Public Finance II: Targeting

14.740x: Foundations of Development Policy

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Introduction

- Redistribution and safety nets are common in developed countries, and becoming increasingly common in developing countries
- Examples from the US?
- Examples from developing countries?

Targeting

- Basic challenge of implementing these programs: lack of information about who is really poor.
- This is a problem everywhere.
  - In the US literature, the problem is typically framed that we observe income, not true earning ability.
  - Optimal taxes are set taking into account this asymmetric information (Mirrlees 1971, Saez 2001).
  - If we know more characteristics about individuals that predict poverty (e.g., widowhood), we can "tag" these individuals and assign them different tax schedules (Ackerlof 1978)
- But the problem is particularly severe in developing countries: we don't even observe income!
- So what can you do? Ideas?

Targeting

- Targeting options if income is not observable:
  - Proxy-means tests (more generalized version of "tagging")
  - Community-based targeting
  - Self-targeting

Proxy-Means Tests

- This is the main way individual targeting is done in most developing countries. (E.g, Progresa).
- Concept: can't target based on consumption directly, since you could easily lie on a survey
- Instead: do a survey where you collect data on assets (land, house, motorcycle, etc)
  - Assets capture permanent component of income
  - And they are hard to falsify on a survey
- Use survey data to estimate relationship between consumption and assets, and used predicted consumption for targeting
- Problems
  - R^2 much less than 1, so you don't get poverty exactly right (horizontal equity)
  - Corruption among surveyors
  - Costly: need to do a census

Community-Based

- Allow local community to identify poor households
- Idea: local community has much more information than central government
  - This is the premise behind informal insurance, microfinance, etc.
- Problem:
  - If you are using this information to target beneficiaries, this information may not get revealed. Instead, elites may capture the project.
  - Potential tradeoff: better local information vs. more elite capture

Comparing PMT and Community Approaches

Alatas, Banerjee, Hanna, Olken, and Tobias (2009): "How to Target The Poor: Evidence from a Field Experiment in Indonesia"

- Randomized experiment compares three targeting methods:
  - Proxy-means test
  - Community ranking
  - Hybrid: community ranking, followed by proxy-means test on bottom 50% (to prevent elite capture)
- Villages randomized to one of above treatments, used to give out real one-time $3 transfer
- Sub-treatments to tease out why community and PMT may differ
  - Elite capture: let elites run meetings or invite full community
  - Effort: randomize order of ranking and see if going first matters, start with identifying 10 poorest first
  - Preferences: vary time of meeting to encourage more women in some meetings
- How do you randomize these?
- Baseline survey measures true consumption, endline for satisfaction

Community treatment

Community treatment

Experimental design

TABLE 1—RANDOMIZATION DESIGN

Community/hybrid subtreatments			Main treatments		
			Community	Hybrid	PMT
Elite	10 poorest first	Day	24	23	
		Night	26	32	
	No 10 poorest first	Day	29	20	
		Night	29	34	
Whole community	10 poorest first	Day	29	28	
		Night	29	23	
	No 10 poorest first	Day	28	33	
		Night	20	24	
		Total	214	217	209

- How do you analyze this design?

Metrics

- First evalute targeting based on headcount:
  - $MISTARGET = 0$ if poor and didn't receive transfer or rich and did receive it, 0 otherwise
- Evaluate targeting results based on four metrics:
  - Consumption (u_g)
  - How households ranked each other on baseline survey (u_c)
  - How village head ranked households at baseline (u_e)
  - Self-assessment (u_s)
- Also evaluate impact on satisfaction and legitimacy (many different measures)

Specification

- For mistargeting:

$$MISTARGET_{vhk} = \alpha + \beta_1 COMMUNITY_{vhk} + \beta_2 HYBRID_{vhk} + \gamma_k + \varepsilon$$

- Rank-correlations:
  - Convert each metric to a rank-ordering within village
  - Each targeting treatment defines a rank-ordering within village
  - So for each village v, compute $RANKCORR_{vkw}$ as the correlation between the targeting outcome in village v and welfare metric w
- Then regress

$$RANKCORR_{vkw} = \alpha + \beta_1 COMMUNITY_{vk} + \beta_2 HYBRID_{vk} + \gamma_k + \varepsilon$$

Results on mistargeting (headcount)

TABLE 3—RESULTS OF DIFFERENT TARGETING METHODS ON ERROR RATE BASED ON CONSUMPTION

		By income status		By detailed income status				
Sample:	Full population (1)	Inclusion error (2)	Exclusion error (3)	Rich (4)	Middle income (5)	Near poor (6)	Very poor (7)	Per capita consumption of beneficiaries (8)
Community treatment	0.031*	0.046**	0.022	0.028	0.067**	0.49	−0.013	9.933
	(0.017)	(0.018)	(0.028)	(0.021)	(0.027)	(0.038)	(0.039)	(18.742)
Hybrid treatment	0.029*	0.037**	0.009	0.020	0.052**	0.031	−0.008	−1.155
	(0.016)	(0.017)	(0.027)	(0.020)	(0.025)	(0.037)	(0.037)	(19.302)
Observations	5,753	3,725	2,028	1,843	1,882	1,074	954	1,719
Mean in PMT treatment	0.30	0.18	0.52	0.13	0.23	0.55	0.48	366

Results on alternative welfare metrics

- Communities target worse based on consumption, but target better based on local welfare metrics

TABLE 9—ASSESSING TARGETING TREATMENTS USING ALTERNATIVE WELFARE METRICS

	Consumption (r_g) (1)	Community survey ranks (r_c) (2)	Subvillage head survey ranks(r_e) (3)	Self-assessment (r_s) (4)
Community treatment	−0.065**	0.246***	0.248***	0.102***
	(0.033)	(0.029)	(0.038)	(0.033)
Hybrid treatment	−0.067**	0.143***	0.128***	0.075**
	(0.033)	(0.029)	(0.038)	(0.033)
Observations	640	640	640	637
Mean in PMT treatment	0.451	0.506	0.456	0.343

Results on satisfaction and legitimacy

- All metrics of satisfaction are higher with community treatment

TABLE 6—SATISFACTION

Panel A. Household endline survey

	Is the method applied to determine the targeted households appropriate? (1 = worst, 4 = best) (1)	Are you satisfied with the targeting activities in this subvillage in general? (1 = worst, 4 = best) (2)	Are there any poor HH that should be added to the list? (0 = no, 1 = yes) (3)	Number of HH that should be added to list (4)	Number of HH that should be subtracted from list (5)	*p*-value from joint test (6)
Community treatment	0.161***	0.245***	−0.189***	−0.578***	−0.554***	< 0.001
	(0.056)	(0.049)	(0.040)	(0.158)	(0.112)	
Hybrid treatment	0.018	0.063	0.020	0.078	−0.171	0.762
	(0.055)	(0.049)	(0.042)	(0.188)	(0.129)	
Observations	1,089	1,214	1,435	1,435	1,435	
Mean in PMT treatment	3.243	3.042	0.568	1.458	0.968	

Summary

- Interpretation: community has different concept of welfare, and community targeting allows them to achieve it. Outcome matches local welfare function, hence higher satisfaction.
- Other results:
  - Elite capture: no elite capture
    - Elite connected households no more likely to get transfer
    - In fact, if anything reverse discrimination in community treatment
    - But might be different if more money were at stake
  - Information:
    - Communities have some information about that PMT does not
- Conclusions:
  - Suggests that tradeoff for community targeting is more about what welfare function you want to maximize
    - If your goal is to minimize poverty headcount, want to use PMT
    - If your goal is to maximize utility (ie.., $W = W(u_1, u_2, ..., u_n)$), then community approach may be better

Self-Targeting

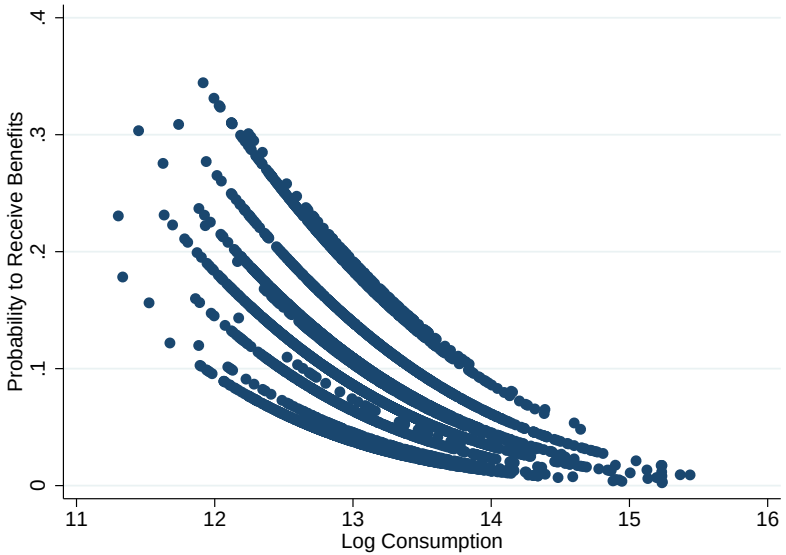
- Nichols and Zeckhauser (1982): "Ordeals" can be used to target the poor
  - Suppose you need to wait in long line to get unemployment benefits
  - Unemployed have low opportunity cost of time, so they are more likely to wait in line
  - Waiting in line therefore serves as a screening device
- Other examples?

Self-Targeting Theory

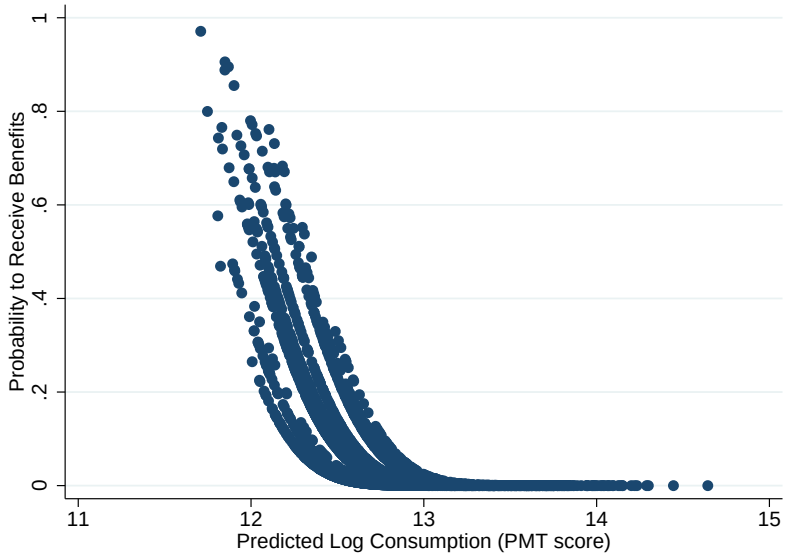
- Self-targeting context: you need to apply (wait in line, etc) in order to get screened
- This creates an additional complication: you don't know for sure if you will get the benefits
- Imagine your income is $y = y^o + y^u$, where y^o is the part the government can observe through PMT and y^u is the residual
- Define $\mu(y^o)$ to be the probability you pass the PMT as a function of observable income and $\lambda(y)$ to be the probability you pass the PMT as a function of your total income
- What do these look like in practice?

PMTs in practice

FIGURE 1. Probability of Obtaining Benefits vs. Log Per Capita Consumption and PMT score



(A) Probability of Obtaining Benefits vs. Log Per Capita Consumption



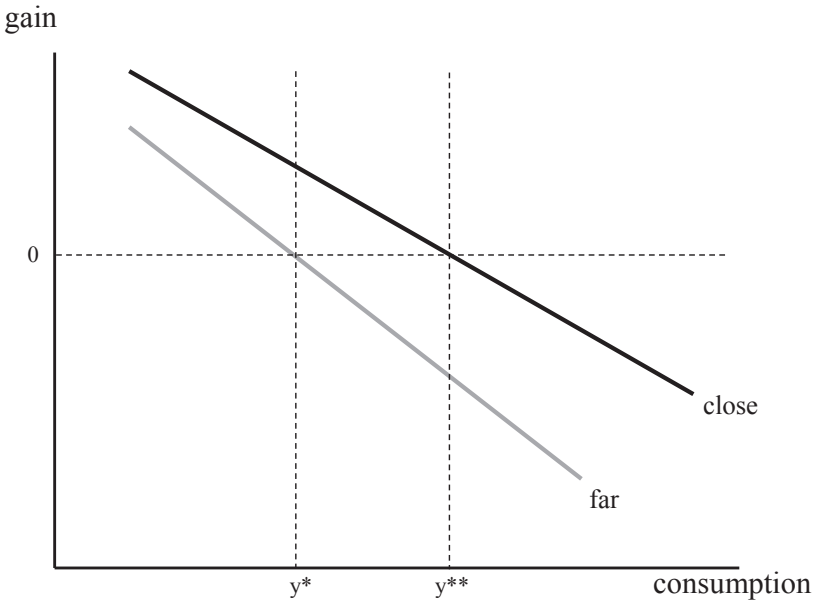
(B) Probability of Obtaining Benefits vs. PMT score

Self-targeting theory

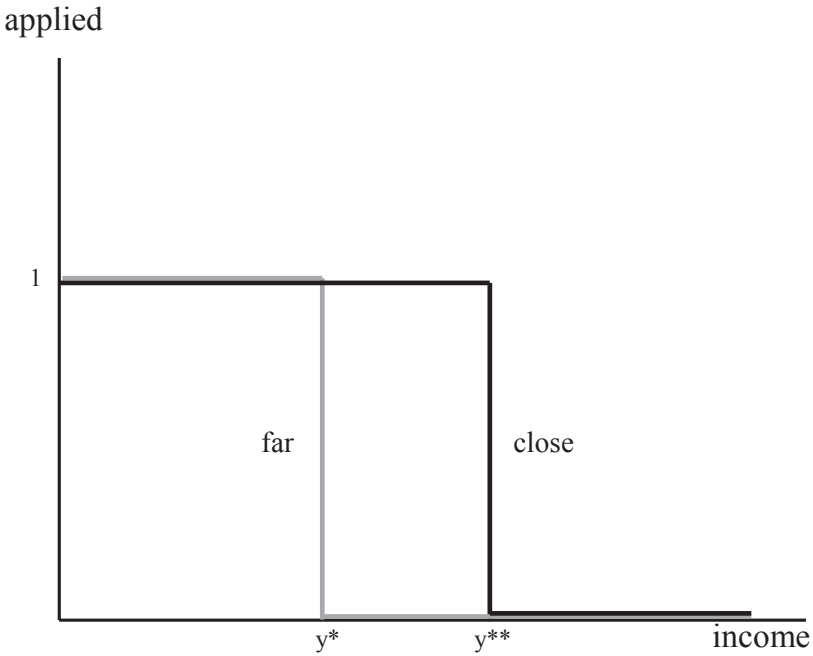
- When will someone apply? Suppose that person only knows y (they don't really understand what government can and can't observe).
- Define c as cost of applying and b as benefit
- They apply if
$$-c + \lambda(y)(b) > 0$$
- Suppose that only cost is time. Then cost is proportional to your wage So then $c = ty$.
- So apply if
$$-ty + \lambda(y)(b) > 0$$
- Two key drivers of targeting:
  - As I get richer, costs go up relative to benefits
  - As I get richer, expected chance I pass the test falls

Simple example with constant lambda

FIGURE 1. 1Illustration of utility gain with no errors



(A) Gain vs. consumption for close and far subtreatments



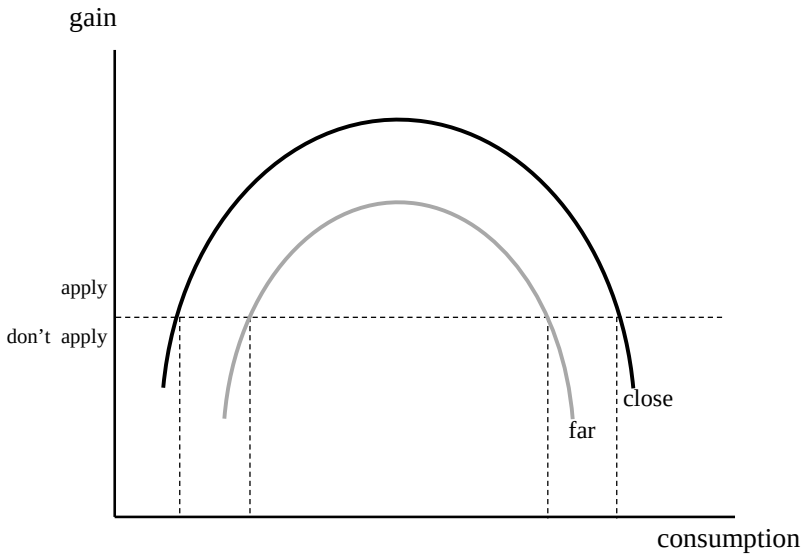
(B) Targeting improves as length of ordeal increases

Problems

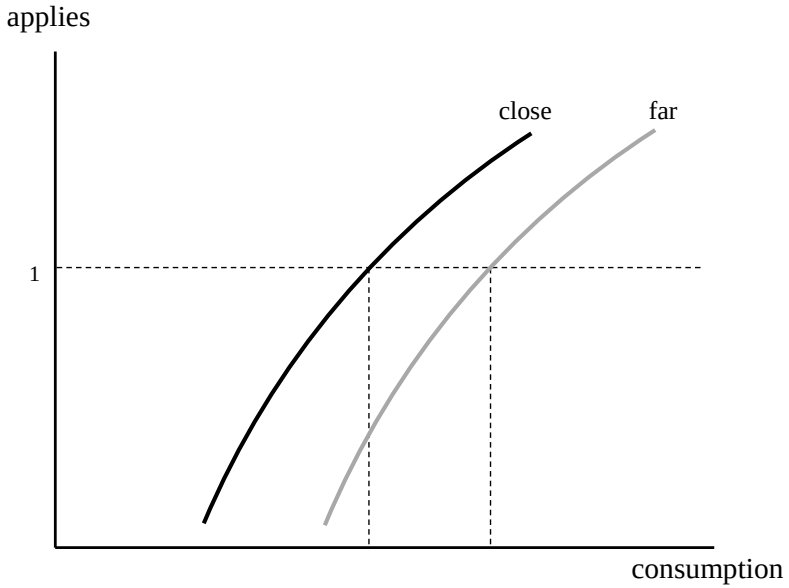
- Why might this not work in practice?

Differential utility

FIGURE 4. Illustration of utility gain with concave utility



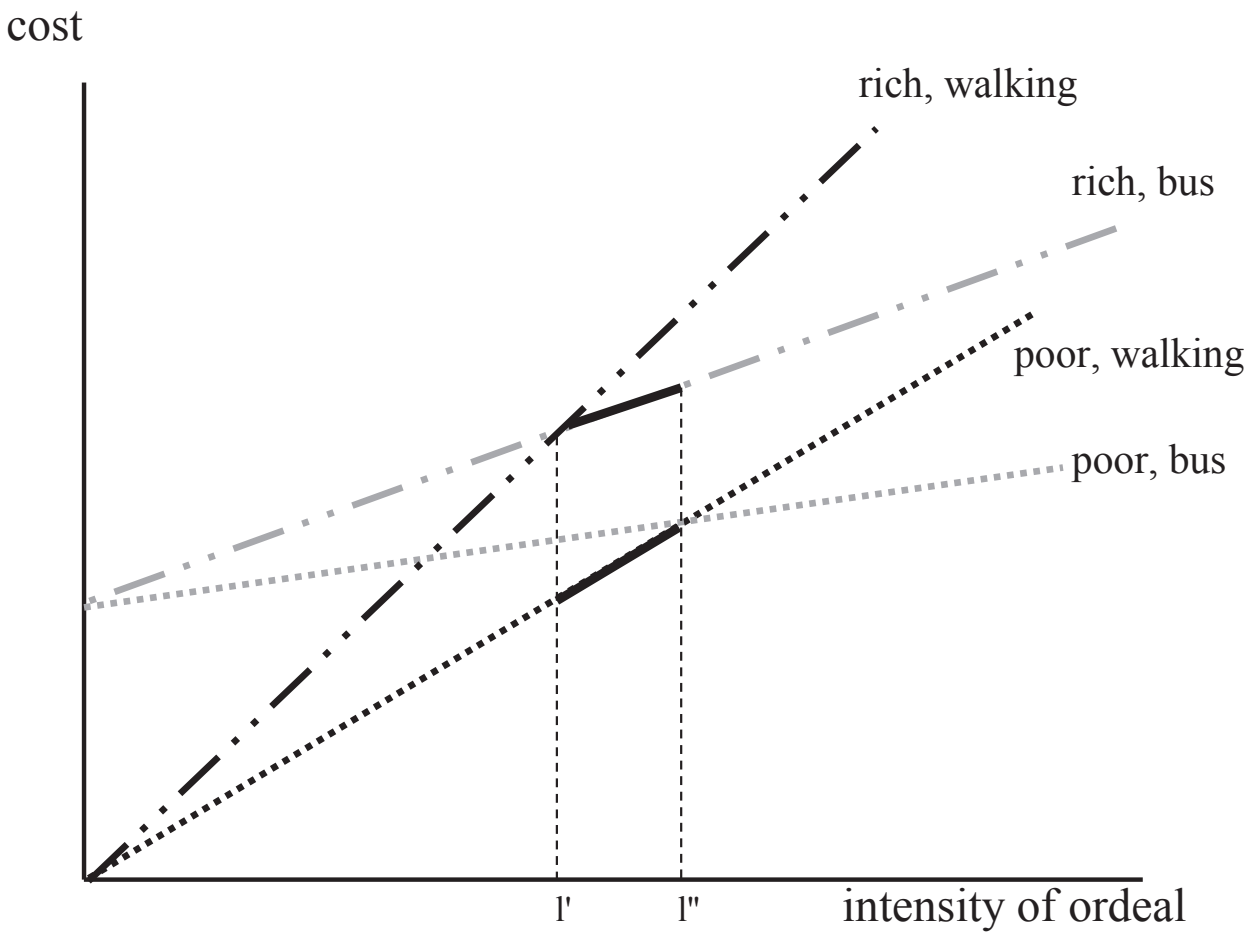
(A) Gain vs. consumption for close and far subtreatments



(B) Targeting can worsen as length of ordeal increases

Travel costs

FIGURE 3. Non-Linearities in Travel Costs



What happens in practice?

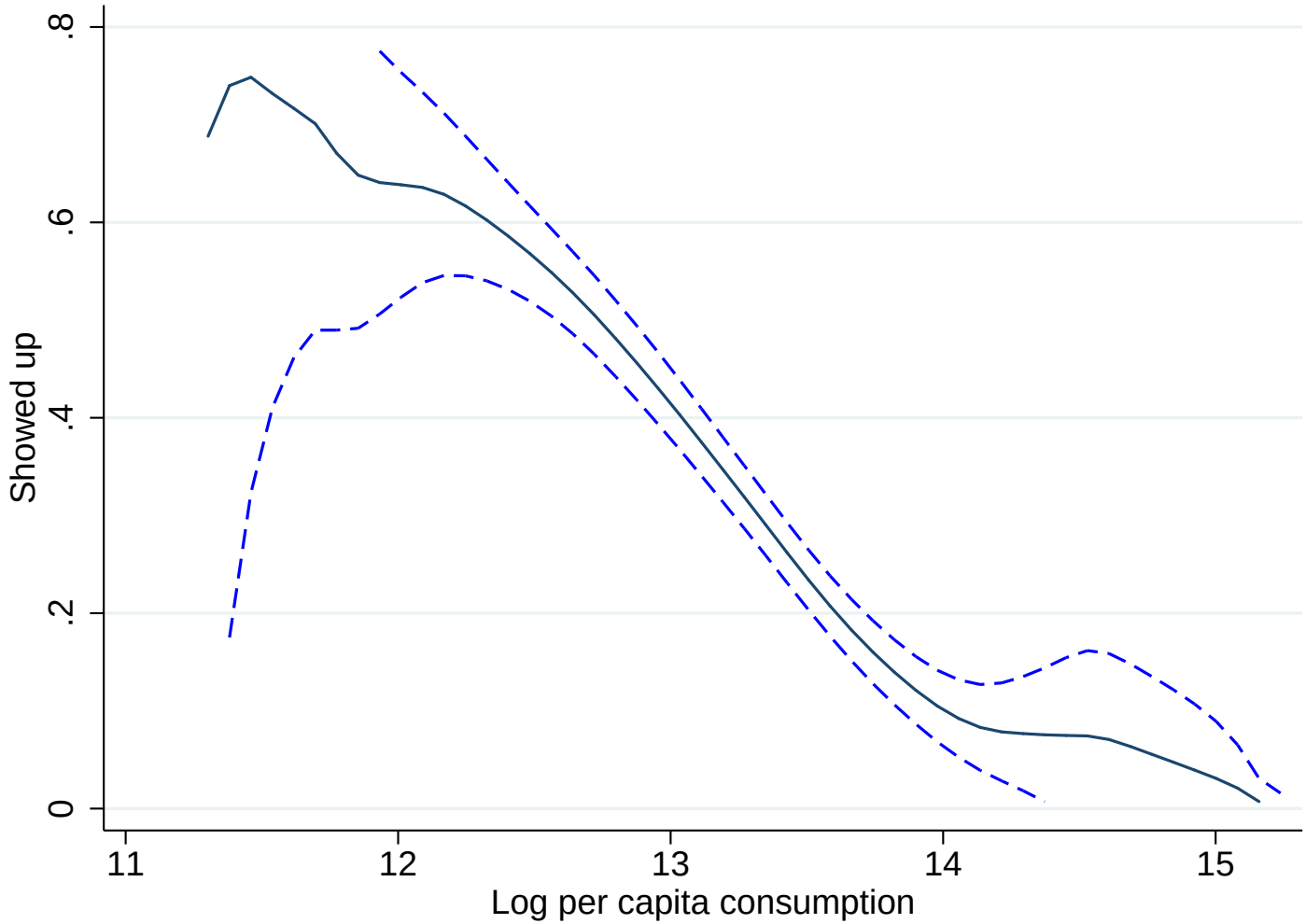
- Randomized experiment in Indonesia
  - 400 villages newly eligible for Indonesian conditoinal cash transfer program. Targeted to bottom 10% of HH based on PMT
  - Randomized into PMT (with some pre-screening done by villages) vs. self-targeting, where you had to go to central meeting place to apply for program
  - Measure true poverty based on baseline survey conducted before we start

Explaining the program

Application process

Who shows up

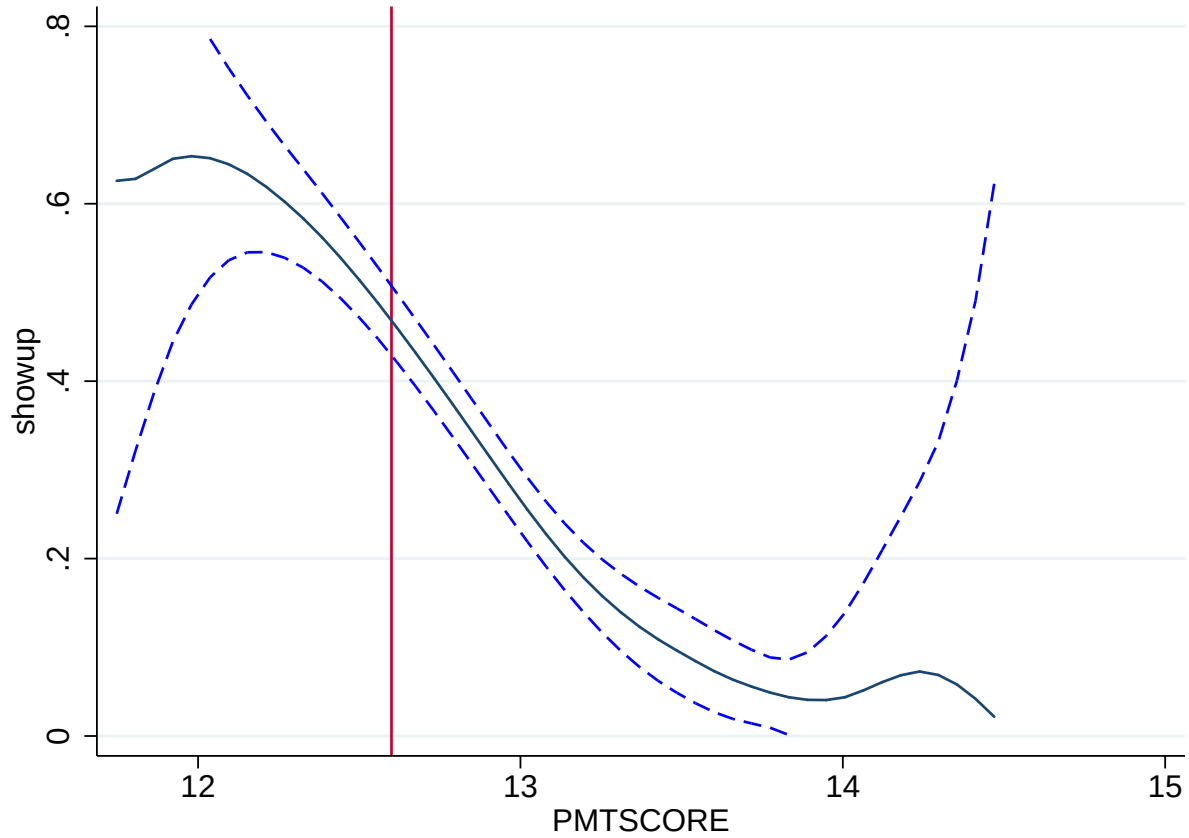
FIGURE 5. Showup Rates Versus Log Per Capita Consumption



- Aside: this is a Fan local regression. What is that?

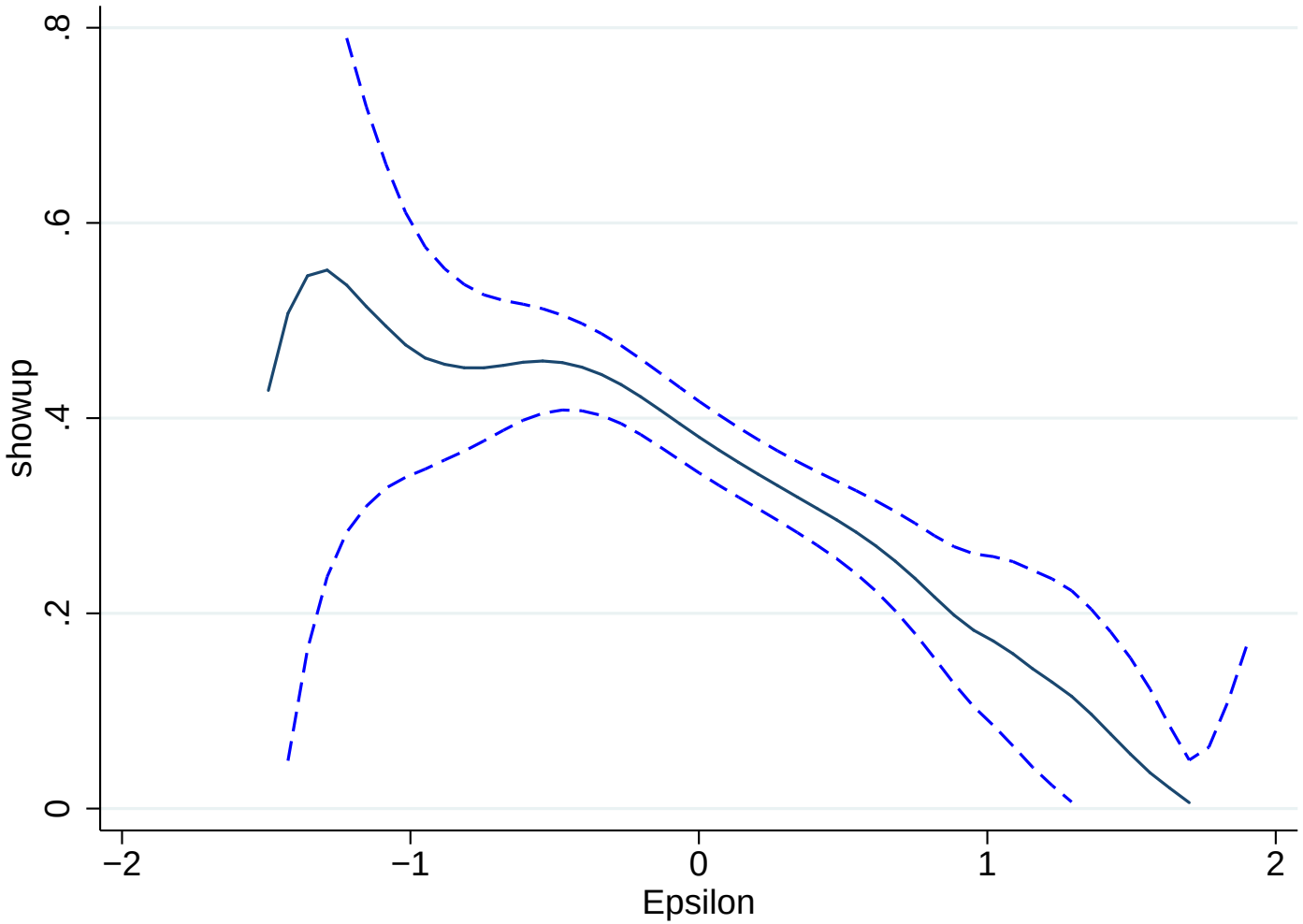
On observables...

FIGURE 6. Showup Rates Versus Observable and Unobservable Components of Log Per Capita Consumption



(A) Showup as a function of observable consumption ($X_i'\beta$)

And unobservables...

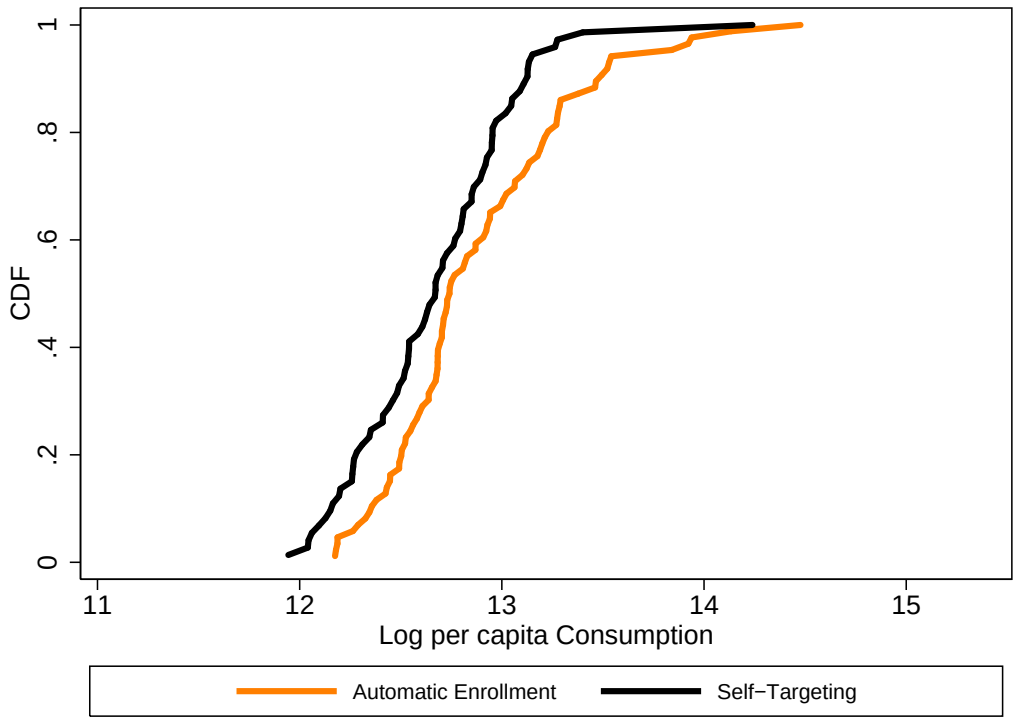


(B) Showup as a function of unobservable consumption (ε_i)[45]

Comparison to actual (pre-selected) PMT...

CDF

FIGURE 7. Experimental Comparison of Self Targeting and Automatic Enrollment Treatments

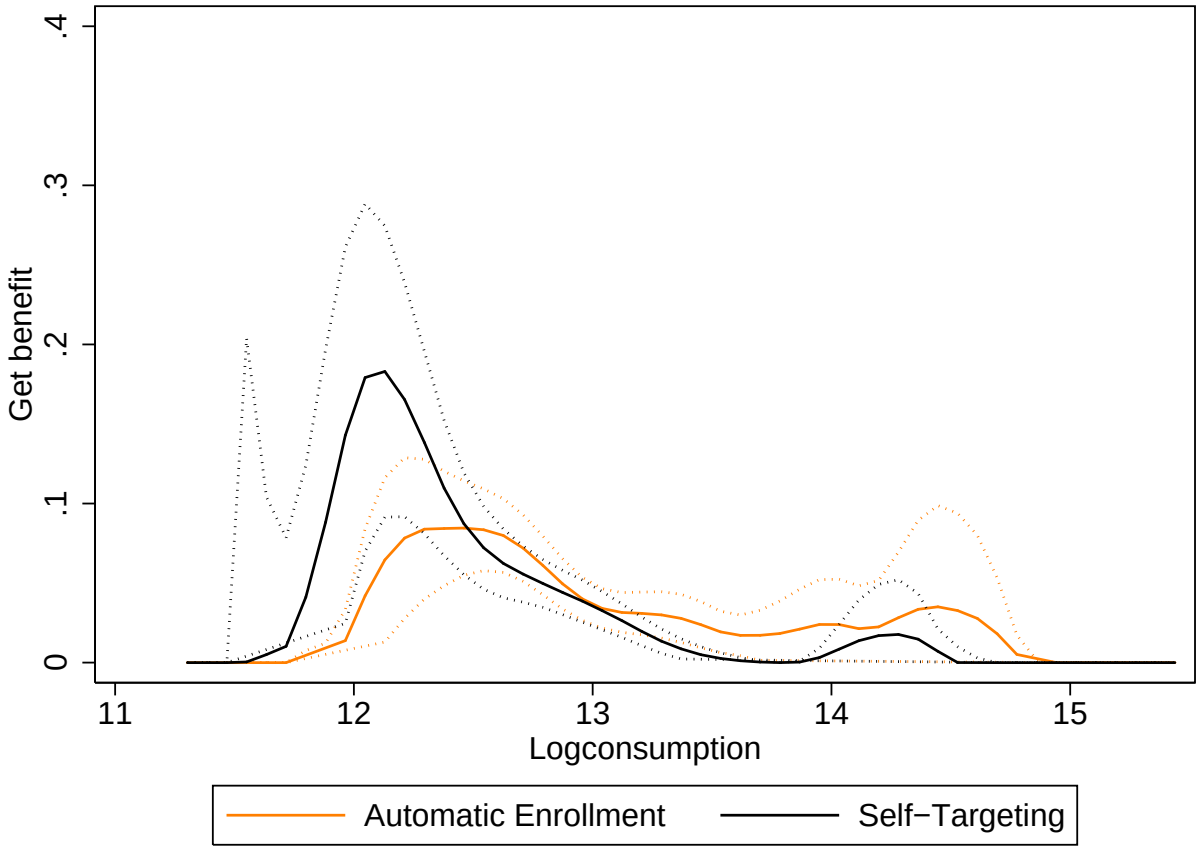


(A) CDF of log per capita consumption of beneficiaries

- CDF plots $\Pr(y < x)$. How do we read this?

Comparison to actual (pre-selected) PMT...

Probability of getting benefits



(B) Receiving benefit as a function of log per capita consumption

46

- Key result: the rich don't bother to apply

Concluding thoughts

- Common theme for taxation and redistribution: lack of information
  - True everywhere, but particularly true in developing countries
  - As a result, tax and redistribution policies look very different in developing countries

References

- Alatas, Banerjee, Hanna, Olken, Purnamasari, and Wai-Poi (2014). "Self Targeting: Evidence from a Field Experiment in Indonesia"
- Alatas, Banerjee, Hanna, Olken, and Tobias (2012). "Targeting the Poor: Evidence from a Field Experiment in Indonesia"
- Alatas, Banerjee, Hanna, Olken, Purnamasari, and Wai-Poi (2013). "Ordeal Mechanisms In Targeting: Theory and Evidence from a Field Experiment in Indonesia"