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The Mistargeting and Regressive Take Up of the Indonesian Rice Subsidy Program

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Abstract

We evaluate household participation in the Indonesian Raskin program, a national rice price subsidy program for the poor. Using a household panel from the 2000 and 2007 rounds of the Indonesian Family Life Survey (IFLS), we evaluate program participation over the duration of the year prior to the 2007 survey using four different measures of participation. We find that although the poor as a whole are likely to have higher levels of participation compared to the non-poor, program participation is regressive among the poor. The poorest households are less likely to purchase Raskin rice over the course of a year, and conditional on participation, they are likely to purchase lower quantities of rice, purchase rice with lower frequency, and have lower participation relative to the number of community distributions. We also find that this regressive participation among the poorest households is more severe in urban areas.

JEL classification: H40, H50, I38, O20

Keywords: Raskin Program, Food Price Subsidy, Program Take Up, Indonesian Family Life Survey

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Introduction

In this study, we evaluate the targeting and take up of the Indonesian Raskin (Beras untuk Keluarga Miskin – Rice for the Poor) program, a national rice price subsidy scheme for poor households. Raskin is the largest transfer program in terms of government expenditure and includes participation of about half of all households in the country¹. As expenditure on rice constitutes about 30 percent of a poor household's monthly budget, a rice assistance scheme could potentially have a large impact on the wellbeing of the poor. Previous studies on Raskin (including Hastuti et al. 2008, TNP2K 2015, World Bank 2012) indicate weaknesses in program targeting and implementation, leading to significant leakage of the rice to the non-poor. However, despite the known weaknesses in program implementation, the current consensus is that the program is weakly pro-poor with a large number of non-poor households also benefiting from the program. Our study expands on the previous findings on the Raskin program by using the Indonesian Family Life Survey (IFLS) not only to reappraise the issue of targeting, but also to focus on the issue of program take up. Specifically, our study addresses whether in fact the poorest households are less likely to participate in the program. While it is clear from previous studies that significant mistargeting occurs, less is known about program take up by the poor, even those who are properly targeted. Since this program provides a price subsidy and not a free in-kind transfer, the actual beneficiaries of such a subsidy scheme are likely to be those who can afford to purchase the rice. Furthermore, the program requires a lump sum purchase of rice following an irregular distribution schedule, which is likely to be disadvantageous for the targeted poor as they may not have sufficient resources to buy large quantities of rice in a single purchase, especially when credit market imperfections exist.

In this study we evaluate household Raskin participation over the duration of a year using a broader set of participation measures: the likelihood of any purchase of rice, total quantity of purchases, the frequency of purchases, and the participation frequency relative to the number of community distributions of rice. We use household information from the 2000 and 2007 rounds of the IFLS, and evaluate participation in the year prior to 2007. While the Raskin targeting scheme and program mechanism have undergone some changes since 2007 with targeting based on a new

¹ In terms of spending, the Raskin budget has ranged from 6.4 to 21 trillion rupiah (approximately 490 million to 1.6 billion USD using current exchange rates) over the last 10 years. This is equivalent to 23-45 percent of total non-energy transfers.

national Unified Database (BDT – Basis Data Terpadu) of the poor, the issues of mistargeting and ineffective allocation persist (TNP2K 2015, World Bank 2012). The findings from this study, therefore, remain relevant with respect to the current program.

Our findings show that, contrary to previous thinking, Raskin is in fact regressive among the poor. Although poor households as a whole are more likely to participate in the program compared to the non-poor, the poorest in this group benefit less from the program than those with higher incomes in this group. The poorest households are less likely to participate in the program, they purchase lower quantities of rice, they purchase rice fewer times per year, and they participate at a lower frequency with respect to the number of community distributions.

Prior studies have suggested that some of the community-based mistargeting of transfer programs in Indonesia may be due to people in villages having different perceptions about poverty that may not be fully captured by expenditure or proxy means measures (Alatas et al. 2012). We thus supplement our analysis by using a subjective measure of economic wellbeing based on a household's self-ranking on a six-step economic ladder. The results remain consistent using a poverty indicator based on such a self-appraisal of economic ranking in place of household per capita expenditure. Among households who ranked themselves to be in the bottom two steps of the ladder, the poorest are less likely to benefit from the program compared to those with higher expenditures in this group, supporting the finding that program take up among the poor is regressive in nature.

This paper is organized as follows. The next section provides a brief description of the Raskin program. Section 3 describes the data, section 4 provides an overview of the empirical framework, and section 5 presents the regression results. The last section provides a conclusion and a discussion.

Program Description

Indonesia introduced the Raskin program in 2002 as a replacement for the Special Market Operations (*Operasi Pasar Khusus*, OPK) program. The OPK program was part of the social safety net package initiated after the 1997 Asian financial crisis to aid vulnerable households. The Raskin program provides 15 to 20 kg of rice per month to poor and near-poor households at prices 75 to 80 percent below the regular market price. Prior to 2007, although the official price was set at 1000

rupiah per kg, substantial variability in actual price existed across regions, e.g., up to 2900 rupiah per kg in 2006 (Hastuti et al 2008).

With targeted beneficiaries reaching 18.5 million households, Raskin is the largest transfer program targeting poor households in Indonesia in terms of central government expenditure, accounting for around half of all targeted social assistance spending as well as non-energy subsidies. Between 2000 and 2010, the amount of rice allocated for the program averaged 2 million tons per year (World Bank 2012). The Coordinating Ministry of Social Welfare along with *Bulog* (the National Logistics Agency) are the main government bodies responsible for running the program, especially in planning and determining the yearly allocation of rice and the price at which the rice is sold to households.

In principle, the program is implemented in the following way. One year prior to implementation, the program budget is allocated based on the planned beneficiary quota, i.e. the total number of beneficiaries to receive the program. From the inception of the program until 2012, the beneficiary quota remained at the initial 18.5 million households. After the approval of the budget, decisions are made on the beneficiary list, i.e. the list of households that are eligible to receive the program, with allocation decisions made at the national, district, and village levels. Bulog is then instructed to procure the rice and is also responsible for delivering the rice to 50,000 dropping points, which are usually at the subdistrict or village level. From each of the dropping points, it is then the responsibility of village administrations to transport the rice to village distribution points, where beneficiaries can purchase the rice, or deliver it directly to the beneficiaries. Beneficiaries can then ‘purchase’ the rice at a subsidized price, which is the difference between the Bulog purchase price and the value of subsidy provided to Bulog by the government. For instance, in 2014/2015, the Bulog purchase price was 8600 rupiah per kg, while the rice was sold to the beneficiaries at 1600 rupiah per kg (approximately USD 0.15 per kg) which corresponds to a government subsidy of 7000 rupiah per kg.

Like other targeted social transfer programs in Indonesia, the beneficiaries are determined through a combination of proxy means testing and community targeting. The allocation quota for various regions is based on the incidence of poverty in those regions. The central government uses the national list of poor households to determine the regional incidence of poverty and then allocates rice to the various provinces accordingly. In 2007, the list of poor households was based

on the 2005 Household Socioeconomic Survey (PSE-05) conducted by BPS (Central Bureau of Statistics). At the local level, village consultative meetings (*Mudes*) were supposed to determine the final distribution of Raskin rice to the beneficiaries. However, numerous problems existed in the implementation of the program at the local level leading to widespread misallocation of the rice.

The national list of poor households is not perfect and excludes many poor households since it is based on household assets and other observable characteristics, such as occupation and education level of the household head, which may not reflect short term changes in the economic situation of households, thereby providing local bodies the leeway to deviate from the list in distributing the rice. Furthermore, the 2006-2007 Raskin program guidelines did not mandate that the local bodies use the list of poor households to determine beneficiaries, nor did it state that the beneficiaries have to be poor (Hastuti et al. 2008). This has led to a distribution that is not in alignment with the objectives of the Raskin program. Although the program aims to provide food security to the poor and near-poor, there is significant leakage of the rice to the non-poor.

Previous qualitative studies focusing on a few regions indicate other weaknesses in program targeting and implementation (Hastuti et al. 2008). The distribution of rice is irregular in many regions, especially in places that are harder to reach. Some communities do not receive enough rice to be distributed to all the poor households. There is variability in distribution schemes, with some localities distributing rice equally among households and others using a rotational system where different households become eligible to purchase rice in different distribution cycles. The frequency of rice distributions may also be well below the stipulated 10-12 times a year in some localities, especially in more isolated regions. These localities may, subsequently, pool distributions and increase each household's rice allocation for each distribution.

Prior studies have also highlighted the issue of the “missing rice”—that is, not all the rice allocated to the Raskin program reaches the beneficiaries. For the OPK program, the predecessor of Raskin, Olken (2006) estimated that 17.8 percent of the rice from the Bulog distribution centers did not reach the beneficiaries. He estimated the amount of rice that the villages actually received using household responses from the 1998-1999 Hundred Villages Survey (*Survei Seratus Desa - SSD*) along with the 1999 National Social Welfare Survey (*Susenas*). On the other hand, he estimated the amount of rice the villages should have received using administrative data from the

district level Bulog distribution centers. Analyzing the correlates of the missing rice, he found that villages that are poorer, more ethnically fragmented, and with lower population densities are more likely to be missing rice.

Data

The Indonesian Family Life Survey (IFLS) is an extensive longitudinal survey, with the first wave conducted in 1993 which sampled over 7000 households from 13 of the 27 provinces representing 83% of the population. Subsequent waves interviewed target members of the original IFLS1 households along with split-off households with over 90 percent re-contact rates. This study uses the 2000 and 2007 waves of the survey. The sample for the analysis consists of all households in the original IFLS enumeration areas that were interviewed in the 2000 and 2007 rounds. After dropping 93 observations with missing values, the final pooled analysis sample consists of 15682 observations: 7390 from 2000 and 8292 from 2007, of which 6425 households were interviewed in both years.

We evaluate four different measures of household Raskin participation during the year prior to the 2007 survey: (i) whether the household purchased any rice (a measure of *any* participation), (ii) the total quantity of rice (kg) purchased, (iii) the frequency of purchases (number of times purchased), and (iv) the ratio of the frequency of household purchases to the frequency of community distributions (hereafter, referred to as the *household purchases to community distributions ratio – HP-CD ratio*). Unlike the total quantity and frequency of rice purchases, which are influenced by variations in both household participation and community distributions, the last measure captures household participation relative to the number of community distributions, thereby providing a better measure of household program take up independent of variations in community distributions.

Table 1: Descriptive statistics

	Full sample		2000		2007	
	Mean	sd	Mean	sd	Mean	sd
Any Raskin purchased last year	0.28	0.45	0.00	0.00	0.53	0.50
Qty. Raskin rice purchased last year (kg)	10.67	23.16	0.00	0.00	20.19	28.67
Log qty. Raskin rice purchased last year (kg)	0.95	1.58	0.00	0.00	1.79	1.78
Raskin purchase frequency last year	2.02	3.92	0.00	0.00	3.81	4.71
Community Raskin distribution frequency	5.61	5.49	0.00	0.00	10.60	2.03
Raskin HH purchases to community distributions (HP-CD) ratio	0.18	0.35	0.00	0.00	0.35	0.42
Log per capita expenditure (PCE)	12.53	0.83	12.07	0.75	12.93	0.68
Bottom 30% PCE	0.34	0.47	0.34	0.47	0.35	0.48
Log PCE * Bottom 30% PCE	4.05	5.62	3.82	5.35	4.26	5.83
Log per capita income (PCI)	11.12	3.03	10.82	2.82	11.38	3.17
Bottom 30% PCI	0.31	0.46	0.31	0.46	0.31	0.46
Log PCI * Bottom 30% PCI	2.66	4.57	2.56	4.39	2.76	4.72
Bottom 2 subj. rank	0.32	0.47	0.30	0.46	0.33	0.47
Log PCE * Bottom 2 subj. rank	3.90	5.74	3.57	5.43	4.20	5.98
Household head						
Male	0.81	0.39	0.82	0.38	0.81	0.40
Age	47.96	14.81	48.07	14.66	47.87	14.93
Age squared	2,519.63	1,521.23	2,525.78	1,514.08	2,514.16	1,527.64
Years of education	6.29	4.50	5.90	4.44	6.64	4.52
Marital status						
Married	0.81	0.39	0.81	0.39	0.80	0.40
Unmarried	0.02	0.15	0.02	0.12	0.03	0.16
Separated/divorced	0.03	0.18	0.03	0.17	0.03	0.18
Widow(er)	0.14	0.35	0.14	0.35	0.14	0.34
Household size	4.12	1.93	4.31	2.01	3.94	1.83
Number of 0-5 year olds	0.47	0.66	0.48	0.68	0.46	0.65
Number of 6-14 year olds	0.73	0.91	0.80	0.98	0.66	0.83
Own farm land	0.37	0.48	0.40	0.49	0.34	0.47
Own house	0.82	0.38	0.83	0.37	0.81	0.39
Single unit house	0.84	0.37	0.83	0.38	0.85	0.36
Outer wall - masonry	0.67	0.47	0.62	0.48	0.71	0.45
Piped water	0.24	0.43	0.25	0.43	0.23	0.42
Mineral water	0.06	0.24	0.02	0.13	0.10	0.30
Own toilet	0.67	0.47	0.62	0.49	0.72	0.45
Gas/electric stove	0.13	0.34	0.10	0.31	0.15	0.36
Number of rooms	5.45	2.44	5.41	2.56	5.49	2.32
Electricity	0.93	0.26	0.89	0.31	0.96	0.20
TV	0.65	0.48	0.56	0.50	0.74	0.44
No fridge	0.68	0.47	0.73	0.44	0.64	0.48
Waste around house	0.09	0.28	0.09	0.29	0.08	0.27
Trash around house	0.12	0.32	0.13	0.34	0.11	0.31
Floor type						
Marble	0.23	0.42	0.15	0.35	0.30	0.46
Tiles	0.19	0.40	0.21	0.41	0.18	0.38
Cement	0.33	0.47	0.36	0.48	0.30	0.46
Lumber	0.13	0.33	0.13	0.34	0.12	0.33
Dirt	0.11	0.32	0.14	0.35	0.09	0.29
Other	0.01	0.09	0.01	0.09	0.01	0.09
Log distance to nearest bus stop/terminal/pier	1.14	1.06	0.94	0.98	1.32	1.10
Log distance to district capital	2.55	1.11	2.52	1.10	2.58	1.12
Public motor transportation	0.73	0.44	0.76	0.43	0.71	0.45
Asphalt road	0.84	0.37	0.79	0.41	0.88	0.32
Rural	0.54	0.50	0.55	0.50	0.53	0.50
Java-Bali	0.64	0.48	0.64	0.48	0.64	0.48
Sumatra	0.20	0.40	0.20	0.40	0.19	0.39
Outer Islands	0.16	0.37	0.16	0.36	0.17	0.37
Rural*Java-Bali	0.31	0.46	0.32	0.47	0.30	0.46
Rural*Sumatra	0.12	0.33	0.13	0.33	0.12	0.33
Rural*Outer Islands	0.10	0.30	0.10	0.30	0.10	0.30
Observations	15,682		7,390		8,292	

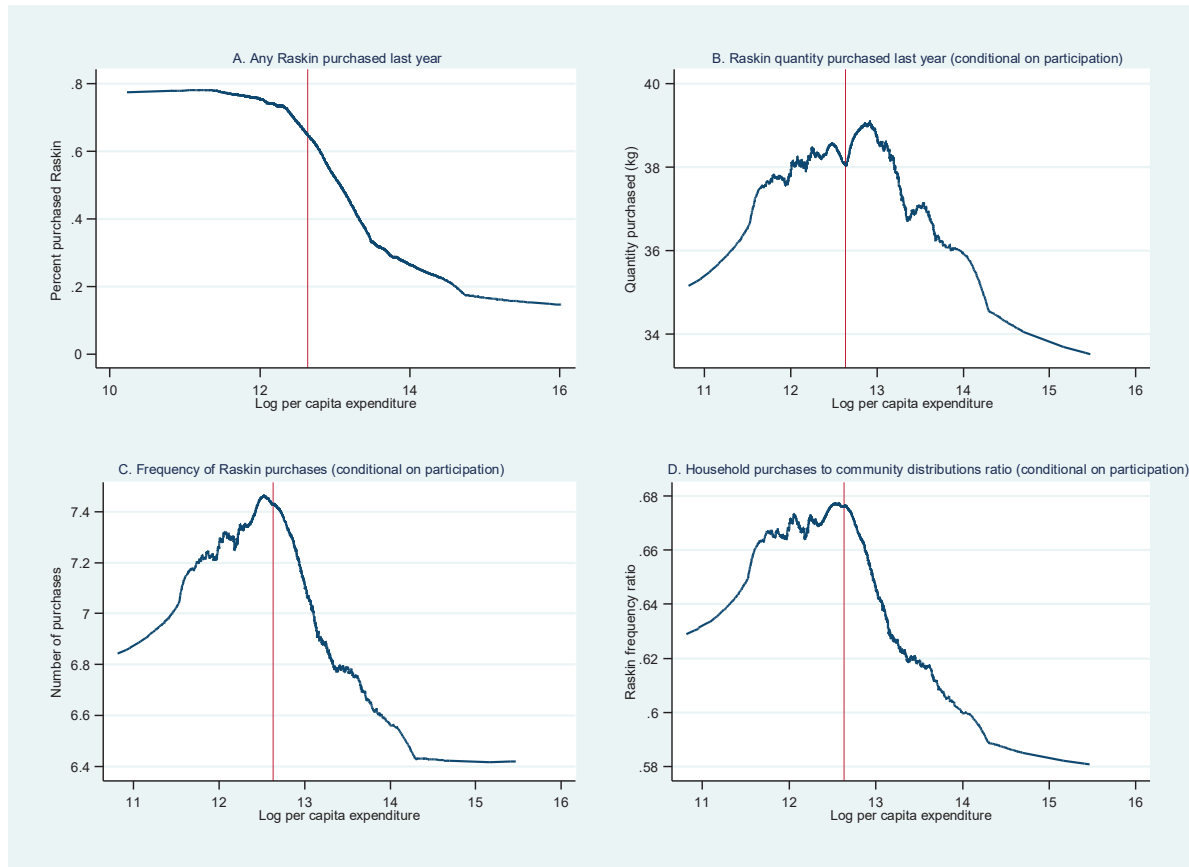
Table 2: Descriptive statistics - rural and urban

	Rural				Urban			
	2000		2007		2000		2007	
	Mean	sd	Mean	sd	Mean	sd	Mean	sd
Any Raskin purchased last year	0.00	0.00	0.64	0.48	0.00	0.00	0.42	0.49
Qty. Raskin rice purchased last year (kg)	0.00	0.00	23.16	28.44	0.00	0.00	16.90	28.57
Log qty. Raskin rice purchased last year (kg)	0.00	0.00	2.12	1.73	0.00	0.00	1.43	1.77
Raskin purchase frequency last year	0.00	0.00	4.42	4.72	0.00	0.00	3.14	4.61
Community Raskin distribution frequency	0.00	0.00	10.31	2.42	0.00	0.00	10.92	1.43
Raskin HH purchases to community distributions (HP-CD) ratio	0.00	0.00	0.41	0.43	0.00	0.00	0.28	0.41
Log per capita expenditure (PCE)	11.89	0.68	12.76	0.62	12.30	0.77	13.12	0.69
Bottom 30% PCE	0.42	0.49	0.44	0.50	0.23	0.42	0.25	0.43
Log PCE * Bottom 30% PCE	4.78	5.58	5.38	6.07	2.64	4.81	3.02	5.29
Log per capita income (PCI)	10.59	2.70	11.24	2.87	11.09	2.94	11.54	3.47
Bottom 30% PCI	0.39	1.49	0.40	0.49	0.21	0.40	0.23	0.42
Log PCI * Bottom 30% PCI	3.43	4.76	3.74	5.14	1.49	3.61	1.67	3.93
Bottom 2 subj. rank	0.34	0.48	0.37	0.48	0.25	0.43	0.29	0.45
Log PCE * Bottom 2 subj. rank	4.03	5.57	4.64	6.09	2.99	5.19	3.71	5.83
Household head								
Male	0.83	0.37	0.82	0.39	0.81	0.39	0.79	0.40
Age	48.20	15.16	47.61	15.10	47.92	14.03	48.15	14.74
Age squared	2,552.53	1,576.66	2,494.58	1,546.41	2,493.00	1,433.23	2,535.82	1,506.51
Years of education	4.63	3.92	5.37	4.05	7.46	4.55	8.05	4.59
Marital status								
Married	0.83	0.37	0.82	0.39	0.79	0.41	0.78	0.41
Unmarried	0.01	0.09	0.02	0.14	0.02	0.16	0.04	0.19
Separated/divorced	0.03	0.17	0.03	0.18	0.03	0.17	0.04	0.18
Widow(er)	0.13	0.34	0.13	0.33	0.15	0.36	0.15	0.35
Household size	4.17	1.90	3.87	1.76	4.48	2.12	4.02	1.91
Number of 0-5 year olds	0.49	0.67	0.45	0.63	0.47	0.69	0.46	0.66
Number of 6-14 year olds	0.86	1.02	0.70	0.85	0.74	0.93	0.63	0.82
Own farm land	0.57	0.49	0.53	0.50	0.18	0.38	0.14	0.35
Own house	0.91	0.29	0.89	0.32	0.74	0.44	0.73	0.45
Single unit house	0.81	0.39	0.86	0.34	0.84	0.36	0.84	0.37
Outer wall - masonry	0.51	0.50	0.59	0.49	0.76	0.42	0.84	0.37
Piped water	0.15	0.35	0.15	0.36	0.37	0.48	0.32	0.47
Mineral water	0.01	0.10	0.04	0.20	0.03	0.16	0.16	0.37
Own toilet	0.52	0.50	0.63	0.48	0.74	0.44	0.82	0.39
Gas/electric stove	0.04	0.20	0.06	0.23	0.18	0.38	0.26	0.44
Number of rooms	5.06	2.27	5.25	2.02	5.84	2.82	5.76	2.58
Electricity	0.83	0.38	0.93	0.26	0.97	0.16	0.99	0.11
TV	0.43	0.50	0.64	0.48	0.72	0.45	0.84	0.37
No fridge	0.84	0.37	0.77	0.42	0.60	0.49	0.49	0.50
Waste around house	0.14	0.34	0.12	0.32	0.04	0.21	0.05	0.21
Trash around house	0.17	0.37	0.13	0.33	0.08	0.27	0.09	0.29
Floor type								
Marble	0.09	0.29	0.20	0.40	0.22	0.41	0.41	0.49
Tiles	0.15	0.35	0.14	0.35	0.30	0.46	0.22	0.41
Cement	0.35	0.48	0.32	0.46	0.36	0.48	0.28	0.45
Lumber	0.16	0.37	0.18	0.38	0.09	0.28	0.07	0.25
Dirt	0.23	0.42	0.15	0.36	0.03	0.18	0.02	0.15
Other	0.02	0.12	0.01	0.11	0.00	0.04	0.00	0.03
Log distance to nearest bus stop/terminal/pier	1.31	1.04	1.86	1.12	0.48	0.66	0.72	0.70
Log distance to district capital	3.09	0.88	3.18	0.88	1.82	0.93	1.91	0.96
Public motor transportation	0.64	0.48	0.62	0.49	0.91	0.29	0.81	0.39
Asphalt road	0.65	0.48	0.79	0.41	0.96	0.20	0.99	0.08
Rural	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Java-Bali	0.59	0.49	0.58	0.49	0.71	0.45	0.71	0.45
Sumatra	0.23	0.42	0.23	0.42	0.16	0.37	0.15	0.36
Outer Islands	0.18	0.39	0.19	0.39	0.12	0.33	0.14	0.35
Rural*Java-Bali	0.59	0.49	0.58	0.49	0.00	0.00	0.00	0.00
Rural*Sumatra	0.23	0.42	0.23	0.42	0.00	0.00	0.00	0.00
Rural*Outer Islands	0.18	0.39	0.19	0.39	0.00	0.00	0.00	0.00
Observations	4,069		4,355		3,321		3,937	

Table 1 presents the descriptive statistics for the full 2000 and 2007 pooled sample, as well as for the separate years. In 2007, 53 percent of households had purchased Raskin rice in the past year. For the full sample, the average annual quantity of rice purchased was 20 kg and the average frequency of purchase was 3.81 times per year. On average, there were 10.6 community distributions per year and the household purchases to community distributions ratio was 0.35.

Table 2 presents the descriptive statistics by rural and urban for the two survey years. Some variation in Raskin participation exists between urban and rural households. Rural households were more likely to participate in Raskin, with 64 percent of the sample having purchased rice in the past year compared to 42 percent of urban households. The average annual quantity of rice purchased for rural households was 23.16 kg while it was 16.90 kg for urban households, and rural households purchased rice 4.42 times on average in a year compared to 3.14 times for urban households. The average number of community distributions is similar between rural and urban areas (10.31 and 10.92, respectively). However, the household purchases to community distributions ratio is higher for rural households (0.41 compared to 0.28 for urban households), suggesting that rural households have fuller participation in the program with respect to the number of community distributions.

Figure 1: Raskin participation by log per capita expenditure



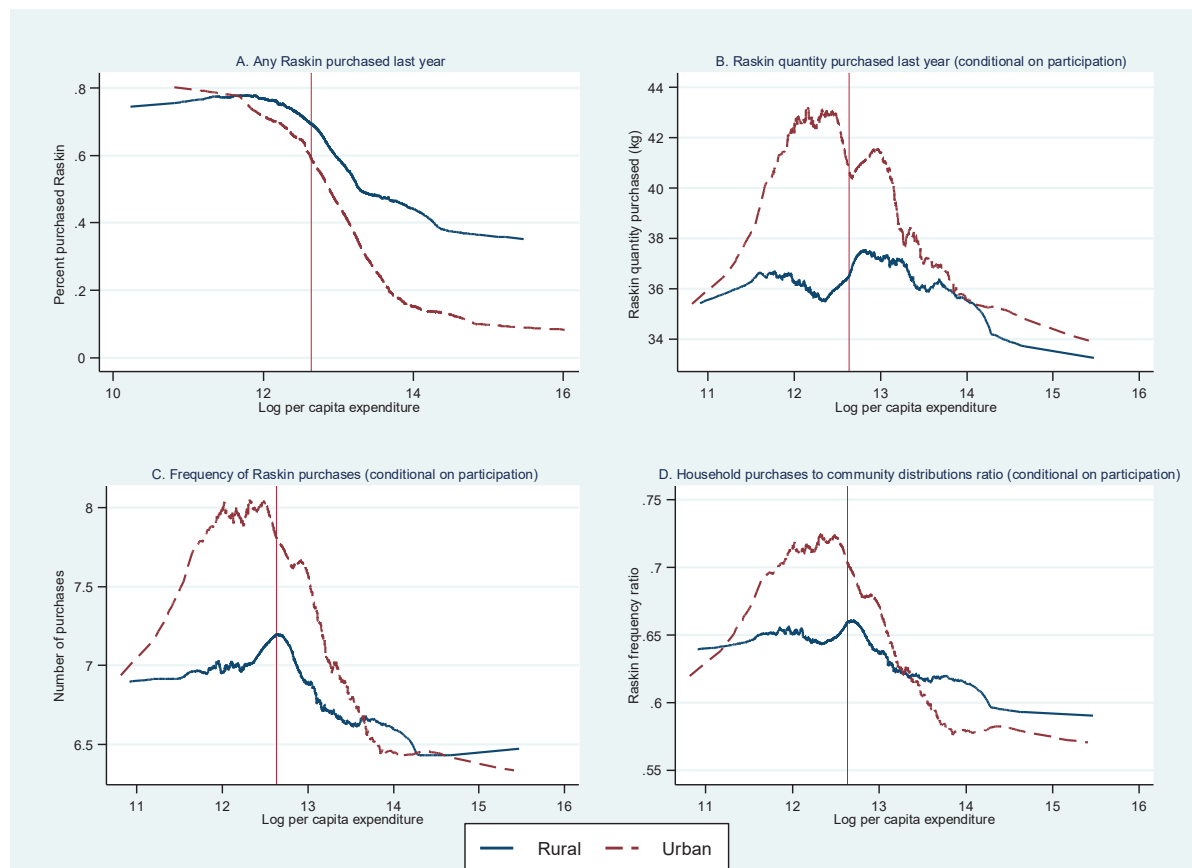
Notes: The means were computed using a tricube weighting function with a bandwidth of 0.4. The vertical line represents the bottom 30 percent per capita expenditure threshold.

Using the 2007 data, Figure 1 presents the weighted means of the household Raskin participation measures by log household per capita expenditure (PCE). The weighted means are computed using a tri-cube weighting function with a bandwidth of 0.4. The vertical line represents the PCE threshold for the bottom 30 percent. Figure 1A presents the likelihood of any participation in Raskin, i.e. purchased any Raskin rice in the past year. Figures 1B, 1C, and 1D present the weighted means, conditional on any participation in the past year, of the total quantity of Raskin rice purchased, the number of purchases, and the household purchases to community distributions ratio, respectively.

Figure 1A suggests that the likelihood of any Raskin participation falls with PCE. The likelihood of any participation among the poorest group is about 80 percent. While participation declines steadily with rising PCE, a significant portion of non-poor households

participate in the program. Although overall participation in the program falls with higher PCE, Figures 1B, 1C, and 1D show that, conditional on participation, the benefits derived from Raskin increases with PCE among poor households, i.e. those with PCE in the bottom 30 percent. This suggests a regressive distribution of rice among poor households; higher expenditure households among the poor are likely to purchase larger quantities of rice, purchase rice more frequently, and purchase rice with higher frequency with respect to the number of distributions in the community.

Figure 2: Raskin participation by log per capita expenditure: rural and urban



Notes: The means were computed using a tricube weighting function with a bandwidth of 0.4. The vertical line represents the bottom 30 percent per capita expenditure threshold.

Figure 2 presents the weighted means of the participation measures for rural and urban households. The figures suggest significant differences in the nature of participation in rural and urban areas. Figure 2A shows that the likelihood of any Raskin participation with respect to PCE declines faster in urban areas compared to rural areas. Rural areas have higher Raskin participation

rates among non-poor households (i.e. those above the bottom 30 percent PCE threshold), with participation in the 40 percent range for the highest PCE households. The subsequent figures (Figures 2B, 2C, and 2D) show that, conditional on participation, the benefits derived from Raskin in urban areas increases substantially with PCE among poor households and then starts to decline with PCE beyond the bottom 30 percent threshold. This suggests a regressive distribution of rice among poor households in urban areas. This regressive phenomenon is weaker in rural areas: conditional on participation, the rice is distributed more equally, both in terms of quantity and frequency, across a wider range of per capita expenditures.

Empirical Framework

Our general empirical strategy is to relate the Raskin participation measures to household log per capita expenditure and an indicator for poverty status with additional controls for household and community characteristics. We run ordinary least square regressions (OLS) using two different specifications using the 2000 and 2007 pooled household sample:

$$(1) \quad R_{it} = \beta_0 + \beta_1 lpce_{it} + \beta_2 POV_{it} + \beta_4 X_{it} + \mu_i + \tau_{2007} + \varepsilon_{it}$$

$$(2) \quad R_{it} = \beta_0 + \beta_1 lpce + \beta_2 POV_{it} + \beta_3 lpce * POV_{it} + \beta_4 X_{it} + \mu_i + \tau_{2007} + \varepsilon_{it}$$

where R_{it} is the Raskin participation measure of household i in period t . $lpce_{it}$ is the household log per capita expenditure and POV_{it} is the poverty indicator. X_{it} is the vector of household and community characteristics. τ_{2007} is a dummy for the year 2007. As Figure 2 suggests variations in Raskin participation among rural and urban areas, we first run the regressions for the full sample and then separately for rural and urban households. We compute robust standard errors to correct for potential heteroscedasticity. We also run the regressions with household fixed effects (μ_i) to account for unobserved time invariant household characteristics. Particularly, we are concerned about unobserved heterogeneity at the household level related to the selection of beneficiaries; besides using PMT-related indicators, the selection of beneficiaries also relied on input from village leaders. In addition, since our sample is restricted to households who are in the original IFLS enumeration areas, taking household fixed effects will also account for time invariant unobserved community characteristics that determine the amount of missing rice in the localities.

We evaluate two aspects of program participation among the poor: 1) whether the program is pro-poor overall (i.e. whether the poor are more likely to participate compared to the non-poor) and 2) whether program participation is uniform among the poor. Specification (1) above is used to evaluate the first aspect of program participation and the coefficient on the poverty indicator, β_2 , will indicate whether the poor overall are more likely to participate. Specification (2) includes an interaction term between log per capita expenditure and the poverty indicator. The coefficients on the poverty indicator, β_2 , and on the interaction term, β_3 , will provide insights about program participation among the poor. A positive coefficient on the interaction term will imply that program participation among the poor is regressive, i.e. those with higher per capita expenditures have higher program participation.

The regressions control for an extensive set of households characteristics. We include household head characteristics (gender, age, education, marital status), household size, number of children in the household under 15 years old, ownership of farm land, household living conditions (such as house ownership, single unit house, number of rooms, type of outer wall and floor, source of drinking water, own toilet, gas or electric stove, electricity, no fridge, waste and trash around house). Some of these household characteristics are typically used to generate the poverty classification through proxy means testing and their inclusion will control for observable characteristics used to determine program targeting.²

We include community characteristics that reflect the accessibility of the community and its transportation infrastructure development. As Raskin distributions are thought to be affected by the distance of the community from the Bulog distribution center, we control for the distance of the community from the district headquarter. We also account for other factors that could potentially affect the transaction costs of transferring the rice from the distribution center to households, such as the distance to the nearest bus stop/terminal/pier, whether the community has

² After the Asian Financial Crisis in 1997/98, Indonesia launched Social Safety Net programs targeting the poor and vulnerable population. These programs constituted the country's first generation of targeted programs and operated in five major sectors: food security, employment creation, education, health, and community empowerment (Sumarto and Bazzi 2014). They were replaced by the second generation targeted programs which used proxy means testing (PMT) for the first time to generate the list of eligible households. The first PMT was based on the 2005 Household Socioeconomic Survey (PSE-05). Subsequently, the PMTs were updated using the 2008 and 2011 rounds of the PPLS (*Pendataan Program Perlindungan Sosial* – Data Collection for Social Assistance Programs) (Bah, Nazara and Satriawan 2015).

an asphalt main road, and whether the community has any motorized public transportation (three wheel, four wheel, or boat) based on the responses from the community questionnaire.

Given the geographical heterogeneity of Indonesia, program participation and distribution schemes are likely to differ across regions. The provinces in Java and Bali are more densely populated with better infrastructure compared to those in Sumatra and the Outer Islands³. Accordingly, we include dummies for Sumatra and Outer Islands along with their interactions with the rural dummy to account for the heterogeneity of program participation across geographical regions.

Results

Full sample results

Table 3 and Table 4 present the pooled OLS results with and without household fixed-effects, respectively, for the four different measures of Raskin participation in the past year. In each table, column 1 presents the results for any participation, column 2 for the quantity of Raskin rice purchased, column 3 for the frequency of purchases, and column 4 for the household purchases to community distributions (HP-CD) ratio. For each participation measure, the first sub-column presents results for the specification with log per capita expenditure (PCE) and the bottom 30 percent PCE poverty indicator without an interaction between the two variables. The second sub-column adds an interaction of log PCE and the poverty indicator to the previous specification. In the first specification without the PCE-poverty interaction term, the coefficient on the poverty indicator indicates whether the program overall is pro-poor, i.e. whether the poor as a whole have higher program participation compared to the non-poor. Including the PCE-poverty interaction term allows us to make inferences about regressive program participation among the poor. Controls for household and community characteristics along with rural and regional dummies are included in all regressions, but are not reported in the tables.

³ The IFLS sample consists of five provinces in *Java* - West Java, Jakarta, Central Java, Yogyakarta, and West Java – while *Bali* is a province in itself. The IFLS provinces in *Sumatra* are Aceh, North Sumatra, West Sumatra, South Sumatra, and Lampung, while the provinces in the *Outer Islands* are North Sulawesi, South Sulawesi, South Kalimantan, West Kalimantan, and West Nusa Tenggara (Strauss, Witoelar, Sikoki, and Wattie 2009).

Table 3: Pooled OLS results for Raskin participation using bottom 30 percent per capita expenditure (PCE) poverty classification

VARIABLES	1. Any purchase		2. Log quantity purchased (kg)		3. Purchase frequency		4. HP-CD ratio	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff
Log PCE	-0.041*** (0.008)	-0.082*** (0.008)	-0.143*** (0.026)	-0.280*** (0.029)	-0.377*** (0.069)	-0.707*** (0.078)	-0.029*** (0.005)	-0.052*** (0.006)
Bottom 30% PCE	0.039*** (0.010)	-2.417*** (0.138)	0.127*** (0.035)	-8.159*** (0.523)	0.338*** (0.094)	-19.635*** (1.554)	0.020*** (0.007)	-1.373*** (0.118)
Log PCE*Bottom 30% PCE		0.204*** (0.012)		0.690*** (0.045)		1.663*** (0.135)		0.116*** (0.010)
Year 2007	0.590*** (0.021)	0.558*** (0.021)	1.977*** (0.077)	1.871*** (0.076)	4.346*** (0.215)	4.088*** (0.210)	0.318*** (0.017)	0.301*** (0.016)
Observations	15,682	15,682	15,682	15,682	15,682	15,682	15,682	15,682
R-squared	0.452	0.467	0.428	0.442	0.324	0.338	0.517	0.525
HH characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Community characteristics	YES	YES	YES	YES	YES	YES	YES	YES
HH fixed effects	NO	NO	NO	NO	NO	NO	NO	NO

NOTE: Robust standard errors clustered at the community level; *** p<0.01, ** p<0.05, * p<0.1; Household characteristics included in the regressions are household head characteristics (male, age, age squared, marital status), household size, number of children, own farm land, own house, and household living conditions (single unit house, outer wall masonry, source of drinking water, own toilet, gas/electric stove, number of rooms, electricity, TV, no fridge, waste and trash around house, type of floor). Community characteristics included in the regressions are distance to bus stop/terminal/pier, distance to district capital, availability of public motorized transport, and asphalt main road. A dummy variable for rural and dummies for Sumatra and Outer Islands along with their interactions with rural are included. Dummy variables are also included for missing value imputations for household per capita expenditure, quantity and frequency of Raskin purchases by the household, and the number of Raskin community distributions.

The pooled OLS results in Table 3 suggest that while overall participation falls with household PCE, participation among the poor increases with household PCE. The results for any Raskin purchase from the first specification (without the poverty-PCE interaction) suggest that poor households are 3.9 percentage points more likely to participate in the program over the course of the year compared to the non-poor after controlling for observable characteristics. Including the poverty-PCE interaction term, however, leads to a negative coefficient on the poverty indicator and a positive coefficient on the interaction term, both of which are significant at the 1 percent level (column 2). This suggests a regressive participation among the poor with the likelihood of program participation increasing with PCE among the poor.

The same patterns are observed for participation measures that capture the intensity of program participation. Among the poor, the poorest households purchase lower quantities of Raskin rice and purchase the rice fewer times over the year. These results suggest that program misallocation has additional distributional consequences besides leakage to the non-poor. Regressive participation among the poorest suggests that the most vulnerable households may not be deriving the intended benefits from the program.

The quantity and frequency of purchases provide insights into the intensity of household program participation. However, the variations in these participation measures could be due to differences in community distribution and targeting schemes besides differences in household take up decisions. The household purchases to community distributions ratio (HP-CD ratio), on the other hand, provides a better measure of household take up choices that accounts for variations in community distribution schemes. In the first regression specification without the PCE-poverty interaction term, the coefficient on the poverty indicator is positive suggesting overall the poor receive rice more frequently than the non-poor within a community. However, including the PCE-poverty interaction term indicates that program take up among the poor is regressive, with the poorest households in this group likely to purchase the subsidized rice at a lower frequency relative to the number of community distributions over the course of a year.

Table 4: Fixed effects results for Raskin participation using bottom 30 percent per capita expenditure (PCE) poverty classification

VARIABLES	1. Any purchase		2. Log quantity purchased (kg)		3. Purchase frequency		4. HP-CD ratio	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff
Log PCE	-0.013 (0.021)	-0.086*** (0.023)	-0.032 (0.074)	-0.287*** (0.079)	-0.073 (0.200)	-0.682*** (0.212)	-0.009 (0.018)	-0.064*** (0.020)
Bottom 30% PCE	0.013 (0.024)	-3.597*** (0.374)	0.047 (0.086)	-12.467*** (1.394)	0.081 (0.225)	-29.878*** (4.072)	0.007 (0.020)	-2.690*** (0.360)
Log PCE*Bottom 30% PCE		0.300*** (0.031)		1.039*** (0.117)		2.488*** (0.340)		0.224*** (0.030)
Year 2007	0.556*** (0.038)	0.518*** (0.038)	1.892*** (0.139)	1.760*** (0.138)	3.972*** (0.400)	3.657*** (0.389)	0.370*** (0.039)	0.341*** (0.038)
Observations	15,682	15,682	15,682	15,682	15,682	15,682	15,682	15,682
R-squared	0.588	0.615	0.558	0.584	0.456	0.482	0.462	0.487
Number of households	9,290	9,290	9,290	9,290	9,290	9,290	9,290	9,290
HH characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Community characteristics	YES	YES	YES	YES	YES	YES	YES	YES
HH fixed effects	YES	YES	YES	YES	YES	YES	YES	YES

NOTE: Robust standard errors clustered at the community level; *** p<0.01, ** p<0.05, * p<0.1; Household characteristics included in the regressions are household head characteristics (male, age, age squared, marital status), household size, number of children, own farm land, own house, and household living conditions (single unit house, outer wall masonry, source of drinking water, own toilet, gas/electric stove, number of rooms, electricity, TV, no fridge, waste and trash around house, type of floor). Community characteristics included in the regressions are distance to bus stop/terminal/pier, distance to district capital, availability of public motorized transport, and asphalt main road. A dummy variable for rural and dummies for Sumatra and Outer Islands along with their interactions with rural are included. Dummy variables are also included for missing value imputations for household per capita expenditure, quantity and frequency of Raskin purchases by the household, and the number of Raskin community distributions.

Accounting for unobserved heterogeneity by including household fixed effects does not change the results on regressive participation among the poor (Table 4). This specification accounts for time-invariant unobserved household specific characteristics that could be correlated with program participation and household per capita expenditure. We still find a positive and significant coefficient for the PCE-poverty interaction term suggesting regressive participation among the poor for all participation measures. In comparison to the previous pooled OLS results, the fixed effects results differ in the first specifications without the PCE-poverty interaction term. Both PCE and the poverty dummy lose significance in this specification. However, after incorporating the poverty-PCE interaction term, all coefficients are statistically significant with larger point estimates, suggesting greater regressive participation among the poorest than implied by the pooled OLS results without household fixed effects.

Rural vs. urban

Table 5 presents fixed effects results separately for rural and urban areas. For each of the four Raskin participation measures, we only present the results for the specification that includes the PCE-poverty interaction term.

Table 5: Fixed effects results for Raskin participation using bottom 30 percent per capita expenditure (PCE) poverty classification: rural and urban

VARIABLES	1. Rural				2. Urban			
	(a) Any purchase	(b) Log quantity	(c) Purchase frequency	(d) HP-CD ratio	(e) Any purchase	(f) Log quantity	(g) Purchase frequency	(h) HP-CD ratio
Log PCE	-0.091*** (0.033)	-0.286** (0.115)	-0.670** (0.328)	-0.065** (0.031)	-0.051 (0.031)	-0.192* (0.112)	-0.473* (0.283)	-0.040 (0.025)
Bottom 30% PCE	-2.370*** (0.522)	-7.618*** (1.871)	-18.458*** (5.327)	-1.634*** (0.457)	-5.057*** (0.588)	-18.839*** (2.292)	-47.381*** (7.079)	-4.220*** (0.640)
Log PCE*Bottom 30% PCE	0.195*** (0.043)	0.628*** (0.156)	1.519*** (0.443)	0.134*** (0.038)	0.425*** (0.049)	1.580*** (0.189)	3.973*** (0.587)	0.354*** (0.053)
Year 2007	0.619*** (0.059)	2.090*** (0.211)	4.199*** (0.600)	0.404*** (0.059)	0.411*** (0.051)	1.406*** (0.181)	3.134*** (0.519)	0.277*** (0.048)
Observations	8,424	8,424	8,424	8,424	7,258	7,258	7,258	7,258
R-squared	0.688	0.652	0.539	0.547	0.518	0.501	0.436	0.441
Number of households	5,106	5,106	5,106	5,106	4,628	4,628	4,628	4,628
HH characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Community characteristics	YES	YES	YES	YES	YES	YES	YES	YES
HH fixed effects	YES	YES	YES	YES	YES	YES	YES	YES

NOTE: Robust standard errors clustered at the community level; *** p<0.01, ** p<0.05, * p<0.1; Household characteristics included in the regressions are household head characteristics (male, age, age squared, marital status), household size, number of children, own farm land, own house, and household living conditions (single unit house, outer wall masonry, source of drinking water, own toilet, gas/electric stove, number of rooms, electricity, TV, no fridge, waste and trash around house, type of floor). Community characteristics included in the regressions are distance to bus stop/terminal/pier, distance to district capital, availability of public motorized transport, and asphalt main road. A dummy variable for rural and dummies for Sumatra and Outer Islands along with their interactions with rural are included. Dummy variables are also included for missing value imputations for household per capita expenditure, quantity and frequency of Raskin purchases by the household, and the number of Raskin community distributions.

The findings on program participation with respect to per capita expenditure and the poverty indicator in both rural and urban areas are similar to those for the full sample: overall, participation falls with higher per capita expenditure, but among the poor, participation is regressive as it increases with per capita expenditure. The coefficient on log PCE is negative and statistically significant for all participation measures for rural areas, but loses significance for the likelihood of any purchase and the HP-CD ratio for urban areas. The coefficient on the poverty-PCE interaction term, on the other hand, is positive and significant at the 1 percent level for all participation measures for both rural and urban areas.

Comparing the rural and urban regression results, the urban areas have a more regressive participation among the poor. For the urban regressions, the coefficients for both the PCE poverty indicator and the PCE-poverty interaction term are of greater magnitude compared to the rural regressions. This suggests that urban areas have a steeper increase in participation with respect to PCE among the poor. For instance, in the results for any Raskin participation in the last year, the coefficient on the PCE poverty indicator is -2.37 for rural and -5.06 for urban, while the coefficient on the interaction term is 0.20 for rural and 0.43 for urban. This pattern holds for the other three Raskin participation measures.

Robustness checks

So far we have used a poverty classification based on whether a household is in the bottom 30 percent of the per capita expenditure distribution. We use this classification as the Indonesian government defines official poverty using household per capita expenditure and targeted social protection programs to approximately 30 percent of the population during the evaluation period. Another advantage of using household expenditure instead of household income as a measure of household wellbeing is that the former is a less volatile measure. In less-developed countries, household income for the poor is likely to vary significantly from one month to the next due to seasonality of agricultural income and the unpredictability of employment and earnings in the informal sector. Household expenditures, on the other hand, can be a better proxy for permanent income due to consumption smoothing by households.

However, since program distribution at the local level may be based on different notions of poverty and program eligibility, we also test whether our results are robust to different poverty

classifications. First, we conduct robustness checks for poverty classifications using other welfare measures besides per capita expenditure. Second, we check if the results hold for poverty classifications using different threshold values of per capita expenditure.

We first test whether our results hold when using a poverty classification based on monthly household per capita income (PCI) instead of per capita expenditure. We define the poor as those in the bottom 30 percent of the PCI distribution. The results are consistent with those using the PCE poverty classification—overall participation falls with per capita income, but among those in the bottom 30 percent, participation increases with higher income, suggesting regressive participation for all four participation measures (see Table A1 in the Appendix). However, the coefficients on the poverty dummy and the PCI-poverty interaction term are smaller with respect to the results using the PCE poverty classification.

Program allocation at the local level may also be based on local perceptions about poverty using additional information about household living conditions not fully captured by per capita expenditure or per capita income. To test that the results on regressive participation are not purely due to communities using different poverty criteria for targeting based on local information, but also due to low take up by the poorest, we test whether regressive participation holds when we define poverty based on subjective self-appraisal by households. We classify a household as poor if it ranked itself in the bottom two steps of a six-step economic ladder. Approximately 30 percent of the sample classified itself to be in the bottom two steps. Once again, the results are consistent with regressive participation among the poor (Table A3 in the Appendix). Among those who classified themselves in the bottom two-steps, participation increases with higher per capita expenditure. As in the case with the PCI poverty classification, the parameter estimates are smaller than those estimated using the PCE poverty classification. These results further suggest that the regressive participation is not only due to targeting errors, but due to low take up among the poorest households.

We also test whether the results are sensitive to our choice of poverty threshold. We run separate regressions using different poverty thresholds, defining a household as poor if it is in the bottom 25 percent, bottom 35 percent, and bottom 40 percent of the PCE distribution. The results are presented in Tables A5, A6, and A7 in the Appendix. The findings on regressive participation

do not change with any of these poverty thresholds, with participation rising among the poor for higher per capita expenditure for all participation measures.

Conclusion

In this paper, we evaluated household Raskin program participation over the duration of a year along four measures: i) any participation, ii) quantity of rice purchases, iii) frequency of purchases, and iv) frequency of purchases relative to the number of community distributions. Using the pooled sample of households from the 2000 and 2007 rounds of the IFLS, we found that while the program is pro-poor overall, i.e. the poor as a whole are likely to have higher participation than the non-poor, the program is regressive among the poor – the poorest have lower participation than those with higher per capita expenditures within this group. The poorest are less likely to have any participation in the program, they purchase lower quantities of rice, purchase rice fewer times per year, and participate at lower rates with respect to the number of community distributions. Furthermore, there is variation in program participation between poor households in rural areas and those in urban areas - the regressive phenomenon among the poor is stronger among urban households. While the regressive participation among the poorest is still prevalent in rural areas, the program is more equitably distributed, not only among poor households, but also among non-poor households across a wider range of per capita expenditures.

As Raskin is the largest government transfer program in Indonesia, the findings from this research have important policy implications. While our findings reinforce earlier findings about mistargeting and leakage to the non-poor, our research also shows that the most vulnerable households may not be deriving the intended benefits from the program. Further research is needed to ascertain the factors that contribute towards low program take up among the poorest households. The findings on regressive participation among the poor provide additional justification for reforms in the program's rice distribution mechanism. The current mechanism requires the beneficiaries to make a lump sum purchase of rice at subsidized price once a month, often with irregular distribution schedules. This, among other factors, may explain why the targeted poor households who are resource-constrained receive lower quantities of Raskin rice than what is allocated to them.

The findings in this paper provide support for switching the program from a rice subsidy scheme to a full social assistance scheme by removing the lump-sum payment requirement. Furthermore, switching from an in-kind transfer program towards a cash transfer program where the beneficiaries receive an equivalent value in the form of a restricted cash assistance is likely to be welfare enhancing for the poorest households. These changes will arguably be more effective in improving the welfare of the poor by providing them the flexibility to purchase food items they want at the quantity they need without requiring them to allocate resources to make the purchase.

Our findings, therefore, provide additional support for ongoing program reforms. In 2017, the Government of Indonesia piloted food vouchers in a number of cities as a way to reform Raskin. The new program electronically transfers program benefits directly to the bank accounts of the beneficiaries, who can then use the transfers to purchase rice and other pre-determined food items at market prices in local shops. Such new program features are likely to address some of the issues associated with regressive participation among the poor in the Raskin program.

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APPENDIX

Table A1: Fixed effects results for Raskin participation using bottom 30 percent per capita income (PCI) poverty classification

VARIABLES	1. Any purchase		2. Log quantity purchased (kg)		3. Purchase frequency		4. HP-CD ratio	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff
Log PCI	0.004 (0.003)	-0.074*** (0.016)	0.011 (0.013)	-0.232*** (0.055)	0.012 (0.035)	-0.561*** (0.142)	0.001 (0.003)	-0.052*** (0.013)
Bottom 30% PCI	0.026 (0.023)	-0.967*** (0.190)	0.065 (0.083)	-3.033*** (0.675)	0.229 (0.230)	-7.081*** (1.787)	0.021 (0.021)	-0.649*** (0.161)
Log PCI*Bottom 30% PCI		0.084*** (0.016)		0.263*** (0.058)		0.620*** (0.152)		0.057*** (0.014)
Year 2007	0.543*** (0.033)	0.573*** (0.034)	1.859*** (0.122)	1.955*** (0.126)	3.891*** (0.352)	4.119*** (0.367)	0.361*** (0.034)	0.381*** (0.036)
Observations	15,682	15,682	15,682	15,682	15,682	15,682	15,682	15,682
R-squared	0.588	0.594	0.557	0.562	0.455	0.460	0.461	0.466
Number of households	9,290	9,290	9,290	9,290	9,290	9,290	9,290	9,290
HH characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Community characteristics	YES	YES	YES	YES	YES	YES	YES	YES
HH fixed effects	YES	YES	YES	YES	YES	YES	YES	YES

NOTE: Robust standard errors clustered at the community level; *** p<0.01, ** p<0.05, * p<0.1; Household characteristics included in the regressions are household head characteristics (male, age, age squared, marital status), household size, number of children, own farm land, own house, and household living conditions (single unit house, outer wall masonry, source of drinking water, own toilet, gas/electric stove, number of rooms, electricity, TV, no fridge, waste and trash around house, type of floor). Community characteristics included in the regressions are distance to bus stop/terminal/pier, distance to district capital, availability of public motorized transport, and asphalt main road. A dummy variable for rural and dummies for Sumatra and Outer Islands along with their interactions with rural are included. Dummy variables are also included for missing value imputations for the quantity and frequency of Raskin purchases by the household and the number of Raskin community distributions.

Table A2: Fixed effects results for Raskin participation using bottom 30 percent per capita income (PCI) poverty classification: rural and urban

VARIABLES	1. Rural				2. Urban			
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
	Any purchase	Log quantity	Purchase frequency	HP-CD ratio	Any purchase	Log quantity	Purchase frequency	HP-CD ratio
Log PCI	-0.061** (0.026)	-0.193** (0.092)	-0.485** (0.241)	-0.044* (0.023)	-0.068*** (0.022)	-0.210** (0.082)	-0.562*** (0.209)	-0.049*** (0.018)
Bottom 30% PCI	-0.799** (0.312)	-2.522** (1.100)	-6.165** (2.940)	-0.543** (0.265)	-0.895*** (0.280)	-2.773*** (1.037)	-7.205*** (2.685)	-0.640*** (0.235)
Log PCI*Bottom 30% PCI	0.070*** (0.027)	0.221** (0.094)	0.554** (0.250)	0.049** (0.023)	0.077*** (0.024)	0.236*** (0.088)	0.613*** (0.227)	0.055*** (0.020)
Year 2007	0.638*** (0.050)	2.158*** (0.187)	4.374*** (0.511)	0.414*** (0.051)	0.503*** (0.052)	1.724*** (0.187)	3.945*** (0.579)	0.350*** (0.054)
Observations	8,424	8,424	8,424	8,424	7,258	7,258	7,258	7,258
R-squared	0.681	0.646	0.534	0.542	0.470	0.445	0.379	0.383
Number of households	5,106	5,106	5,106	5,106	4,628	4,628	4,628	4,628
HH characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Community characteristics	YES	YES	YES	YES	YES	YES	YES	YES
HH fixed effects	YES	YES	YES	YES	YES	YES	YES	YES

NOTE: Standard errors clustered at the community level; *** p<0.01, ** p<0.05, * p<0.1; Household characteristics included in the regressions are household head characteristics (male, age, age squared, marital status), household size, number of children, own farm land, own house, and household living conditions (single unit house, outer wall masonry, source of drinking water, own toilet, gas/electric stove, number of rooms, electricity, TV, no fridge, waste and trash around house, type of floor). Community characteristics included in the regressions are distance to bus stop/terminal/pier, distance to district capital, availability of public motorized transport, and asphalt main road. A dummy variable for rural and dummies for Sumatra and Outer Islands along with their interactions with rural are included. Dummy variables are also included for missing value imputations for the quantity and frequency of Raskin purchases by the household and the number of Raskin community distributions.

Table A3: Fixed effects results for Raskin participation using subjective ranking poverty classification

VARIABLES	1. Any purchase		2. Log quantity purchased (kg)		3. Purchase frequency		4. HP-CD ratio	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff
Log PCE	-0.018 (0.020)	-0.059*** (0.021)	-0.050 (0.070)	-0.189** (0.076)	-0.099 (0.181)	-0.388** (0.193)	-0.011 (0.017)	-0.040** (0.018)
Bottom 2 subj. rank	0.019 (0.019)	-1.573*** (0.246)	0.077 (0.070)	-5.355*** (0.851)	0.209 (0.190)	-11.080*** (2.328)	0.024 (0.017)	-1.119*** (0.215)
Log PCE* Bottom 2 subj. rank		0.129*** (0.020)		0.441*** (0.070)		0.916*** (0.191)		0.093*** (0.018)
Year 2007	0.560*** (0.039)	0.557*** (0.039)	1.906*** (0.141)	1.895*** (0.141)	3.989*** (0.392)	3.967*** (0.391)	0.370*** (0.039)	0.368*** (0.039)
Observations	15,682	15,682	15,682	15,682	15,682	15,682	15,682	15,682
R-squared	0.589	0.597	0.558	0.566	0.456	0.462	0.462	0.469
Number of households	9,290	9,290	9,290	9,290	9,290	9,290	9,290	9,290
HH characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Community characteristics	YES	YES	YES	YES	YES	YES	YES	YES
HH fixed effects	YES	YES	YES	YES	YES	YES	YES	YES

NOTE: Standard errors clustered at the community level; *** p<0.01, ** p<0.05, * p<0.1; Household characteristics included in the regressions are household head characteristics (male, age, age squared, marital status), household size, number of children, own farm land, own house, and household living conditions (single unit house, outer wall masonry, source of drinking water, own toilet, gas/electric stove, number of rooms, electricity, TV, no fridge, waste and trash around house, type of floor). Community characteristics included in the regressions are distance to bus stop/terminal/pier, distance to district capital, availability of public motorized transport, and asphalt main road. A dummy variable for rural and dummies for Sumatra and Outer Islands along with their interactions with rural are included. Dummy variables are also included for missing value imputations for household per capita expenditure, quantity and frequency of Raskin purchases by the household, and the number of Raskin community distributions.

Table A4: Fixed effects results for Raskin participation using subjective ranking poverty classification: rural and urban

VARIABLES	1. Rural				2. Urban			
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
	Any purchase	Log quantity	Purchase frequency	HP-CD ratio	Any purchase	Log quantity	Purchase frequency	HP-CD ratio
Log PCE	-0.065** (0.030)	-0.212** (0.106)	-0.366 (0.287)	-0.042 (0.028)	-0.032 (0.032)	-0.111 (0.115)	-0.262 (0.292)	-0.023 (0.026)
Bottom 2 subj. rank	-1.482*** (0.348)	-5.084*** (1.196)	-8.764*** (3.309)	-0.938*** (0.310)	-1.500*** (0.442)	-5.383*** (1.539)	-13.534*** (3.967)	-1.262*** (0.351)
Log PCE* Bottom 2 subj. rank	0.122*** (0.029)	0.421*** (0.099)	0.738*** (0.275)	0.079*** (0.026)	0.124*** (0.036)	0.443*** (0.124)	1.111*** (0.320)	0.104*** (0.028)
Year 2007	0.638*** (0.058)	2.148*** (0.215)	4.316*** (0.579)	0.412*** (0.058)	0.462*** (0.054)	1.593*** (0.192)	3.599*** (0.560)	0.318*** (0.052)
Observations	8,424	8,424	8,424	8,424	7,258	7,258	7,258	7,258
R-squared	0.684	0.650	0.534	0.544	0.473	0.450	0.384	0.389
Number of households	5,106	5,106	5,106	5,106	4,628	4,628	4,628	4,628
HH characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Community characteristics	YES	YES	YES	YES	YES	YES	YES	YES
HH fixed effects	YES	YES	YES	YES	YES	YES	YES	YES

NOTE: Standard errors clustered at the community level; *** p<0.01, ** p<0.05, * p<0.1; Household characteristics included in the regressions are household head characteristics (male, age, age squared, marital status), household size, number of children, own farm land, own house, and household living conditions (single unit house, outer wall masonry, source of drinking water, own toilet, gas/electric stove, number of rooms, electricity, TV, no fridge, waste and trash around house, type of floor). Community characteristics included in the regressions are distance to bus stop/terminal/pier, distance to district capital, availability of public motorized transport, and asphalt main road. A dummy variable for rural and dummies for Sumatra and Outer Islands along with their interactions with rural are included. Dummy variables are also included for missing value imputations for household per capita expenditure, quantity and frequency of Raskin purchases by the household, and the number of Raskin community distributions.

Table A5: Fixed effects results for Raskin participation using bottom 25 percent per capita expenditure (PCE) poverty classification

VARIABLES	1. Any purchase		2. Log quantity purchased (kg)		3. Purchase frequency		4. HP-CD ratio	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff
Log PCE	-0.016 (0.021)	-0.071*** (0.022)	-0.051 (0.072)	-0.240*** (0.078)	-0.131 (0.200)	-0.564*** (0.212)	-0.013 (0.018)	-0.052*** (0.020)
Bottom 25% PCE	0.008 (0.025)	-3.448*** (0.393)	0.007 (0.089)	-11.925*** (1.469)	-0.045 (0.236)	-27.468*** (4.208)	-0.003 (0.021)	-2.476*** (0.375)
Log PCE*Bottom 25% PCE		0.290*** (0.033)		1.001*** (0.124)		2.301*** (0.354)		0.207*** (0.032)
Year 2007	0.559*** (0.039)	0.522*** (0.039)	1.910*** (0.142)	1.781*** (0.140)	4.027*** (0.407)	3.732*** (0.398)	0.374*** (0.040)	0.347*** (0.039)
Observations	15,682	15,682	15,682	15,682	15,682	15,682	15,682	15,682
R-squared	0.588	0.611	0.558	0.580	0.456	0.476	0.461	0.482
Number of households	9,290	9,290	9,290	9,290	9,290	9,290	9,290	9,290
HH characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Community characteristics	YES	YES	YES	YES	YES	YES	YES	YES
HH fixed effects	YES	YES	YES	YES	YES	YES	YES	YES

NOTE: Standard errors clustered at the community level; *** p<0.01, ** p<0.05, * p<0.1; Household characteristics included in the regressions are household head characteristics (male, age, age squared, marital status), household size, number of children, own farm land, own house, and household living conditions (single unit house, outer wall masonry, source of drinking water, own toilet, gas/electric stove, number of rooms, electricity, TV, no fridge, waste and trash around house, type of floor). Community characteristics included in the regressions are distance to bus stop/terminal/pier, distance to district capital, availability of public motorized transport, and asphalt main road. A dummy variable for rural and dummies for Sumatra and Outer Islands along with their interactions with rural are included. Dummy variables are also included for missing value imputations for household per capita expenditure, quantity and frequency of Raskin purchases by the household, and the number of Raskin community distributions.

Table A6: Fixed effects results for Raskin participation using bottom 35 percent per capita expenditure (PCE) poverty classification

VARIABLES	1. Any purchase		2. Log quantity purchased (kg)		3. Purchase frequency		4. HP-CD ratio	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff
Log PCE	-0.008 (0.021)	-0.099*** (0.023)	-0.022 (0.073)	-0.336*** (0.080)	-0.007 (0.195)	-0.758*** (0.209)	-0.004 (0.018)	-0.072*** (0.019)
Bottom 35% PCE	0.022 (0.023)	-3.620*** (0.354)	0.064 (0.083)	-12.606*** (1.317)	0.206 (0.221)	-30.064*** (3.836)	0.016 (0.019)	-2.717*** (0.334)
Log PCE*Bottom 35% PCE		0.299*** (0.029)		1.042*** (0.110)		2.489*** (0.318)		0.225*** (0.028)
Year 2007	0.552*** (0.039)	0.515*** (0.039)	1.883*** (0.140)	1.754*** (0.138)	3.912*** (0.394)	3.604*** (0.384)	0.365*** (0.039)	0.338*** (0.038)
Observations	15,682	15,682	15,682	15,682	15,682	15,682	15,682	15,682
R-squared	0.588	0.617	0.558	0.586	0.456	0.484	0.462	0.490
Number of households	9,290	9,290	9,290	9,290	9,290	9,290	9,290	9,290
HH characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Community characteristics	YES	YES	YES	YES	YES	YES	YES	YES
HH fixed effects	YES	YES	YES	YES	YES	YES	YES	YES

NOTE: Standard errors clustered at the community level; *** p<0.01, ** p<0.05, * p<0.1; Household characteristics included in the regressions are household head characteristics (male, age, age squared, marital status), household size, number of children, own farm land, own house, and household living conditions (single unit house, outer wall masonry, source of drinking water, own toilet, gas/electric stove, number of rooms, electricity, TV, no fridge, waste and trash around house, type of floor). Community characteristics included in the regressions are distance to bus stop/terminal/pier, distance to district capital, availability of public motorized transport, and asphalt main road. A dummy variable for rural and dummies for Sumatra and Outer Islands along with their interactions with rural are included. Dummy variables are also included for missing value imputations for household per capita expenditure, quantity and frequency of Raskin purchases by the household, and the number of Raskin community distributions.

Table A7: Fixed effects results for Raskin participation using bottom 40 percent per capita expenditure (PCE) poverty classification

VARIABLES	1. Any purchase		2. Log quantity purchased (kg)		3. Purchase frequency		4. HP-CD ratio	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff	Coeff
Log PCE	-0.007 (0.022)	-0.110*** (0.024)	-0.020 (0.076)	-0.373*** (0.085)	0.034 (0.199)	-0.802*** (0.219)	0.000 (0.018)	-0.076*** (0.020)
Bottom 40% PCE	0.023 (0.025)	-3.513*** (0.342)	0.066 (0.090)	-12.041*** (1.268)	0.279 (0.239)	-28.368*** (3.683)	0.024 (0.023)	-2.586*** (0.320)
Log PCE*Bottom 40% PCE		0.288*** (0.028)		0.986*** (0.104)		2.333*** (0.301)		0.213*** (0.026)
Year 2007	0.551*** (0.040)	0.517*** (0.040)	1.881*** (0.144)	1.767*** (0.143)	3.877*** (0.397)	3.607*** (0.388)	0.361*** (0.038)	0.337*** (0.037)
Observations	15,682	15,682	15,682	15,682	15,682	15,682	15,682	15,682
R-squared	0.588	0.616	0.558	0.584	0.456	0.482	0.462	0.488
Number of households	9,290	9,290	9,290	9,290	9,290	9,290	9,290	9,290
HH characteristics	YES	YES	YES	YES	YES	YES	YES	YES
Community characteristics	YES	YES	YES	YES	YES	YES	YES	YES
HH fixed effects	YES	YES	YES	YES	YES	YES	YES	YES

NOTE: Standard errors clustered at the community level; *** p<0.01, ** p<0.05, * p<0.1; Household characteristics included in the regressions are household head characteristics (male, age, age squared, marital status), household size, number of children, own farm land, own house, and household living conditions (single unit house, outer wall masonry, source of drinking water, own toilet, gas/electric stove, number of rooms, electricity, TV, no fridge, waste and trash around house, type of floor). Community characteristics included in the regressions are distance to bus stop/terminal/pier, distance to district capital, availability of public motorized transport, and asphalt main road. A dummy variable for rural and dummies for Sumatra and Outer Islands along with their interactions with rural are included. Dummy variables are also included for missing value imputations for household per capita expenditure, quantity and frequency of Raskin purchases by the household, and the number of Raskin community distributions.

We evaluate household participation in the Indonesian Raskin program, a national rice price subsidy program for the poor. Using a household panel from the 2000 and 2007 rounds of the Indonesian Family Life Survey (IFLS), we evaluate program participation over the duration of the year prior to the 2007 survey using four different measures of participation. We find that although the poor as a whole are likely to have higher levels of participation compared to the non-poor, program participation is regressive among the poor. The poorest households are less likely to purchase Raskin rice over the course of a year, and conditional on participation, they are likely to purchase lower quantities of rice, purchase rice with lower frequency, and have lower participation relative to the number of community distributions. We also find that this regressive participation among the poorest households is more severe in urban areas.



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