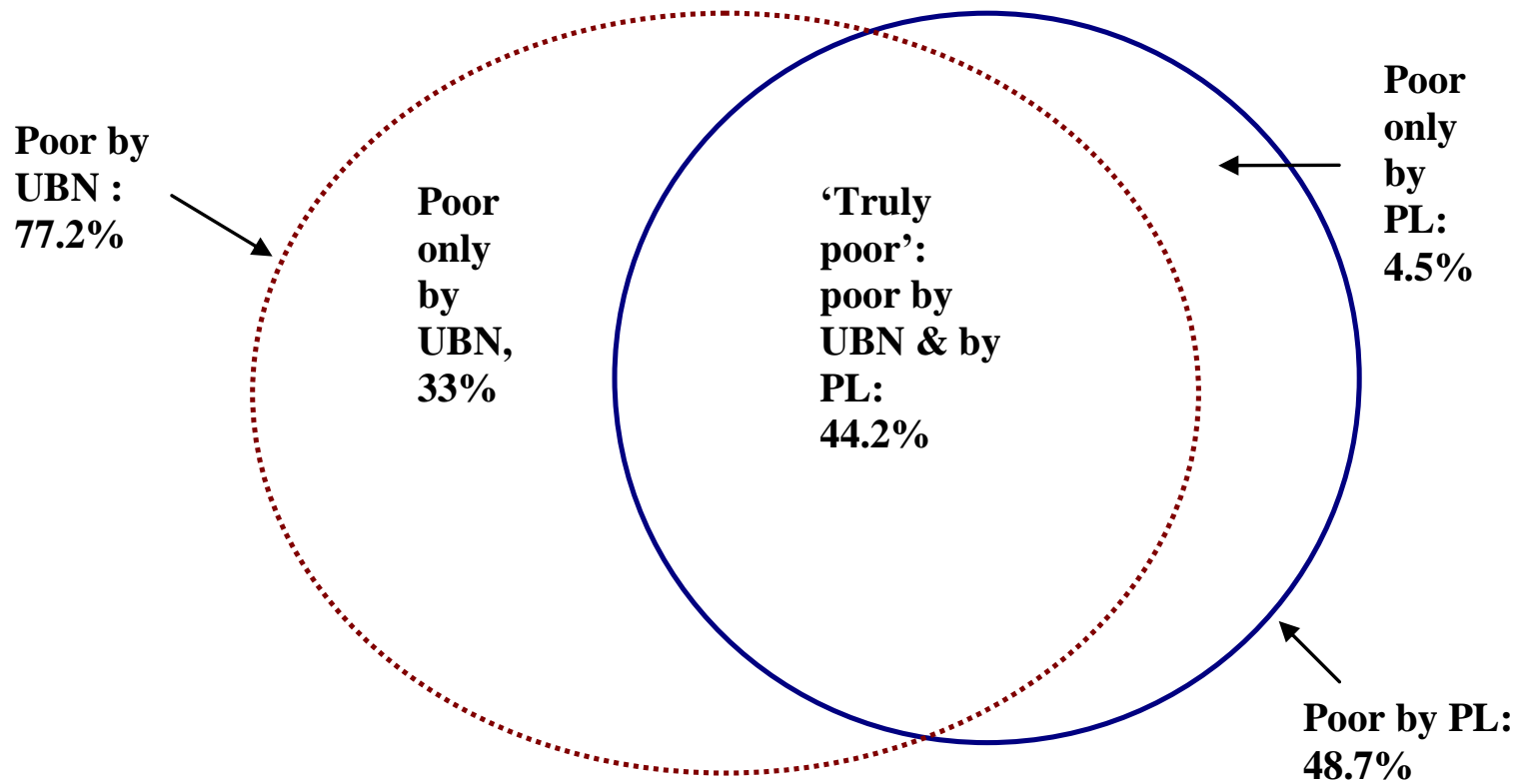
(The data in the cells show dichotomic achievement scores in the 6 dichotomies)

Solutions arranged from worse to better in terms of <i>objective well-being</i> :	Alternative standards or thresholds used to dichotomise (all except for the worst)						Sum of scores for each solution Σ	Standardised score ($=\Sigma/3$) <i>Cardinal score sought</i>
	Dichotomic scores (0,1) each solution obtains when the standard (threshold) used is:							
	B	C	D	E	F	G		
A (the worst)	0	0	0	0	0	0	0	0.000
B	1	0	0	0	0	0	1	0.333
C	1	1	0	0	0	0	2	0.666
D (authentic threshold)	1	1	1	0	0	0	3	1.000
E	1	1	1	1	0	0	4	1.333
F	1	1	1	1	1	0	5	1.666
G (the most luxurious)	1	1	1	1	1	1	6	2.000

4. “Modified truly poor”. The official method adopted by Coneval)

As stated, by law poverty measurement in Mexico has to be multi-dimensional and has to be carried out by a semi-autonomous agency: *Coneval*. The **official method** announced by Coneval in December 2009 *is a variant of the intersection approach or truly poor*, thus it *underestimates poverty*: in order to be considered poor a household/person has to be both below the PL and deprived in 1 or more (of a total of six) UBN dimensions defined in the Law. But *within UBN the method adopts a union approach*, in which it is enough to suffer one deprivation to be considered deprived, *overestimating deprivation in this dimension*. To compensate for this, UBN thresholds are set at a very low level indeed. As shown in the next slide, population in the non-intersected portions of both sets (cells 1.2 & 2.1 in a contingent table) are considered *vulnerable (but not poor)* thus creating a dual calculation of disadvantage: ***poverty & poverty + vulnerability***.

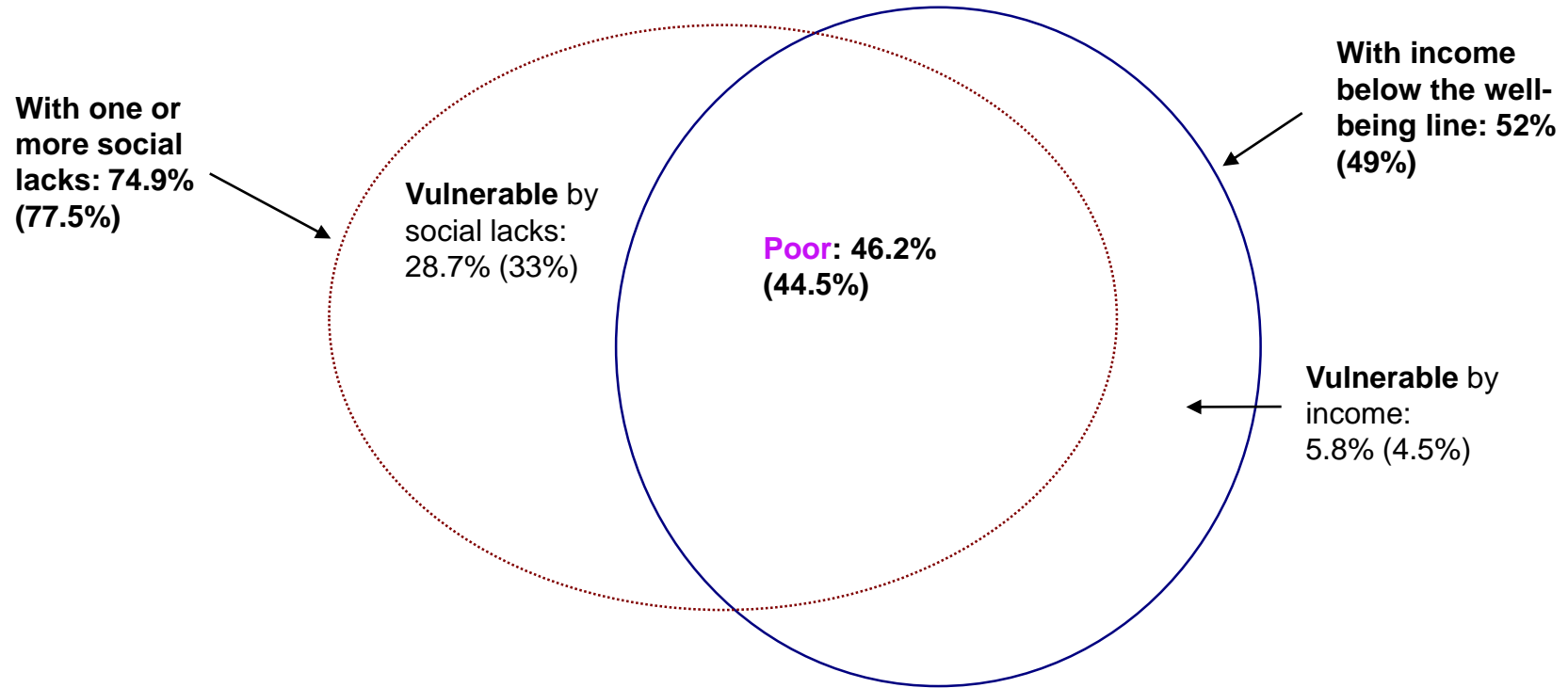
**Minimising poverty in Mexico (2008):
The Official (Federal) Mexican Multidimensional Method.**



What is the *real* level of poverty? The intersection criterion renders 44.2%; the union approach 81.7%. It is intuitively obvious that the true level is between 48.7% and 77.2% (say around 63%). So the government minimised poverty in 19 percent points.

Intersection criterium of poverty in Coneval's Method.

Data for 2010 (2008 in parenthesis)



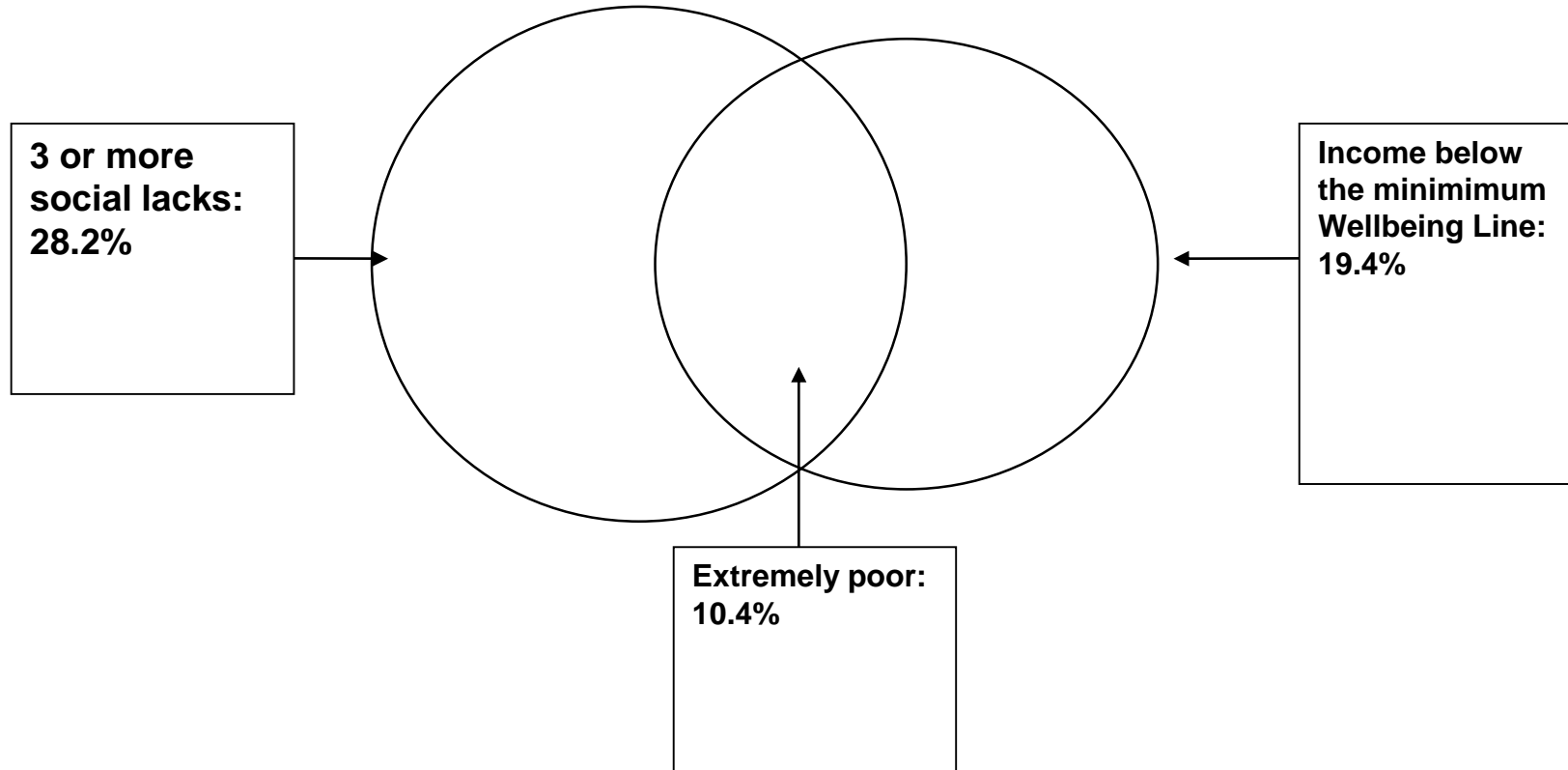
Two sets of deprived population, their Ssm, intersection and union in Coneval's MPMM 2008-2010 (%)

Concept/year	2008	2010	2010 minus 2008
1. % of population with one or more social lacks	77.5	74.9	-2.6
2. % of population below the Well-being Line	49.0	52.0	+3.0
3. Sum of the two sets (= 1+2)	126.5	126.9	+0.4
4. Intersection of the 2 sets	44.5	46.2	+1.7
5. Union of the two sets (= 3-4)	82.0	80.7	-1.3

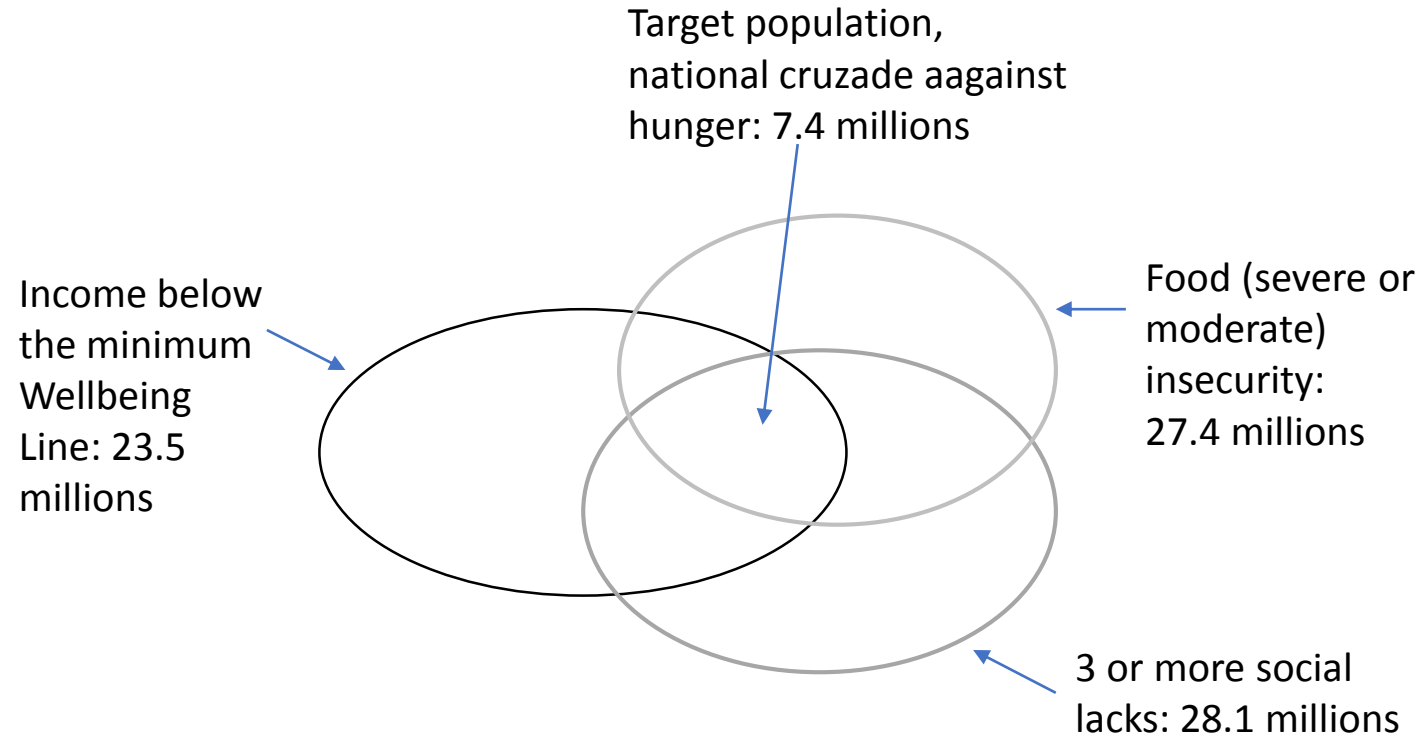
Minimalism in thresholds

- Both in UBN and Income, Coneval defined very low thresholds
- In income, the WBL is around twice the cost of a (raw) food basket, which implies an Engel Coefficient of 0.5 only observed in the 10% poorest households. THE MWBL is the cost of the basket, which assumes HH can spend 100% of their income in raw food.
- Despite having performed two national surveys to determine UBN thresholds, Coneval put the results aside (they were too high) and defined arbitrary low thresholds.
- Examples of very low UBN thresholds are grammar school as minimum education for adults born before 1982; Seguro Popular as a threshold level solution to health services; tubed water outside the dwelling as acceptable water solution; as social security threshold if the person (>65 years) receives a cash transference without considering the amount.
- Dichotomisation forces impossible solutions (e.g. Should we score 0 or 1 to Seguro Popular?)

Coneval's miraculous method minimizes *extreme poverty*. 2010



Tragicomic *reductio ad absurdum* of the intersection approach.
The National Cruzade against Hunger



4. IPMM, more than a MDPMM. Some outstanding features.

- IPMM includes not only UBN and PL dimensions but adds free/available time (on This see below)
- IPMM overcomes dichotomies through cardinalization
- IPMM overcomes the impossible dilemma of intersection vs. union criteria as it uses a weighted average of scores in each dimension/indicator, to obtain an IPMM score for each household, which locates it at the OWB scale (both below and above the threshold).
- Thus IPMM is not only a PMM but also a MMM for inequality/stratification, and development.

IPMM basic procedure

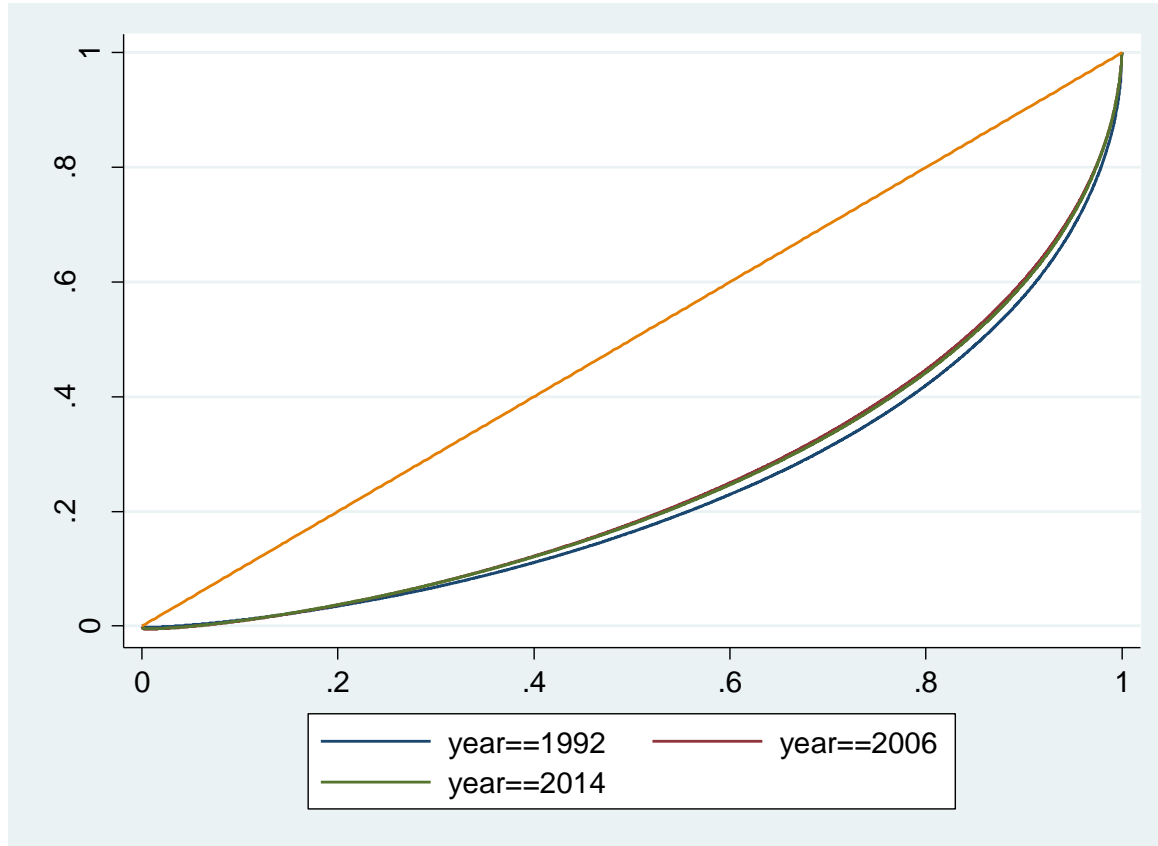
Form of verifying need satisfaction				Y Compa- rable to PL
UBN	Mixed	PL	Time	
1. Sanitary Conditions 2. Domestic energy 3. Other services (téléphone, waste) 4. Dwelling (quality and spaces) 5. Education (adults and children) 6. Furniture and domestic equipment.	7. Health and social security If person has access to IMSS/ ISSSTE needs are considered satisfied. Otherwise his/her condition is assessed on the base of his/her income.	8. Food 9. Fuel 10. Hygiene 11. Dress & shoes 12. Transport 13. Communications 14. Recreation & culture 15. Expenditures (E) on dwelling related services 16. Private E associated with health & education 17. Other required E $PL = \text{cost of } \sum 8...17$	Excess of working time (EWT), calculated on the base of legal norms and of an estimation of time required for domestic work by each HH	Disposable income after expenditures on items considered in UBN or mixed procedures $Y - E(UBN+7) \geq < LP$
I(UBN) by HH: weighted average of I from 1 to 7.	Income-time poverty, I(PLT) > 0, if $[Y - E(UBN)]/EWT \leq LP$; I(PLT) is rescaled: I'(PLT)	I(IPMM) = A * I(UBN) + B * I(PLT)		

Strategic importance of including time in IPMM. It's meaning

- IPMM is more than a PMM: it also measures inequality and development in terms of an OWB *hybrid* concept (i.e. that combines factual OWB with potential OWB). (see next slides). Instead of IPMM it is IPIDMM. Two of the three components of IPMM, income (Y) and free time (FT), approach potential OWB, while UBN approaches factual OWB. If the HH/person has satisfied the N that the IPMM verifies by UBN and, in addition, has adequate levels of Y and T that allow it potentially to satisfy the other N, the HH/person will not be poor, will have a hybrid OWB above the threshold.
- But you might ask, How can I state that IPMM covers emotional and self-actualisation N if it does not use specific indicators for them? The answer is that, in the same way that in income PM, once the PL is defined (the minimum income that allows the HH to acquire the S of the N usually satisfied through the market), we then compare Y of each HH with PL to identify the (potential) poor, without elaborating specific indicators for each group of satisfiers (food, clothing, transport, energy, etc.), in terms of time, the main WBS for the satisfaction of emotional and self-actualization N, once a FT threshold is defined as the minimum that potentially allows the HH/person to satisfy those N that centrally require the use of personal time, we can consider those on or above the threshold as not FT poor. **IPMM covers, then, all N.** As all potential concepts of poverty it does not observe what HH actually do with the FT they have, in the same way as income poverty does not require us to observe how HH spend their income and how they use the commodities bought.

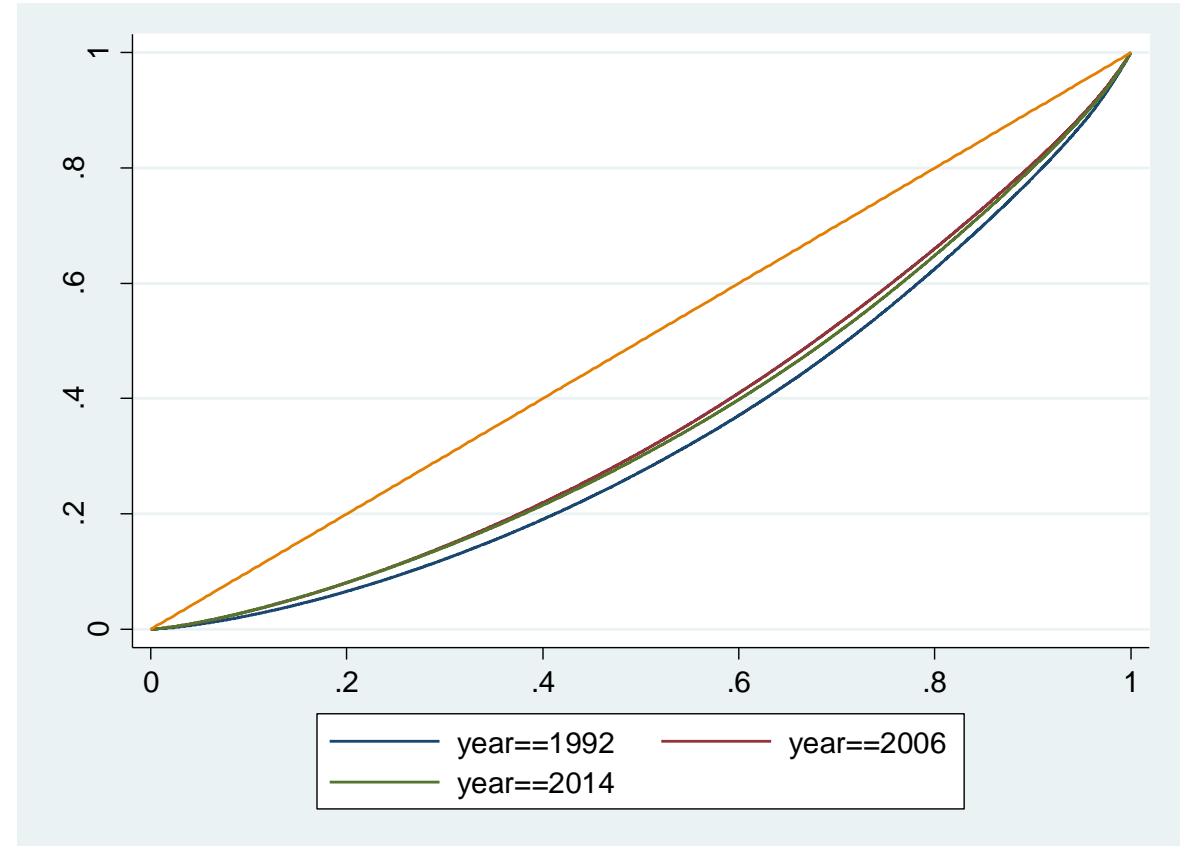
Lorenz Curves. Income and IPMM scores

Income (Lorenz Curves).



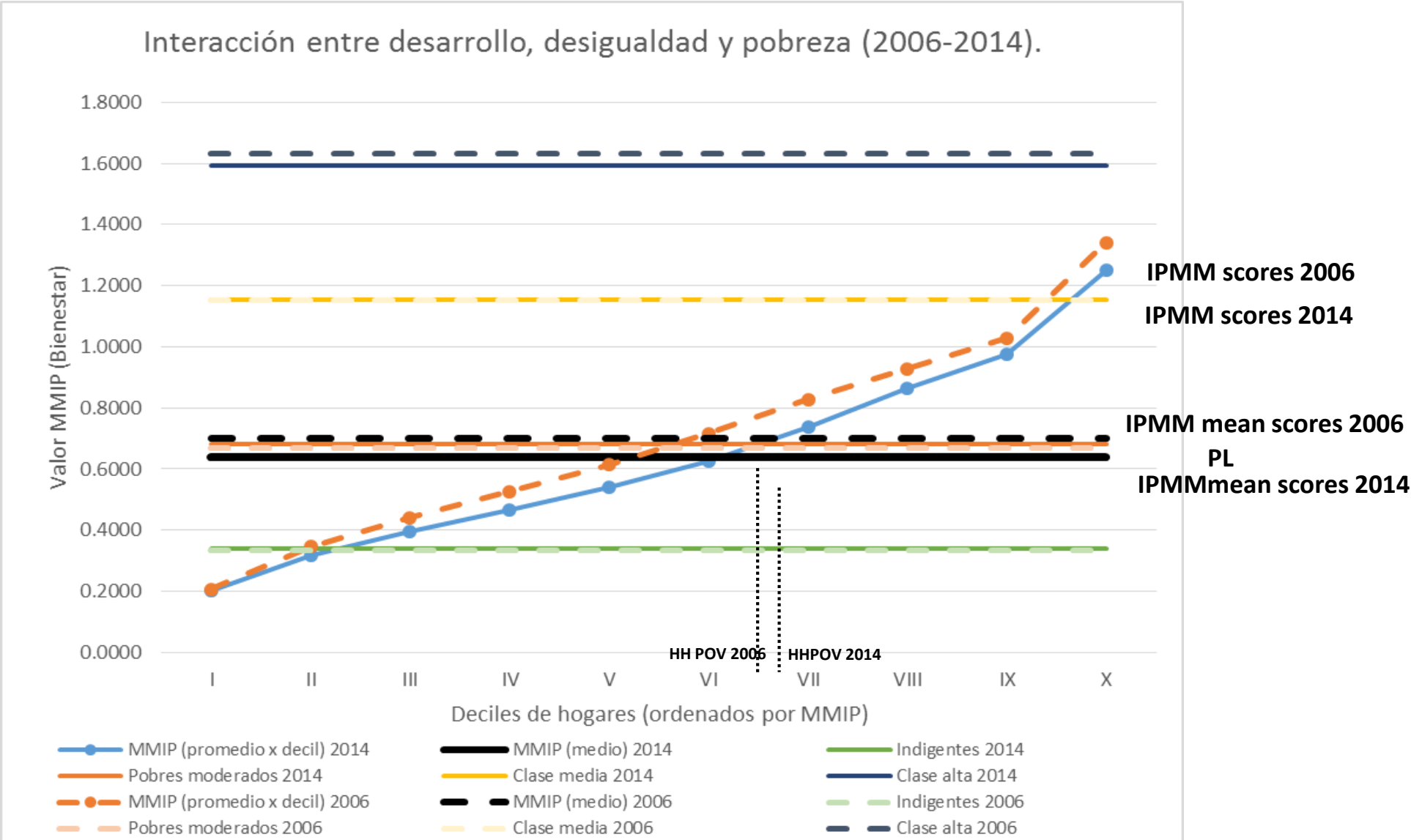
*Inequality increased 1992- 2006,
2006- 2014 constant.*

**IPMM scores
(Lorenz Curves)**



*Inequality decreases 1992- 2006
Increases slightly 2006- 2014.*

Interaction amongst Dev., P & Ineq. (based on IPMM scores by HH)



The unfinished agenda. Can IPIDMM integrate subjective WB?

At present, I am struggling to:

- 1) Integrate SWB measures (specifically the most developed forms of it, like Kahneman's objective happiness or Seligman's MDWB) into IPIDMM, which could then be called Holistic IPIDMM or HIPIDMM.
- 2) Solve the riddle of how virtues and character strengths (what one structurally is) to WB (how one lives currently).
- 3) Solve the enigma of how HIPIDMM relates to my Human Flourishing Approach based on Marx-Márkus concept of Development of Human Essential Forces.

This is all. Thanks for paying attention

Well-being sources & the critique of ‘partial poverty measurement methods’: point of departure of IPMM.

Type of WBS		Specific WBS	Methods which take into account specific WBS	Consequences
‘Eco- nomic’ resourc es	Private	1. Current monetary and non-monetary income	PL (income poverty)	<p>PL only considers source 1 and, sometimes, source 2.</p> <p>UBN-OV usually considers sources 3 & 4 and sometimes source 5</p> <p>None takes into account available free time (source 6).</p> <p>In consequence, both methods are partial and order HH incorrectly; they are not alternatives but complementary methods.</p>
		2. Non-basic assets	PL (only when measured using consumption expenditures instead of income)	
		3. Basic assets	UBN-OV	
	Public	4. Access to free goods and services (public consumption)	UBN-OV	
“Capacities”		5. Knowledge and abilities	UBN-OVNBI (some applications)	
Available Time		6-Free time	None	

The well-being sources

Well-being of a Household (HH) or a person, depends on the following well-being sources:

- a) Current income
- b) Basic assets
- c) Non-basic assets
- d) Access to free goods/services
- e) Free/available time
- f) Knowledge and abilities