Simple Poverty Scorecards

Mark Schreiner
Microfinance Risk Management, L.L.C.
http://www.microfinance.com

19 October 2007, Bern, Switzerland
Savings and Credit Forum/SDC/Intercooperation

<u>Why</u> Measure Clients' Poverty?

1. **<u>Millenium Development Goals</u> (halve # < $1/day)**

2. **<u>Microcredit Summit</u> (track 150 million microfinance clients crossing $1/day line)**

3. **<u>Bilateral donors</u> (require reporting % poor)**

4. **<u>Triple bottom line investors</u> (cross-check claims, social rating by MiX, M-CRIL, Microfinanzas, etc.)**

5. **<u>Managers/Paris Declaration</u> (make management of depth of outreach more transparent and verifiable and thus more explicit and intentional)**
   — **Accountability (politics, society, manager decisions)**
   — **Achieving mission of impact on poverty?**

Microfinance Risk Management, L.L.C.

Paris Declaration: Principles

- **Manage for results (donors and MFIs):**
    - — **'You should try to achieve your mission'**
    - — **'You manage what you measure'**
    - — **Report transparent, verifiable info., for status now, change, and targets (inter- and intra-country)**
    - — **Trade-offs: Who to fund, what areas to fund?**
    - — **Impact: Key is not indicators but control groups**

- **Alignment:**
    - — **Un-tie aid (donors make local govt. goals their own)**
    - — **Build on local methods for measuring, reporting**

- **Harmonisation:**
    - — **Reduce duplicated 'poverty diagnostics'**
    - — **Common set of reporting requirements**

Microfinance Risk Management, L.L.C.

Paris Declaration & Poverty Scoring

Scoring measures poverty status simply and inexpensively

- **Alignment:**
  — Local govts. focus on change in % below national poverty line
  — Can construct scorecards locally and/or customize to region/org.
  — Fill-in-blank, do-it-yourself tool (to be done)

- **Harmonisation:**
  — 10 indicators (vary by country, but not much)
  — Calibrated to $1/day and national poverty line
  — Works for all, not just microfinance
  — Can aggregate $1/day results across organizations or countries

- **Manage for results:**
  — Summary of depth (by country, org., branch, field agent, etc.)
  — One simple number that is transparent, verifiable, and valid for inter- and intra-country for current status, change, and targets
  — Given a good control group, scoring can help measure impact

Microfinance Risk Management, L.L.C.

PROBLEM: Direct Measures Are Costly

1–2 day household expenditure survey

Last week, did you eat carrots? How many?

Did you buy them? What price would you have paid, if you had bought them?

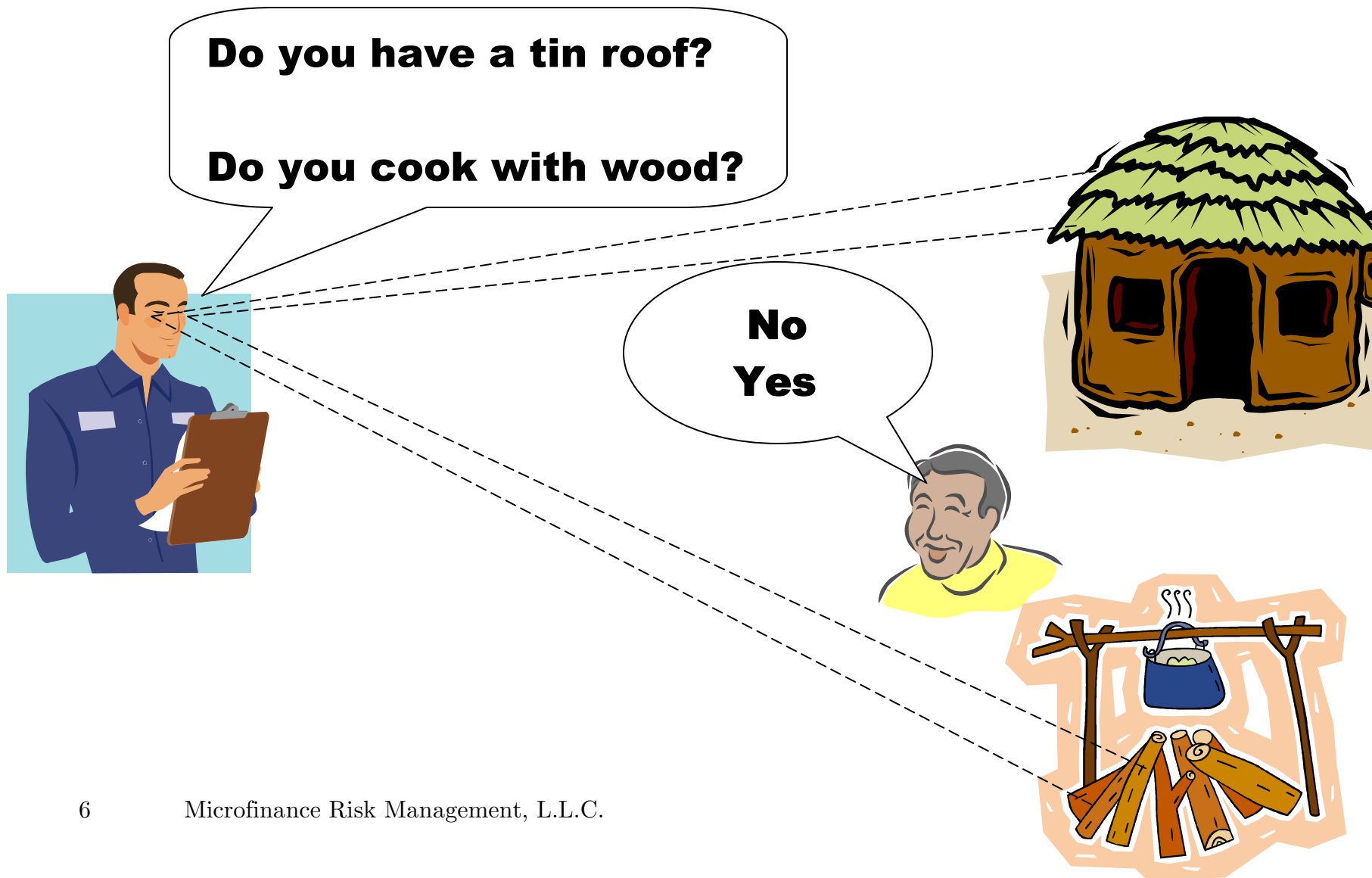Yes. Ummm, 5, I think.

No. I don't know.

Microfinance Risk Management, L.L.C.

SOLUTION: Indirect Scoring Costs Less

5–10 minute scorecard with observable indicators

Do you have a tin roof?

Do you cook with wood?

No
Yes

Microfinance Risk Management, L.L.C.

Features of Poverty Scorecards (PPIs)

1. *Objective*: Based on national survey data:
   — LSMS-type expenditure measurement
   — Quantitative, observable indicators

2. *Accurate*: Estimates are (90% confidence, n>5,000):
   — +/– 10 pct. points, individual poverty likelihood
   — +/– 2 pct. points, group poverty rate

3. *Practical*: Accepted and actually used:
   — Indicators are few and inexpensive-to-collect
   — Simple enough to understand and compute on paper, in the field, in real time (no software)

4. *Universal*: For all, not just microfinance

Microfinance Risk Management, L.L.C.

Three Uses of Poverty Scoring

1. *Target services* (classify individuals):
   — If score < cut-off, treat as if poor *for program purposes*
   — Managers choose program's cut-off

2. *Measure poverty rates*:
   — Report USAID, MiX, Microcredit Summit
   — Managers set goals and track progress

3. *Track changes in poverty over time*:
   — Measure poverty rates for a group twice
   — Look at change in poverty rates

Microfinance Risk Management, L.L.C.

Bangladesh Scorecard

Indicator	Value	Points	Total
1. What type of latrine does the household use?	Open field	0	
	Kacha (temporary or permanent) or pit Pacca	8	
	Sanitary or water-seal Pacca	15	
2. How many household members are 11 years old or younger?	Four or more	0	
	Three	7	
	Two	12	
	One	19	
	Zero	27	
3. Does any household member work for a daily wage?	Yes	0	
	No	9	
4. How many rooms does the house have (excluding ones used for business)?	One	0	
	Two or three	3	
	Four or more	12	
5. Do all children ages 6 to 17 attend school?	No	0	
	No children ages 6 to 17	4	
	Yes	5	
6. Does the household own a television set?	No	0	
	Yes	13	
7. How many decimals of cultivable land does the household own?	Less than 34	0	
	34 to 99	2	
	100 to 199	4	
	200 or more	6	
8. What is the main construction material of the walls of the house?	Hemp/hay/bamboo or mud brick	0	
	C.I. sheet/wood	6	
	Brick/cement	7	
9. Does the household own any cattle?	No	0	
	Yes	2	
10. Does the house have a separate kitchen?	No	0	
	Yes	5	

Total:

Microfinance Risk Management, L.L.C.

Scoring Uses Natl. Survey Data

- **Bangladesh derived from 2001 'Household Income and Expenditure Survey' by Bureau of Statistics**

- **7,440 households**

- **Includes costly LSMS-type expenditure module**

- **Analyst uses statistics (logit regression) to select indicators and assign points to accurately relate indicators to known poverty status for surveyed HH**

- **Analyst does not 'make up' points or pick indicators based only on judgment or other countries**

- **Scorecard derived from 2001 national expenditure survey is then applied to people today**

Microfinance Risk Management, L.L.C.

How Are Indicators Selected?

'Practicality', not just accuracy

Pick indicators strongly linked with poverty (statistics) that also are ('experts'):

— Common sense
— Objective
— Verifiable
— Quick to ask/answer
— Liable to change over time

Microfinance Risk Management, L.L.C.

How Are Indicators Selected? (cont.)

Exclude:

— Annual expenditure on clothes & shoes

— Total value of assets

— Ratios, squares, logarithms

— Subjective judgments

— Events in the past

Include:

— Current presence of physical objects

— Objective and verifiable

— Variety

— Liable to change over time

— Related to Millennium Development Goals

How Are Points Derived?

- **Logit regression**, transformed so that:
  - — All points are zero or positive integers
  - — 0 is lowest score (most likely poor)
  - — 100 is highest score (least likely poor)

- Transformation **reduces accuracy a little** but promotes ease-of-use and **acceptance**

- Programs can download scorecard & use with **no external help** (with great effort)

- Field workers compute scores on paper, by hand, in real time; **no software needed**

Microfinance Risk Management, L.L.C.

Bangladesh Example of Use

Indicator	Value	Points	Total
1. What type of latrine does the household use?	Open field	0	**0**
	Kacha (temporary or permanent) or pit Pacca	8	
	Sanitary or water-seal Pacca	15	
2. How many household members are 11 years old or younger?	Four or more	0	**12**
	Three	7	
	Two	12	
	One	19	
	Zero	27	
3. Does any household member work for a daily wage?	Yes	0	**0**
	No	9	
4. How many rooms does the house have (excluding ones used for business)?	One	0	**3**
	Two or three	3	
	Four or more	12	
5. Do all children ages 6 to 17 attend school?	No	0	**5**
	No children ages 6 to 17	4	
	Yes	5	
6. Does the household own a television set?	No	0	**0**
	Yes	13	
7. How many decimals of cultivable land does the household own?	Less than 34	0	**2**
	34 to 99	2	
	100 to 199	4	
	200 or more	6	
8. What is the main construction material of the walls of the house?	Hemp/hay/bamboo or mud brick	0	**0**
	C.I. sheet/wood	6	
	Brick/cement	7	
9. Does the household own any cattle?	No	0	**2**
	Yes	2	
10. Does the house have a separate kitchen?	No	0	**0**
	Yes	5	

Total: **24**

What does a poverty score mean?

Score	Probability (%) poor (Natl. poverty line)
0–9	94.7
10–19	95.2
20–29	81.9
30–39	67.0
40–49	40.9
50–59	18.3
60–69	9.7
70–79	2.0
80–89	8.5
90–100	0.0

A Bangladeshi scoring 24 is 81.9% likely to be poor. (81.9% of those scoring 20–29 are below national poverty line.)

Scores can be calibrated to national poverty line(s), $1/day, etc.

Where do poverty likelihoods come from?

Score	# people surveyed below natl. line	# people surveyed overall	Probability (%) poor (Natl. poverty line)
	A	B	A÷B
0–9	461	487	94.7
10–19	2035	2136	95.2
20–29	4318	5272	81.9
30–39	4141	6182	67.0
40–49	2206	5388	40.9
50–59	838	4575	18.3
60–69	331	3401	9.7
70–79	43	2175	2.0
80–89	91	1071	8.5
90–100	0	424	0.0

- **Score of 24 corresponds to a poverty likelihood of 81.9% since 4,318 of 5,272 people in national survey (81.9%) scored 20–29 and were < national poverty line.**

Use 1. Estimate Poverty Rates

The share of clients who are poor is the average of their individual poverty likelihoods.

Bangladesh example, 3-client portfolio, 1/1/06

Client	Score 1/1/06	Poverty likelihood (%)
A	20	81.9
B	30	67.0
C	40	40.9
Average(=Poverty rate):		63.3

Given 2,000 clients and 90-percent confidence, Bangladesh estimate is **accurate to +/– 1.5 percentage points.**

Microfinance Risk Management, L.L.C.

Use 2. Track Change in Poverty Rates

(Change is not the same as impact)

Bangladesh example, 3 clients, 1/1/06 to 1/1/07

	Score		Poverty likelihood (%)	
Client	1/1/06	1/1/07	1/1/06	1/1/07
A	20	30	81.9	67.0
B	30	35	67.0	67.0
C	40	50	40.9	18.3
Average(=Poverty rate):	63.3			50.8

$(63.3 - 50.8) \div 63.3 = 19.7\%$ **of poor left poverty**

Tracking change to +/– 1.0 pct. points w/90% confidence probably requires n=10,000 to 15,000

Microfinance Risk Management, L.L.C.

Use 3. Apply Cut-Offs for Targeting

Programs can treat, *for their own purposes*, people scoring below a cut-off as 'poor':

— **Based on a program's values & mission**

— **Program choice doesn't change poverty line used to estimate poverty rates**

— **Choose to balance 'benefit' of covering poor versus 'cost' of leaking to non-poor**

— **Scoring makes explicit targeting errors that inevitably exist, helping to make targeting intentional and quantitative**

Microfinance Risk Management, L.L.C.

Options for Targeting, Bangladesh

Score cut-off	'Poor' targeted per 'non-poor' targeted
0-9	17.9:1
10-19	19.6:1
20-29	6.3:1
30-39	3.5:1
40-49	2.1:1
50-59	1.4:1
60-69	1.1:1
70-79	0.9:1
80-89	0.9:1
90-100	0.9:1

Treating those scoring ≤39 'poor' successfully targets 3.5 truly poor people for each 1 non-poor mistargeted

Microfinance Risk Management, L.L.C.

Can We Use Scoring for Targeting at All?

- **Depends on costs, benefits, & alternatives:**
  - — **Provide data on accuracy**
  - — **Let programs decide for themselves**

- **For-profiteers Visa, AmEx, etc. bet $billions on targeting daily, with less accurate scorecards**

- **Used to target public assistance to poor in Mexico, Colombia, Costa Rica, and Chile**

"Among all targeting mechanisms, proxy means tests [PPIs] produce the best incidence outcomes"
— **Margaret Grosh, World Bank targeting guru**

Implementation

- **If not used, why do it? (Buy-in and ease-of-use)**
- **Apply to sample, or all clients? How often?**
- **Data quality is paramount:**
  - — **Output only as good as input**
  - — **Quality requires training and monitoring**
  - — **Reveal indicator points to field agents?**
- **Photocopy, ask questions, add up points, apply targeting cut-off policy (if desired)**
- **File paper scorecard, and perhaps record ID data, score, and indicator values in database**
- **Use to:**
  - — **Inform management decisions**
  - — **Report poverty rates and changes**

Microfinance Risk Management, L.L.C.

Experience in pilots

Organization	Country	Info. source
1. CARD	Philippines	Lourdes Medina
2. NWFT	Philippines	Nigel Biggar, GF
3. NRSP	Pakistan	Sana Khan
4. Unnamed	Unnamed	Unnamed
5. ASA	Bangladesh	Md. Mustafa Kamal
6. BRAC	Bangladesh	Munshi Sulaiman
7. Grameen Koota, India		Frances Sinha
8. Prizma	Bosnia	Mark Schreiner

Microfinance Risk Management, L.L.C.

Pilot 1: CARD, Philippines

- n = 1,759
- Measured income directly as in natl. survey
- Direct measure gave 33% poor,
  versus 36% for scorecard

Notes: Accuracy was already tested, so no need to test again. Instead, pilot tests acceptance of poverty scoring by organization and its people. Also, most comparisons elsewhere compare against different poverty lines and so do not really test scorecard accuracy

Microfinance Risk Management, L.L.C.

Pilot 2: NWFT in Philippines

- **n = 20,000**
- **Applied scorecard as of today**
- **Applied retrospectively as new client**
- **Results:**
  - **Lower poverty scores associated with better repayment performance**
  - **Lower poverty scores when new associated with larger improvements later**
  - **Higher scores associated with larger falls**

Notes: Ignores drop-outs, and causality uncertain.

Microfinance Risk Management, L.L.C.

Pilot 3: NRSP in Pakistan

- n = 250 in 4 regions

- Report scores, not poverty rates

- Compared scores w/'participatory wealth ranking'

- Hid scorecard points from field staff

- Many adjustments to indicators (but had to match national survey)

- As elsewhere, found quick and easy in field

"In the absence of anything better,
it is adequate for its purposes"

Pilot 4: Unnamed

- n = 2,400 in 5 branches

- 46% < $1/day

- Crossed poverty likelihood w/other indicators to find "how", "why", and policy levers

- Crossed poverty likelihood w/loan cycle:
  - — 49% of new borrowers < $1/day
  - — After 6 loans, 42% < $1/day
  - — Ignoring drop-outs, 1 in 50 poor people crosses $1/day per loan cycle
  - — Causality?

Microfinance Risk Management, L.L.C.
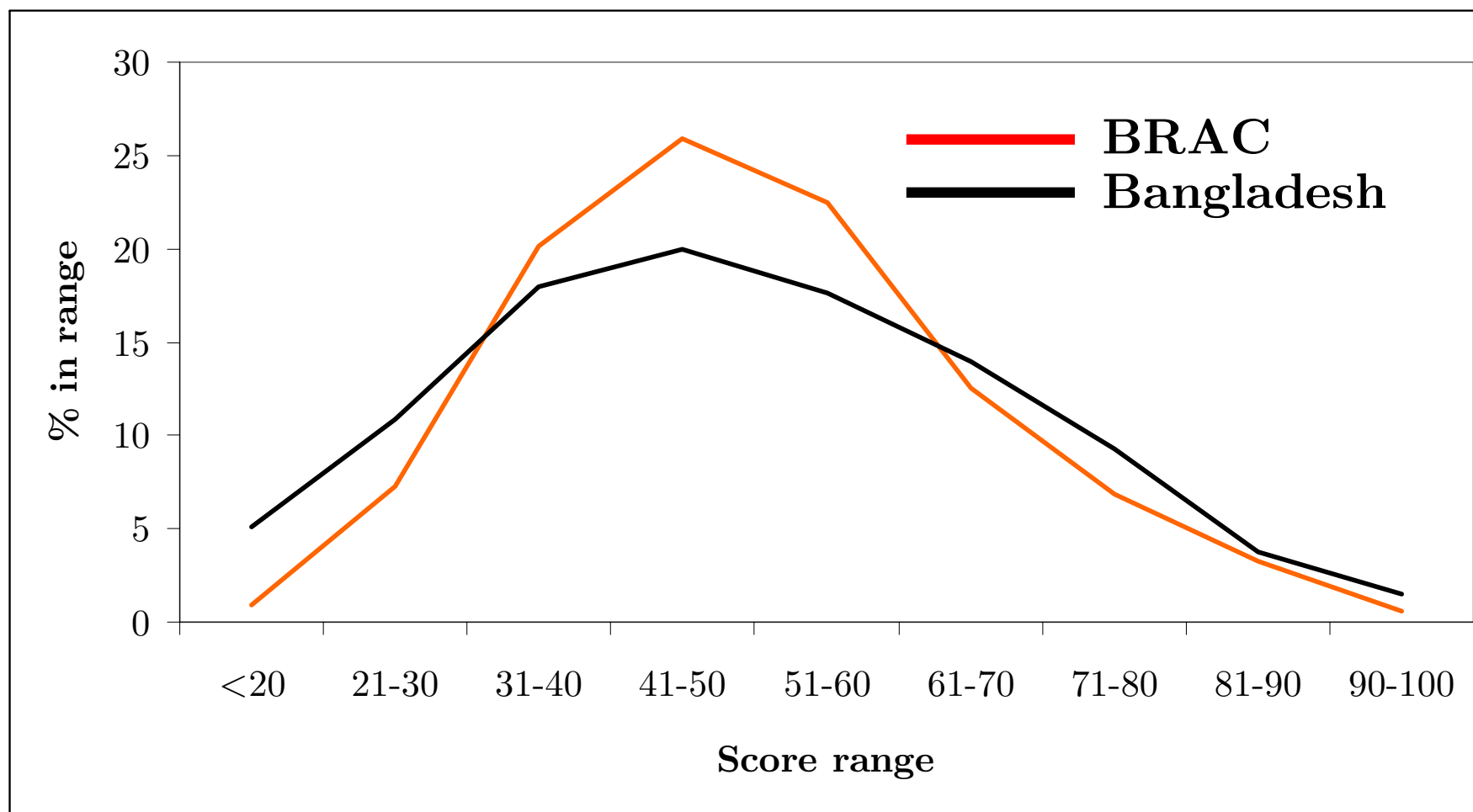
Pilot 5: ASA in Bangladesh

- **n = 113 in 40 of 64 districts, testing:**
  - — **Ease-of-use**
  - — **Acceptance by field staff**
  - — **61.7% below $1/day**

- **Will apply to random sample of 30–50% of new members from now on, plus follow-up**

- **Will track on paper in branches**

- **Commits despite some confusion:**
  - — **Reports scores, not poverty likelihoods**
  - — **Wants a cut-off below which all are poor**
  - — **Tested accuracy against different poverty line**

Microfinance Risk Management, L.L.C.

Pilot 6: BRAC in Bangladesh

- n = 1,600, 40 districts

- Will roll-out on sample of 3.9 million "DABI" clients

- 31.6% < $1/day

- Concerned about sensitivity for measuring changes in short periods such as 1 year

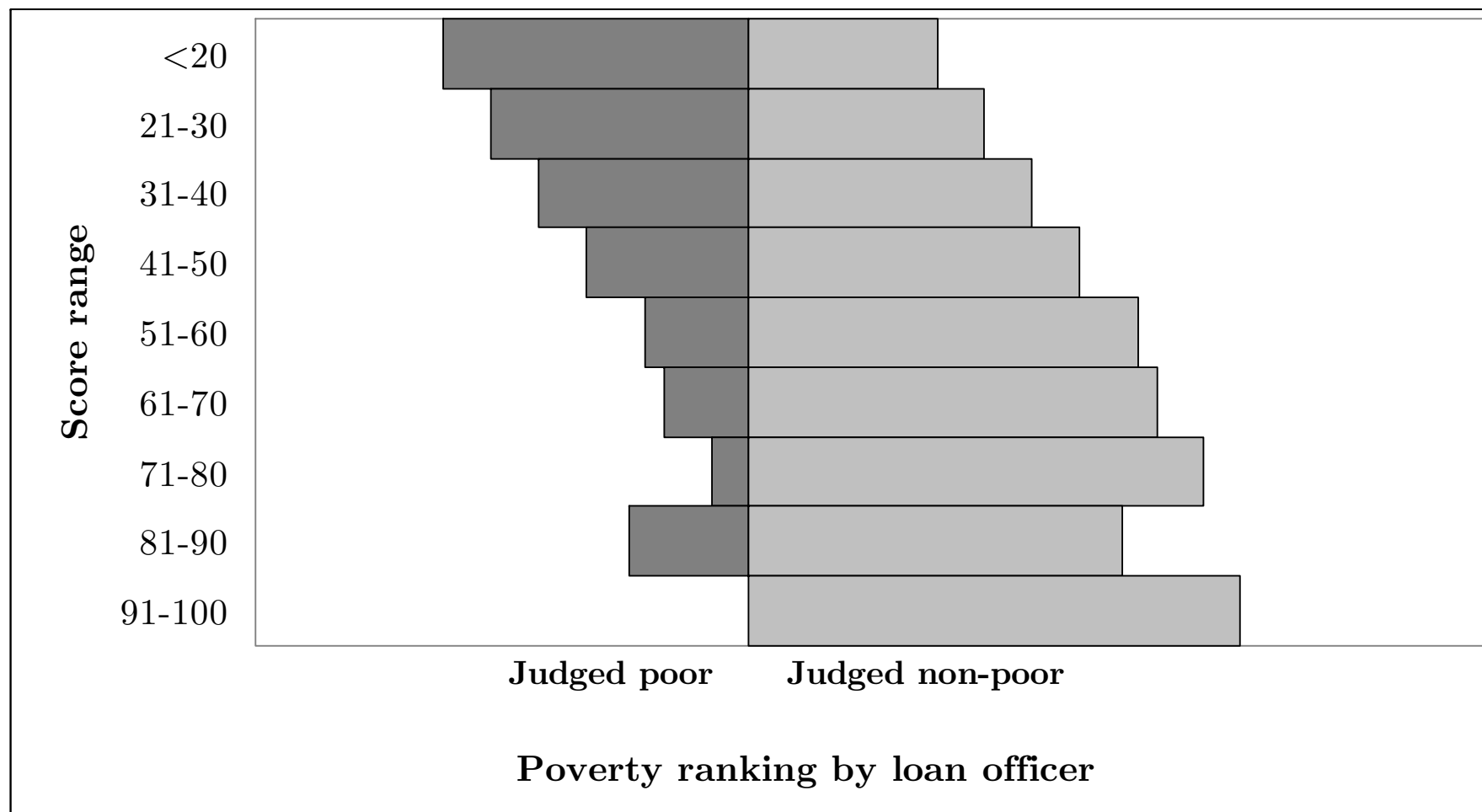Microfinance Risk Management, L.L.C.

Pilot 6: BRAC in Bangladesh (cont.)

Compared with overall population, BRAC clients are more likely to have "middle" or "high" scores

Microfinance Risk Management, L.L.C.

Pilot 6: BRAC in Bangladesh (cont.)

Compared scoring's poverty likelihood with loan officer's judgment (a different poverty line)

Score range: <20, 21-30, 31-40, 41-50, 51-60, 61-70, 71-80, 81-90, 91-100

Judged poor   Judged non-poor

Poverty ranking by loan officer

Microfinance Risk Management, L.L.C.

Pilot 7: Grameen Koota in India

- **n = 1,190**

- **33% < $1/day (lower than expected)**

- **Main obstacle: "Lack of belief in the importance and effectives of poverty scoring"**

- **Poverty likelihoods well-aligned with more complex and costly poverty assessment**

- **Led to recommendations for:**
  - **Easy-to-use software**
  - **Reform data collection and storage**
  - **Training so managers understand, then trust**

Pilot 8: Prizma, Bosnia-Herzegovina

- **7,000 clients with 21,000 loans**

- **Integrated in MIS, along with scorecards for:**
  - **Credit risk (most-poor have lowest credit risk)**
  - **Drop-out risk (least-poor have highest drop-out risk)**

- **13.5% new clients < national poverty line**
  - **Low rates surprises managers and sparks changes**
  - **Group borrowers less poor than individual**

- **Large variation in poverty rates within lender:**
  - **2x between branches**
  - **8x between loan officers**

- **Managing for depth of outreach:**
  - **Poverty rate affects loan officer bonus**
  - **On-going internal audit of data integrity**

Pilot 8: Prizma, BiH (cont.)

For clients w/multiple loans, poverty rate falls 0.7 percentage points per loan (Drop-outs? Causality?)

Previous loans	Cases	Poverty rate
0	7004	13.5%
1	4987	12.5%
2	3170	13.0%
3	2401	12.7%
4	1701	12.8%
5	1084	11.9%
6	619	9.8%
7	287	8.5%
8	82	9.4%
9 or more	32	11.6%
Total:	21367	13.5%

Ignoring drop-outs, 1 in 20 poor borrowers crosses poverty line per loan cycle

Microfinance Risk Management, L.L.C.

Are Scorecards Accurate Enough?

No scorecard is perfect (or even close). But poverty is relatively easy to predict, and even simple scorecards are almost as accurate as complex ones ('flat max').

Two aspects of accuracy:
1. Concentrate poor in low scores for targeting
2. Estimated likelihoods and rates match true ones

Accuracy is measured correctly, w/no reinvention:
— Tested on data not used to make scorecard
— 'Bootstrap' confidence intervals (standard stats.)
— Targeting accuracy at different cut-offs

Accuracy is almost as high as alternatives, and certainly 'good enough for government work'

Weaknesses of poverty scoring

- **Requires 'recent' expenditure data:**
  - — Unknown loss of accuracy as time passes
  - — Only government or huge donors can fund natl. surveys
  - — Indicators, responses must match national survey

- **Uses objective, quantitative poverty lines:**
  - — No 'contextualisation' (works only on average)
  - — $1/day, $2/day, and national lines are far lower than most local common-sense definitions of 'poor'

- **Implementation still has some costs:**
  - — Must monitor data quality
  - — Must learn to analyze data, figure out how to use

- **'It Pays To Be Ignorant' (Lant Pritchett):**
  - — Makes mistargeting errors explicit
  - — Depth of outreach often less than expected

Microfinance Risk Management, L.L.C.

What countries (will) have scorecards?

Grameen Fnd./CGAP/Ford 'PPI'				IRIS/USAID 'PAT'	
Done (w/docs.)	Built (w/o docs.)	Planned		Done	Planned
Bangladesh	Cambodia	Angola	Jordan	Albania	Azerbaijan
Bolivia	El Salvador	Armenia	Kenya	Bangladesh	Cambodia
Bosnia	Ethiopia	Benin	Namibia	Colombia	East Timor
Haiti	Guatemala	Cambodia	Romania	Guatemala	Lebanon
India	Honduras	Cameroon	Rwanda	Ghana	Montenegro
Mali	Malawi	China	Sri Lanka	India (2 states)	Serbia
Mexico	Nepal	Colombia	Tanzania	Indonesia	Tanzania
Morocco	Nicaragua	Dom. Rep.	Tunisia	Jamaica	
Pakistan	Nigeria	Egypt	Uganda	Kazakhstan	
Peru	Palestine	Ethiopia	Yemen	Madagascar	
Philippines	South Africa	Ghana	Zambia	Peru	
	Vietnam	Honduras		Tajikistan	
		Indonesia		Uganda	
				Vietnam	

Microfinance Risk Management, L.L.C.

How to get a scorecard for Country X

- **Search web!** 100s exist, but:
  — Academic (opaque, complex, unknown accuracy, scorecard often left out of paper)
  — Few, if any, in use

- Show strong demand to **get on CGAP's list**

- **Do-it-yourself** (or pay for it, ≈ $10K/country)
  — Method is outlined in my documents
  — Requires recent national expenditure survey, and:
    - Questionnaire and codebook
    - Aggregate household expenditure
    - Survey weights
    - Poverty line(s)
    - Consumer price index

Compare: CASH-POR Housing Index

Indicator	Values			Points
1. Size of house?	Small	Medium	Big	
	0	2	4	
2. Structural condition?	Dilapidated	Average	Good	
	0	2	6	
3. Quality of walls?	Poor	Average	Good	
	0	2	6	
4. Quality of roof?	Thatch/leaves	Tin/Iron sheets	Permanent roof	
	0	2	6	
Source: "Overcoming the Obstancles of Identifying the Poorest Families", 2000, Simanowitz, Nkuna, and Kasim.				Total:

- **What does 'small' mean? 'Poor'? 'Dilapidated'?**
- **If score is 10, is the person below $1/day?**
- **Are all people with scores of 0 below $1/day?**
- **Are there many thatched roofs on brick walls?**
- **But common-sense, easy-to-use, & well-accepted**

Microfinance Risk Management, L.L.C.

Compare: CGAP PAT

What is it?: Survey 300 clients & non-clients in area, gather indicators and expenditure on clothes & shoes, model principal components, compare terciles of client scores v. non-clients

PAT appears weaker in many aspects (Rosenberg):
— Not based on $1/day or other poverty line
— Looks at relative poverty, not absolute
— Based special-purpose, local survey, and so uses less and non-national data
— Less easy for users to understand model
— Less easy to use on on-going basis
— One application for 1 org. in 1 place costs about as much as PPI for a whole country

BUT . . . PAT works where there is no or old data

Compare: IRIS Poverty Tool

What is it?: Build scorecard w/LSMS-type data to estimate expenditure (not probability poor). Label people 'poor' or not by comparing estimated expenditure to poverty line

IRIS Tools, PPIs are similar in most key ways:
— Both use LSMS-type expenditure data
  (IRIS sometimes uses smaller data sets)
— Both depend crucially on data quality
— Similar accuracy (IRIS probably somewhat better)
— Can be used for targeting (IRIS says not to,
  but its preferred measure of accuracy [BPAC]
  takes targeting accuracy into account)

They are so similar that USAID uses both.

Compare: 'PAT' vs. 'PPI'

1. Transparency (helps get management buy-in):
- — PPI **weights are public knowledge** (user can choose to omit from scorecards used in field)
- — PPI **formula simpler** (users can understand, no need for logarithms nor spreadsheets)
- — PPI **measures accuracy more completely**, in more standard ways (IRIS could do this too)
- — PPI recognizes **poverty labels are probabilistic**

2. Indicators:
PPI has somewhat fewer, simpler, more objective indicators, **improving data quality** but **reducing accuracy and sensitivity to changes** over time

3. Costs of creation and implementation?

Microfinance Risk Management, L.L.C.

Poverty Scoring Summary

- **Scorecards are simple, inexpensive, transparent, objective, and accurate**

- **They estimate likelihood that a person is poor:**
  1. **Use policy cut-offs for targeting**
  2. **Take average to get portfolio poverty rate**
  3. **Track over time for progress out of poverty**

- **'Practicality' and accuracy both matter:**
  — **One page, few indicators, simple weights**
  — **Field workers can compute scores on paper**

- **Valid for *anyone*, not just microfinance clients**

Microfinance Risk Management, L.L.C.

Scoring Fits Paris Declaration

- **Accountability:**
  - — **Politics, society, managers**
  - — **To whom does it pay to be ignorant?**

- **'Manage for results':**
  - — **Both local MFI managers and donors**
  - — **Achieving mission impact on poverty?**
  - — **Encourages consciousness and thus explicit, intentional management of mission**

- **Alignment:**
  - — **Customize to country or even individual org.**
  - — **Enables better local management**

- **Harmonization:**
  - — **Compare poverty outreach by MFIs, countries**
  - — **Outputs aggregate across different scorecards**

Microfinance Risk Management, L.L.C.

FOR TARGETING THE POOR, MEASURING POVERTY RATES, and TRACKING CHANGE, POVERTY SCORING IS SIMPLE, INEXPENSIVE, TRANSPARENT, OBJECTIVE, and ACCURATE.

Microfinance Risk Management, L.L.C.