# Public Finance III: Transparency

## 14.740x: Foundations of Development Policy

Professor Ben Olken

# Program implementation

- Classic principal-agent-citizen problem
  - Central governments have a goal and design a program accordingly
  - But local officials who implement the programs may have incentives that run counter to that goal
- Today we'll talk about the role of transparency and program information. What is this?
- Specically, we study a food transfer program, where local officials:
  - Have leeway in implementation and it is hard for the central government to monitor them
  - Have more information about the program rules than the citizens
- We examine how providing more information to the citizens about program rules and eligibility can improve implementation of the program, potentially by improving their bargaining position vis-a-vis the officials

# Context

- We examine the Raskin program in Indonesia, which provides eligible households with 15kg per month of heavily subsidized rice
- Right now information about the program among citizens is low:
  - Only 30% of eligible households know that they are actually Raskin eligible, and beneficiaries believe the copay is 25% higher than it actually is
  - Eligible only receive 1/3 of intended subsidy
- Given low levels of information, officials may have an advantage in bargaining with villagers
- Question: Will program transparency increase the amount of subsidy eligible households receive?

# Project design

- Randomized trial in 572 villages working with the Indonesian government
- In 378 randomly chosen villages eligible households received Raskin identification cards, which informed them they were eligible and the amount of rice

# Sample card

KARTU RASKIN
SEPTEMBER 2012 - DESEMBER 2013
KABUPATEN BANDUNG

**Nama KRT:** Agus Budi
**Nama PKRT:** Siti Jasnah
**Nama ART:** Habib
**Alamat:** Gg. Markisa No.24
Kampung Ciwedi, Saketi

Tanda Tangan / Cap Jempol
Pemegang Kartu

Kartu ini harus diperlihatkan pada saat pengambilan raskin

**HAK PEMEGANG KARTU RASKIN:**

1. Pemegang kartu ini berhak untuk menerima beras Raskin sebanyak 15kg per RTS-PM per bulan selama bulan September 2012-Desember 2013
2. Harga tebus beras Raskin adalah Rp. 1.600 per kg di Titik Distribusi.

**KETENTUAN:**

1. Pembayaran Raskin dari RTS-PM kepada Pelaksana Distribusi Raskin dilakukan secara tunai
2. Kartu harus disimpan dengan baik, kehilangan atau kerusakan kartu menjadi tanggung jawab pemegang kartu
3. RTS-PM harus dapat menunjukkan kartu Raskin pada saat pengambilan beras.

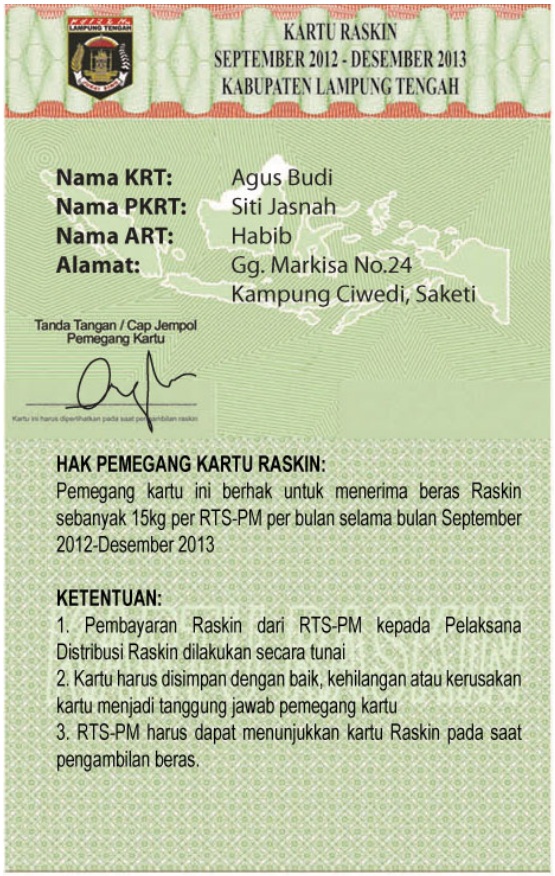
# Mechanisms

- Suppose the cards "worked". What else might you want to know?
- To elucidate mechanisms, within treatment villages varied 4 aspects of the card program
  - Public information about eligibility and cards (in addition to private information)
  - What information was printed on the cards (copay price or not)
  - Who received the cards (all eligible households or a subset) to test whether physical card matters
  - Whether cards contained clipoff coupons to examine perceived accountability effects

# Public vs. private information


- Public vs. private information. Designed to test whether common knowledge facilitates collective action.
  - Private information: village head gets list and one copy posted.
  - Public information: in addition, many copies of list and posters about cards posted

# Price vs. no-price


KARTU RASKIN
SEPTEMBER 2012 - DESEMBER 2013
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3. RTS-PM harus dapat menunjukkan kartu Raskin pada saat pengambilan beras.

- Price vs. no-price: Designed to test precisely whether varying information on cards matters
  - Varied whether cards contained information on co-pay price or not

# Who received cards

- In all villages, full list of eligible beneficiaries was distributed
- But, varied
  - Whether cards were sent to all eligibles
  - Cards only send to bottom 10% of the population (about poorest 1/3 of beneficiaries)
- Designed to test role of physical card in bargaining

# Coupons


- Coupons or no: Designed to test whether implied checking on the part of the government changed the results

# Experimental Design Issues - Matrix Design

- Within the 378 card villages, we want to run 4 different dimensions on 4 dimensions (so 16 possibilities):
  - Public vs. private information
  - Information on the cards
  - Who received cards
  - Tear-off coupons or no
- What's the best way of designing an experiment to maximize power
- We did this as a matrix design

# Matrix Design

| | | Public | | Private | |
|---|---|---|---|---|---|
| | | Price | No price | Price | No price |
| Cards to All | Coupons | | | | |
| | No Coupons | | | | |
| Cards to B10 | Coupons | | | | |
| | No Coupons | | | | |

# Matrix Design

- What are the tradeoffs of a matrix design? When does it make sense
- If you assume no interactions, then you can analyze it like this (let's ignore price and B10 for now):

$$y_i = \alpha + \beta_1 CARD_i + \beta_2 PUBLIC_i + \beta_3 COUPON_i + \epsilon_i$$

- How to interpret $\beta_2$? Power?
- Suppose instead you did it with interactions. (ignore price and b10)

$$\begin{aligned} y_i = & \alpha + \beta_1 CARD_i + \beta_2 PUBLIC_i + \beta_3 COUPON_i \\ & + \beta_4 PUBLIC_i \times COUPON_i + \epsilon_i \end{aligned}$$

- How does interpretation of $\beta_2$ change?

# Data

- Data comes from three follow-up surveys:
  - Conducted 2 months, 8 months, and 18 months after cards distributed
  - Oversampled beneficiaries
  - Also interviewed the village leader
- Administrative data on eligibility status
- Baseline consumption data from the previous experiment

# Empirical analysis

- Estimation of main effect of cards is straightforward:

$$y_{ivs} = \beta_0 + \beta_1 CARDS_{vs} + \alpha_s + \epsilon_{ivs}$$

- How do you interpret $\beta_1$ given the matrix design?
- $\alpha_s$ are stratum fixed effects. What do these do?
- Notes:
  - All estimates are intent-to-treat (i.e. impact of being in a village randomized to receive cards). What is this?
  - Estimate separately for those eligible for program and those not eligible
  - Cluster standard errors by village. What is this?

# Impact on card receipt and use

**Table 2: Reduced Form Effect of Card Treatment on Receipt and Use**

| | Eligible Households | | | Ineligible Households | | |
|---|---|---|---|---|---|---|
| | Received Card | Used Card | Correctly idenfities own status | Received Card | Used Card | Correctly idenfities own status |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Card | 0.28*** | 0.14*** | 0.09*** | 0.02** | 0.03** | 0.04* |
| Treatment | (0.02) | (0.02) | (0.02) | (0.01) | (0.01) | (0.02) |
| Observations | 5,693 | 5,693 | 5,691 | 3,619 | 3,619 | 3,619 |
| Control Mean | 0.06 | 0.06 | 0.30 | 0.05 | 0.05 | 0.35 |

- Note that only 28% of eligibles received card.

# Impact on subsidy received

Table 3: Effect of Card Treatment on Rice Purchases and Price

| | Eligible Households | | | | Ineligible Households | | | |
|---|---|---|---|---|---|---|---|---|
| | Bought in the Last 2 Months | Amount Purchased (Kg) | Price (Rp.) | Subsidy (Rp.) | Bought in the Last 2 Months | Amount Purchased (Kg) | Price (Rp.) | Subsidy (Rp.) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Card Treatment | 0.02 | 1.18*** | -60*** | 7,023*** | -0.06*** | 0.06 | -38* | 512 |
| | (0.02) | (0.24) | (18) | (1,361) | (0.02) | (0.19) | (23) | (1,042) |
| Observations | 5,693 | 5,692 | 4,881 | 5,692 | 3,619 | 3,619 | 2,283 | 3,619 |
| Control Group Mean | 0.79 | 5.29 | 2,276 | 28,605 | 0.63 | 3.46 | 2,251 | 18,754 |

- Recall only 28 pp impact on receiving a card. If you believed only effect was through receiving card, what would Wald estimate be?
- Is this valid?

# Does this help the poor or not?

- The cards increased receipt by eligibles, who were targeted. But was this at the expense of poor ineligibles?
- To investigate this we use per-capita consumption from a baseline survey and estimate:

$$\begin{aligned} y_{kvist} &= \alpha_k + \alpha_{st} + \beta TREAT_v + \omega LNPCE_i + \\ &\quad + \gamma TREAT_v \times LNPCE_i + \epsilon_{kvist} \end{aligned}$$

- This is again an interaction specification. What does $\gamma$ tell us? What do we learn from $\beta + \gamma$?

# Does this help the poor or not?

| | Eligible Households | | | | Ineligible Households | | | |
|---|---|---|---|---|---|---|---|---|
| | Bought in the Last 2 Months | Amount Purchased (Kg) | Price (Rp.) | Subsidy (Rp.) | Bought in the Last 2 Months | Amount Purchased (Kg) | Price (Rp.) | Subsidy (Rp.) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Card Treatment | -0.01 | 0.68** | -69** | 4,074** | -0.09*** | -0.01 | -60* | 119 |
| | (0.03) | (0.31) | (28) | (1,659) | (0.03) | (0.18) | (33) | (963) |
| Log Consumption | -0.00 | 0.11 | -11 | 574 | -0.12*** | -0.66*** | -19 | -3,496*** |
| | (0.02) | (0.21) | (19) | (1,115) | (0.02) | (0.11) | (20) | (597) |
| Treatment x Log Consumption | -0.01 | -0.23 | 22 | -1,446 | 0.03 | 0.06 | 35 | 288 |
| | (0.02) | (0.30) | (24) | (1,591) | (0.02) | (0.14) | (25) | (740) |
| Observations | 1,266 | 1,266 | 1,148 | 1,266 | 1,925 | 1,925 | 1,235 | 1,925 |
| Control Group | 0.82 | 5.09 | 2,313 | 26,653 | 0.62 | 2.99 | 2,305 | 15,663 |

# Discussion

- Results suggest cards had a substantial impact
  - Increase in subsidy for eligibles of 25%
  - And this is with only 28 pp increase in cards. With full penetration of cards, could have been higher
  - Cost effective: increase in subsidy is well over 5 times the cost of the cards over the period of the study.
- Investigate mechanisms:
  - Kinds of information
    - Providing public vs. private information
    - Providing more information on the cards about the program
    - Providing physical cards with the information
  - Testing accountability effects through coupons

# Public Information

- Public information
  - Cards provide individual information on one's eligibility status.
  - But, if I am thinking of protesting, I may need to know if others would join me if I protested.
  - Likewise, village heads need to know that everyone knows that everyone else knows
  - And so on. This is called common knowledge (Chwe 2001).
- To test this we varied the information about the program:
  - Standard information: List sent to village head and one poster with beneficiary lists posted
  - Public information: We posted posters for both the full listing and cards throughout in the villages (3 posters per hamlet) and mosque radio announcements
- We test whether this indeed changed people's beliefs, and whether it in turn affected outcomes
- NB: ends up not being a pure test of common knowledge since it affects both first-order and higher-order beliefs

# Knowledge and beliefs

Table 7: Effect of Public Information on Seeing the Eligibility List

| | Eligible (1) | Ineligible (2) | Village officials (3) | Informal Leaders (4) |
|---|---|---|---|---|
| *Panel A: Respondent has seen the list* | | | | |
| Public Info | 0.14*** | 0.10*** | 0.20*** | 0.14** |
| | (0.02) | (0.02) | (0.06) | (0.05) |
| Standard Info | 0.02 | 0.01 | 0.03 | 0.02 |
| | (0.01) | (0.01) | (0.06) | (0.05) |
| *Difference:* | | | | |
| Public - Standard | 0.11*** | 0.10*** | 0.17*** | 0.12** |
| | (0.02) | (0.02) | (0.06) | (0.05) |
| Observations | 5,685 | 3,619 | 496 | 385 |
| Control Mean | 0.07 | 0.06 | 0.36 | 0.12 |
| *Panel B: Respondent believes that stated category of individuals has seen the list* | | | | |
| Public Info | 0.35*** | 0.26*** | 0.24*** | 0.24*** |
| | (0.04) | (0.03) | (0.05) | (0.05) |
| Standard Info | 0.07 | 0.01 | 0.03 | 0.06 |
| | (0.04) | (0.03) | (0.05) | (0.04) |
| *Difference:* | | | | |
| Public - Standard | 0.28*** | 0.25*** | 0.22*** | 0.18*** |
| | (0.05) | (0.04) | (0.06) | (0.05) |
| Observations | 9,304 | 9,304 | 9,304 | 9,304 |
| Control Mean | 0.31 | 0.15 | 1.04 | 0.47 |

# Impacts

Table 9B: Effect of Public Information on Rice Purchases and Price

| | Eligible Households | | | | Ineligible Households | | | |
|---|---|---|---|---|---|---|---|---|
| | Bought in the Last 2 Months | Amount Purchased (Kg) | Price (Rp.) | Subsidy (Rp.) | Bought in the Last 2 Months | Amount Purchased (Kg) | Price (Rp.) | Subsidy (Rp.) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Public Info | 0.03 | 1.54*** | -79*** | 9,081*** | -0.07*** | 0.09 | -50* | 657 |
| | (0.02) | (0.30) | (21) | (1,665) | (0.03) | (0.23) | (27) | (1,256) |
| Standard Info | 0.01 | 0.79*** | -41* | 4,778*** | -0.04 | 0.07 | -26 | 527 |
| | (0.02) | (0.30) | (22) | (1,690) | (0.03) | (0.22) | (25) | (1,222) |
| *Difference:* Public - Standard | 0.01 | 0.75** | -38* | 4,303** | -0.03 | 0.03 | -24 | 129 |
| | (0.02) | (0.36) | (22) | (1,999) | (0.03) | (0.25) | (25) | (1,338) |
| Observations | 5,685 | 5,684 | 4,873 | 5,684 | 3,619 | 3,619 | 2,283 | 3,619 |
| Control Mean | 0.79 | 5.29 | 2,276 | 28,605 | 0.63 | 3.46 | 2,251 | 18,754 |

- Public information doubles impact of cards

# But card use also goes up

**Table 10A: Effect of Public Info on Card Receipt and Use**

| | Eligible Households | | Ineligible Households | |
|---|---|---|---|---|
| | Received Card | Used Card | Received Card | Used Card |
| | (1) | (2) | (3) | (4) |
| Public Info | 0.31*** | 0.16*** | 0.02 | 0.03 |
| | (0.02) | (0.02) | (0.01) | (0.02) |
| Standard Info | 0.25*** | 0.11*** | 0.03** | 0.04** |
| | (0.03) | (0.02) | (0.01) | (0.02) |
| Public - Standard | 0.06* | 0.05* | -0.01 | -0.01 |
| | (0.03) | (0.03) | (0.02) | (0.02) |
| Observations | 5,685 | 5,685 | 3,619 | 3,619 |
| Control Mean | 0.06 | 0.06 | 0.05 | 0.05 |

# Discussion

- So public information doubles increase of subsidy
- But part of the impact is that cards more likely to be distributed by 6 pp (compared to 25 pp in standard information)
- So could only impact of public information be because more cards were handed out?
- No:
  - If you compute the Wald effect of subsidy on receiving a card, it is Rp. 17,000 in standard and Rp. 31,000 in enhanced
  - Suggests it is not just about cards per se
  - Suggests a pure role for information

# Information about prices


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- Changing the information on the cards is the cleanest test of information
- Everything held constant except we added a single extra line to the cards with co-pay price information

# Impacts of price information

Table 11B: Effect of Printing Price on Cards on Rice Purchases and Price

| | Eligible Households | | | | Ineligible Households | | | |
|---|---|---|---|---|---|---|---|---|
| | Bought in the Last 2 Months | Amount Purchased (Kg) | Price (Rp.) | Subsidy (Rp.) | Bought in the Last 2 Months | Amount Purchased (Kg) | Price (Rp.) | Subsidy (Rp.) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Cards with Price | 0.01 | 1.13*** | -55** | 6,708*** | -0.04 | 0.12 | -37 | 881 |
| | (0.02) | (0.36) | (25) | (2,056) | (0.03) | (0.26) | (29) | (1,415) |
| Cards without Price | 0.01 | 0.46 | -34 | 2,935 | -0.04 | 0.08 | -7 | 451 |
| | (0.02) | (0.32) | (24) | (1,797) | (0.03) | (0.25) | (27) | (1,349) |
| *Difference:* Price - No Price | 0.00 | 0.67* | -21 | 3,773* | -0.01 | 0.03 | -31 | 430 |
| | (0.02) | (0.36) | (25) | (2,031) | (0.03) | (0.24) | (25) | (1,279) |
| Observations | 5,688 | 5,687 | 4,877 | 5,687 | 3,615 | 3,615 | 2,281 | 3,615 |
| Control Group Mean | 0.79 | 5.29 | 2,276 | 28,605 | 0.63 | 3.46 | 2,251 | 18,754 |

# Receipt of cards

- In all card villages, village heads received a letter with the complete list of eligible households, and all lists that were posted publicly had the complete list
- But, the government varied who received the cards
  - In half of villages, cards were mailed to all beneficiaries
  - In the other half of village, cards were mailed only to the bottom 10% of all households (about bottom 1/3 of beneficiaries)
- We can analyze our data separately for these three groups of households – eligible bottom 10, eligible non-bottom 10, and ineligible
- This isolates the role of getting a card per se

# Who receives cards

| | Subsidy received by…. | | |
|---|---|---|---|
| | Bottom 10 households | Other eligible households | Ineligible households |
| | (1) | (2) | (3) |
| Cards to Bottom 10 | 4,662** | 1,624 | 691 |
| | (1,911) | (1,783) | (1,338) |
| Cards to All | 4,484** | 4,779** | 690 |
| | (2,238) | (1,869) | (1,409) |
| Bottom 10 - All | 178 | -3155* | 1 |
| | (2091) | (1833) | (1257) |
| Observations | 3,682 | 2,966 | 3,619 |
| Control Group Mean | 29457 | 27941 | 18428 |

# Conclusion

- Sending out identification cards dramatically improved a subsidy
- Results suggest role for many different types of information
  - Public information doubled the impact of the cards
  - Return to increased information per se written on cards
  - Physical proof of information (through cards) important
- Note that this intervention was designed working closely with the Indonesian government
  - Designed in response to a request
  - Scaled up nationally in June 2013
  - Video

# References


- Banerjee, Hanna, Kyle, Olken, and Sumarto (2015). "The Power of Transparency: Information, Identification Cards and Food Subsidy Programs in Indonesia"