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Cash or In-kind Transfers? Evidence from a Randomised Controlled Trial in Delhi, India

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ABSTRACT *This article examines a randomised intervention in Delhi, India, that provided unconditional cash transfers to a group of households as a replacement for the food security offered by a below-poverty-level card. The experimental approach can differentiate beneficial effects due to either unconditional cash transfers or newly opened bank accounts. The unconditional cash transfer does not induce a decline in food security; rather, it provides opportunities for households to shift to other nutritious options in non-cereal product categories.*

1. Introduction

In recent years, cash transfer programmes have become increasingly popular in many developing countries. Such a programme provides a modest, regular amount of money, as cash paid to an individual or family, to supplement any income the person or household may earn. The positive effects of the conditional cash transfer programme Oportunidades (formally PROGRESA) in Mexico have prompted many policymakers to consider the feasibility and desirability of (conditional) cash transfers as a mechanism for reducing poverty, improving health and increasing school enrolment. Thus a growing number of governments are introducing transfer schemes for some sectors of their populations, and several have expanded them to national levels. In addition, various multilateral and bilateral donor agencies actively support experimental cash transfer schemes in various parts of the world.

Existing research provides some evidence that cash transfers help reduce extreme poverty. Yet many questions remain regarding how cash transfers work and what their ultimate effects are (Gaarder, 2010). In particular, it is unclear whether cash transfers really improve health outcomes, and only limited evidence suggests the impact of cash transfers on school achievements (Garcia & Hill, 2010). Perhaps the most controversial issue relates to the issue of conditionality, that is, whether cash transfers should be conditional on households' compliance with a set of conditions or if they should be unconditional. Most research suggests that conditional cash transfers are more effective for reducing poverty than unconditional cash transfers, yet most of these studies focus mainly on improving school enrolment rates in Latin America (Baird, McIntosh, & Ozler, 2011). Preliminary results reported by Haushofery and Shapiroz (2013) from a study in western Kenya between 2011 and

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2012 suggest instead that unconditional cash transfers have substantial positive effects in terms of poverty reduction.

A closely related issue pertains to whether welfare programmes should offer in-kind transfers or cash transfers. In many countries, welfare transfers are in-kind, granted in different ways, such as provisions for health care, housing, childcare or food. In India for example, food security for the poor is assured by the government through the Public Distribution System (PDS), which grants households that fall below the poverty line (BPL) a card that they can use to buy rice, wheat, sugar and kerosene at subsidised prices in so-called ration shops.

A cash-based welfare transfer has some obvious advantages: If markets fail, (unconditional) cash transfers do not limit households to a certain type of expenditure, so in principle, they should improve social welfare for the society as a whole, more so than conditional or in-kind welfare transfers (Cunha, 2014; Feirrera, 2009). Moreover, cash-based welfare transfers have the virtue of being easier to administer than an in-kind welfare transfer, which is especially important in countries with weak institutional capacities to implement transfer programmes, such as in most sub-Saharan African countries and many Asian countries. In India, Dutta and Ramaswami (2001) caution about the significant leakages from PDS. However, welfare transfers in the form of cash also may induce moral hazards or expenditures on so-called temptation goods, such as alcohol, tobacco and gambling. The main reason many governments provide welfare transfers in-kind is their sense of paternalism (Currie & Gahvari, 2008). Paternalistic governments prefer to induce increased consumption of certain types of goods, so they provide in-kind transfers. Welfare transfers in-kind also can help ensure that individual purchase decisions match both individual and societal preferences. If a particular decision, such as to pursue an education, affects wider society, but the person makes decisions solely on the basis of his or her individual preferences, underinvestment might occur at the societal level.

This article seeks to extend the discussion of welfare transfers in-kind versus in cash. Dutta, Howes, and Murgai (2010) compare two such Indian welfare programmes and find that the cash transfer programme is more efficacious, in terms of progress and targeting. However, a local newspaper (Cherian, 2013) also has challenged the replacement of the PDS with a cash-transfer scheme. The ensuing public debate led to some requests for the judiciary to intervene, to stop any dilution of the PDS with cash transfers. Proponents of cash transfers cited economic theory and empirical studies demonstrating leakage and corruption in the PDS; opponents expressed fears that the money would be misused to buy temptation goods. Yet neither side had access to systematic evidence about the outcomes. This article examines, for the first time, the impact of cash transfers in lieu of PDS with a randomised intervention in Delhi, India; the focal experiment provided cash transfers to a random selection of BPL households.

The results reveal that replacing an in-kind welfare transfer with a welfare transfer in cash does not decrease food security. As mentioned, a common criticism of cash transfers is that households spend less on food and more on other things, which could lead to a loss of nutrition and harmful long-term effects, especially among children. Our study provides no evidence along these lines. Rather, we find that cash transfers provide opportunities for households to shift to other nutritious options in non-cereal product categories, whereas the BPL card primarily subsidises cereal items, such as rice and wheat. With the cash transfer, BPL households can increase their intake of other nutritious food items, such as pulses, milk, egg, fish, meat, fruits and vegetables. In line with Cunha (2014), who examines the Mexican food assistance programme *Programa de Apoyo Alimentario* (PAL), we also find no evidence that poor households use cash transfers in socially detrimental ways. These positive outcomes, coupled with the comparative ease of targeting and reduced leakage through cash transfers, should encourage governments to introduce such welfare programmes when possible.

The remainder of this article is structured as follows: Section 2 contains a brief theoretical discussion of welfare transfers in-kind versus welfare transfers in cash. After we explain the experimental set-up in Section 3, we provide descriptive statistics in Section 4. Section 5 outlines our methodology; Section 6 contains the main results. Finally, we conclude in Section 7.

2. Welfare Transfers In-Kind Versus in Cash

In addition to the general advantages and disadvantages of cash transfers, different types could have differential effects. For example, some cash transfers are targeted on the basis of income, usually intended for 'the poor' only; other schemes provide cash to all, regardless of their recorded income or activity status. Both systems have drawbacks.[1] Because the different types of cash transfers are beyond the scope of this investigation, we do not offer an overall survey of cash transfers here. Instead, we study the effects of substituting a cash transfer for a food subsidy, in this case, the BPL card. Arguing that the food subsidy is similar to an in-kind welfare transfer, we compare the impact of an in-kind transfer with that of a cash transfer.

In our experiment (see Figure 1), we assume that the subsidy, or in-kind transfer, refers to cereals. For all other commodities and services, no subsidy (or in-kind welfare transfer) is available. The horizontal axis in Figure 1 measures the consumption of cereals, and the vertical axis measures the consumption of all other commodities and services (composite commodity, money, numeraire good). The figure compares the post-transfer situations for in-kind and cash transfers. For the BPL card (that is, in-kind transfer), the consumer starts with A units of money; by buying cereals, she travels along the kinked budget line ABC. For the first few units of cereals, she pays a lower price, as given by the slope of the segment AB. This low price is a subsidised price for people entitled to buy from the ration shops. However, after the consumer has bought an amount b of cereal, she is not entitled to this low price anymore; if she wants to consume more cereal, she must pay the higher market price. Thus in Figure 1, segment BC is steeper than AB. The changing price of cereals beyond b produces the kink at B.

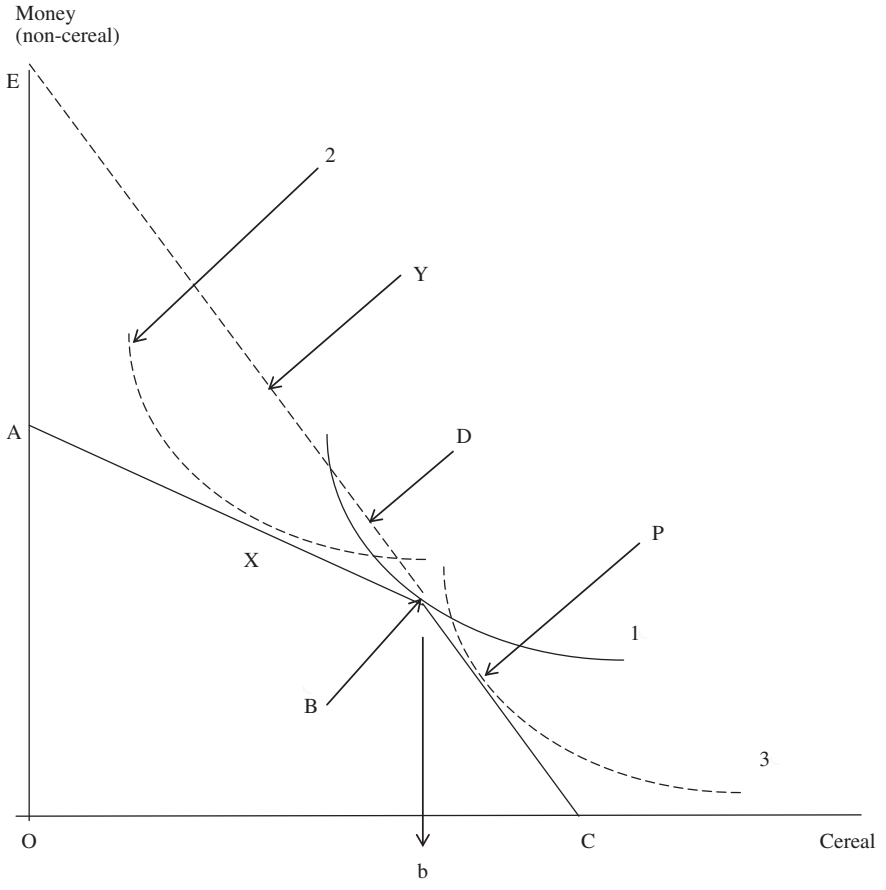

Figure 1. Impact of a cash transfer.

In our experiment, when the BPL card is replaced by an unconditional cash transfer, the consumer's budget line changes from *ABC* and starts to look more like a conventional, textbook version, *EBC*. Removing the food subsidy and providing a cash transfer instead moves the consumer's budget line to *EBC*. This change to the budget line enables the consumer to purchase a basket *B* both before and after the treatment. Unconditional cash is weakly preferred to the in-kind transfer. Moreover, the difference between what the consumer bought before the treatment and what she purchases after the treatment depends crucially on the initial purchase (that is, whether the consumer was to the left or right of B). Suppose that the consumer's indifference curve (iso-utility line) is 3, which is tangential to the segment *BC* at *P* and is the highest such curve that the consumer can reach and still appear on the budget line *ABC*. When we change her budget line to *EBC*, 3 continues to be her highest attainable indifference curve (that is, greatest utility level), so she stays at *P*. That is, she remains where she was before the treatment. However, for a consumer 2, who previously consumed at *X*, the treatment improves the utility level. This consumer moves to a new point of tangency, between the new budget line and a higher utility level at a point such as *D*. The only additional consideration is that it is entirely possible for someone to be at *B* when the budget line is *ABC* and continue there, even when it changes to 1. In that case, the curve is tangential to *EBC* at *B*.[2]

From our representation of point *Y*, it may appear that cereal consumption in *Y* is the same as that of *X*. However, theory cannot reveal – unless we know the exact preferences (or indifference map) – whether cereal consumption (that is those with curve 2) increases or decreases after the treatment. Rather, it simply suggests that 3 (that is, those with curve 3) does not change cereal consumption and 1 definitely decreases it.

Beyond this initial investigation of the data generated by the experiment, we also address the post-treatment shift in the consumption of non-cereal by consumer types 1 and 2. Do they buy more or less of non-cereal food items, or do they buy more 'bad' non-cereal items, such as alcohol and gambling?

Finally, we note that in our experiment, the cash transfer went automatically into a bank account. Opening a bank account could have beneficial effects by itself, beyond the individual welfare-increasing effects of the cash transfer, by initiating a process of ensuring access to financial services among the poor. Vast literature emphasises the advantages of obtaining access to financial services (for example, savings, loans, insurance, credit, payments). By providing these financial services, the financial sector can effectively help the poor escape poverty, such as when loans increase their level of consumption and minimise risk. Therefore, we ensure that our experiments differentiate between the effects of the cash transfer and the outcomes of opening a bank account. Before presenting these effects, we explain our experimental design.

3. Experimental Design

The unconditional cash transfer (CT) experiment started in mid-2010 in Raghubir Nagar (West Delhi). Delhi is a large city, with a food supply infrastructure that is much better organised than in many cities in India. This location was purposeful, because in our effort to observe changes in household behaviour, we did not want households to feel restricted in their access to alternative food supply sources. Conducting the experiment in Delhi ensured that respondents had easy access to private stores, in addition to ration shops.

On the other hand, the population here are representative of the general patterns regarding nutrition among the poor. For example, successive NSS (National Sample Survey) data suggest a gradual decline in calorie intakes sourced from grains.[3] The standard set for urban India was 2200 Kcals a day per adult. Almost all of it was supposed to come from cereals and grains. However, with time, various new food items have allowed people to substitute away from grain and consume more of fruits, vegetables, milk, etc. We see a similar pattern in our target group where the calorie intake from cereals, pulses, edible oils, milk and sugar is 1583 Kcals a day on the average (calculated from our own survey). The rest of the calorie intake comes from vegetables, fruits, meat and eggs (items for which quantities are difficult to get).

To find respondents, we collaborated with the Self-Employment Women's Association (SEWA) to explain the experiment to a community that spans 12 blocks of Raghubir Nagar. The awareness campaign ran for two weeks (first week of August 2010 to 13 August 2010). It initially targeted groups of 15–20 people, but because ration shop owners tried to influence people to avoid participating in the experiment, we reduced the group sizes to 5–6 people at a time, to make their participation less noticeable.

The government also would not allow any compulsory participation, in which we forced people to give up their BPL card to receive a cash transfer. Instead, we needed volunteers. Of the 690 BPL families introduced to the experiment through the awareness programme (as of 1 September 2010), 362 chose to participate, 261 decided not to participate and 67 expressed indecision. These responses came from the female head or spouse of a male head of each household. Through random selection (conducted on 5 September 2010), we identified 350 of the 362 willing households to receive cash transfers; of the 261 non-participating households, we randomly selected 150 households to investigate.

However, some families dropped out of the study because (1) the ration card is available to the entire household, and in some cases, other members of the household did not agree with the female head who agreed to participate; (2) some households were not BPL card holders and had to be excluded; and (3) some households migrated. Faced with these effects, we conducted a second round of awareness campaigns in November in the same area and identified a new group of households to participate in the experiment. Ultimately, our CT experiment included 300 volunteer households and 150 households that did not want to be involved.

A baseline survey for all 450 households included questions about the amounts they spent on various consumption items in the 30 days preceding the survey, which represents a standard method for collecting consumption data in official Indian surveys. The cereal items were rice, wheat and other cereals; the non-cereal food items were pulses and pulse products; milk and milk products; edible oil; egg, fish and meat; vegetables; fruits; tea and coffee and sugar. We measured consumption expenditures on these items for both the 30 days prior to the baseline survey and the 30 days leading in to the end-line survey.

Next, we randomly assigned the 300 participating households into three groups: (1) 100 households for whom bank accounts were opened (in the woman's name) and who were earmarked to receive an unconditional cash transfer but could not use their BPL card, which became group T (treatment); (2) 100 households for whom bank accounts were opened but that received no cash transfer, labelled C1; and (3) 100 households who received neither a bank account nor the CT, labelled C2. A fourth group, C3, comprised the 150 households that chose not to participate in the unconditional CT experiment.

Shortly after the baseline survey, the bank accounts were opened (for T and C1), and the unconditional cash transfers started. For group T, government stamps on their ration cards indicated that they could not use their rations for a year; instead, they received a monthly cash transfer of INR (Indian Rupees) 1000 (about USD 18), without any conditions on how to spend it. This money was deposited every month, starting from January 2011 and ending in December 2011, into bank accounts opened in the name of the women in the households. The amount transferred reflected the following calculation: For each item that the BPL card could be used to purchase (rice, sugar, wheat and kerosene), we took the maximum amount a family could receive, then multiplied it by the difference between the market price and the ration price to obtain the subsidy per product. We added the implied 'subsidies' for these four products to determine the total unconditional CT per family.

A second, midline survey occurred in July 2011. Although potential changes due to the cash transfer might take a year to emerge, for certain parameters, the changes may be evident even in the short term (that is, after six months). To capture those effects, we conducted the midline survey, though it also served another important purpose. Our CT intervention included an exit option for all recipients after six months, which was important because the CT replaced a public programme to which households already had access. Therefore, we gave them the option to go back to the PDS; the midline survey results indicated that only four households that received the CT (4%) did not want to continue, so they

Table 1. Sample for the CT experiment

Group	Households (Baseline)	Households (Midline)	Households (End-line)	Difference between End-line and Baseline	Reasons
T (Treatment)	100	99	94	6	Death of the beneficiary, dropouts after six months
C_1 (Control 1)	100	99	97	3	Address not traceable
C_2 (Control 2)	100	91	91	9	Address not traceable
C_3 (Control 3)	150	140	136	14	Address not traceable
Total	450	429	418	32	

dropped out of the analysis. We also considered the households that originally did not want the intervention (C3 group); 22 per cent of this group requested the cash transfer in the midline survey. However, we kept those households in group C3. Overall, the numbers suggest that over time, the number of households that sought to leave the T group was less than the number that wanted into that group, which could be a demonstration effect.

Finally, our end-line survey was carried out in January 2012. Although we had started with 450 households, the numbers fell to 429 in the midline survey and 418 by the end-line survey, for the reasons listed in Table 1.

During the end-line survey, we again asked households if they wanted the cash transfer to continue or start (if they had not received it previously). The results were in line with the midline survey: A substantial majority of those who received the cash transfer wanted to continue, and around 20 per cent of those who did not voluntarily opt for the cash transfer wanted to join by the end of the programme.

We tested whether the attrition was random, by estimating a logit model that explained attrition using a vector of baseline variables (Table 2). When regressing dropouts on a vector of baseline

Table 2. Characteristics of dropouts and respondents

Independent variables (X)	Coefficients
Self-employed	0.96
	(0.61)
Regular salary employed	0.65
	(0.54)
Primary	0.49
	(1.09)
Secondary	0.17
	(1.13)
Dependent	0.73
	(1.32)
House ownership	0.59
	(0.90)
Other scheme	−0.33
	(0.53)
Household size	−0.13
	(0.11)
Observations	300
Log-pseudo likelihood	−68.28
Pseudo R-squared	0.035

Notes: Robust standard errors are in parentheses. The regression results refer to a logistic regression, where Y = 1 if the household remained in the sample (281 out of 300), and Y = 0 if it left (19 out of 300).

controls, we found no significant variables, suggesting there is little reason to anticipate that our statistical results might be compromised by non-random attrition biases.

The Online Appendix provides definitions for all the variables and their names.

4. Characteristics of Households in the Sample

Our experiment focuses on the sample of households that was willing to replace an in-kind welfare transfer (BPL card) with an unconditional cash transfer. Because we are observing self-selected households, self-selection bias should not be a problem, and internal validity should be guaranteed. However, it may be relevant to test if the randomised selection produced balanced groups. We conducted Kolmogorov-Smirnov tests of the equality of the distribution functions of the main variables in our analysis (Table 3). This statistic tests the null hypothesis that the groups were sampled from populations with identical distributions.

According to Table 3, the groups of self-selected households are similar, such that randomisation apparently resulted in balanced groups. Only in case of *PCnonfood* the test suggests baseline differences between C1 and C2. Since, this only holds for one of the variables this does not invalidate our randomisation.[4] We also compared the characteristics of the self-selected households and households that did not want to take part. Even for this comparison, for nearly all the variables, we found no differences between households that self-selected for the CT and households that initially did not want a CT (group C3). These results may not come as a surprise; all the households in our experiment are below the poverty line and live close to one another. Thus there is no reason to expect substantial differences in their observational characteristics across groups.

The majority of these households included self-employed or regular wage earners; a minority relied on casual labour (defined as non-permanent labour, with no fixed employer or contract from any single employer) for their income. Casual labourers, such as daily workers or 'handymen', often work much longer hours than do regular salary or wage earners. In addition, the average household size in the sample was around 5.5 people. Table 4 provides some baseline descriptive statistics for the main variables in our analyses.

Table 3. Balancing test between groups

Ho(Null): There is a difference in the distribution of x across two groups	Groups		
	T & C1	T & C2	C1 & C2
Outcome variables in baseline			
PCCalories	Null rejected	Null rejected	Null rejected
PCCereal	Null rejected	Null rejected	Null rejected
PCNoncerealexp	Null rejected	Null rejected	Null rejected
PCintoxicantexp	Null rejected	Null rejected	Null rejected
PCnonfood	Null rejected	Null rejected	Null Accepted
Exogenous variables in baseline			
Hhsize	Null rejected	Null rejected	Null rejected
Dependent	Null rejected	Null rejected	Null rejected
Self-employed	Null rejected	Null rejected	Null rejected
Regular salary employed	Null rejected	Null rejected	Null rejected
Casual labour	Null rejected	Null rejected	Null rejected
Houseownership	Null rejected	Null rejected	Null rejected
Otherscheme	Null rejected	Null rejected	Null rejected
Primary	Null rejected	Null rejected	Null rejected
Secondary	Null rejected	Null rejected	Null rejected
Abovesecondary	Null rejected	Null rejected	Null rejected

Notes: Two-sample Kolmogorov-Smirnov test for the equality of the distribution functions at 5 per cent significance level.

Table 4. Descriptive statistics measured at the baseline

a. Numbers.

Name	Observations	Mean	Median	Standard Deviation
PCCalories Kilo calories (Kcal)				
T	94	47480	42979	23004
C1	97	43954	42037	13446
C2	91	47398	42667	21908
PCCereal (Kilo calories (Kcal)				
T	94	27865	25000	13831
C1	97	24840	23809	8078
C2	91	27553	25000	13201
PCNoncereal (Kilo calories (Kcal)				
T	94	19571	17515	10322
C1	97	18959	17707	7676
C2	91	19655	17208	10154
PCNoncerealexp Indian rupees (INR)				
T	94	472	422	241
C1	97	466	424	232
C2	91	468	422	244
PCintoxicantexp Indian rupees (INR)				
T	94	16	00	69
C1	97	25	00	70
C2	91	10	00	52
PCnonfood Indian rupees (INR)				
T	94	924	778	598
C1	97	1044	950	586
C2	91	866	796	485
Hhsize				
T	94	5	5	2
C1	97	6	5	2
C2	91	5	5	2
Dependent				
T	94	0.20	0.16	0.22
C1	97	0.17	0.11	0.24
C2	91	0.21	0.16	0.26

b. Percentages

	T	C1	C2
Household type per group			
Self-employed	44	36	43
Regular salary employed	34	39	30
Casual labour	15	22	23
Other	7	3	4
Education household head			
Primary	78	62	68
Secondary	19	36	30
Abovesecondary	3	2	2

5. Methodology

Our analysis seeks to determine the impact of the CT and the bank account. If groups C1, C2 and T are statistically identical, an end-line comparison of C1 and T would reveal the effect of the cash transfer; an end-line comparison of C2 and T would indicate the impact of the cash transfer and the opening of the bank account; and a comparison of C1 and C2 would indicate the impact of the bank account opening. Because we could not force poor households to participate, we deliberately focused on

households that self-selected for the programme, which ensures that the internal validity of our impact estimates is high. Thus our experiment does not provide an average treatment effect; the impact we find refers specifically to the impact on those who actually accept the treatment.

Due to the randomised assignment process, the self-selected cash transfer groups (T, C1 and C2), in theory, should be statistically equivalent in their observable and unobservable characteristics, such that all differences across T, C1 and C2 in the end-line survey should be due to the cash transfer and/or bank account opening. The analysis of the baseline data, using equality tests for observable variables, suggests that the three groups are similar, which offers evidence of the reliability of our approach to measure impacts by comparing end-line values. However, because the randomised assignment process applies to a relatively small sample, some differences in unobservable characteristics may still exist. For this reason, we use various estimation techniques, all of which should provide unbiased estimates.

First, we estimate standard ordinary least square (OLS) models, as follows:

$$Y_i = \vartheta + \alpha C_{1i} + \beta C_{2i} + \sum_j \delta_j X_{ij,-1} + e_i \tag{1}$$

Where Y_i is a vector of outcome variables for individual i measured at the end-line; X_{ij} is a vector of j covariates measured at the baseline; C_1 and C_2 are dummies for the groups; α measures the difference between T and C_1 to provide the effect of the unconditional CT; and β gives the difference between T and C_2 and refers to the combined effect of the unconditional CT and opening a bank account. Positive values for α (and β) suggest that the unconditional cash transfer (the total effect of CT and bank account) decreases. The comparison of α and β reveals the impact of opening the bank account. With our small sample, we include the control variables, measured in the baseline survey, to increase the precision of our estimates and control for any remaining differences across groups.

Because we have access to baseline and post-treatment data, we can improve on the OLS model by estimating a fixed effects model that also controls for unobservable variables that do not change over time. For greater precision, we again add control variables. Moreover, we include a time dummy to control for time effects. This model is specified as follows:

$$Y_{it} = \vartheta_i + \alpha_1 C_{1i} * post_t + \beta_i C_{2i} * post_t + \theta post_t + \sum\nolimits_j \delta_j X_{ijt} + u_{it} \tag{2}$$

where $post_t$ is a time dummy, equal to 1 at the end-line and 0 at the baseline. We interact the 'group' dummies with *post* to ensure that the interaction terms take values equal to 1 only after the treatment. Equation (2) also assumes fixed effects at the individual level; in an alternative specification, we took fixed effects at the group level instead. This specification reflects the double difference estimator used by Karlan and Valdivia (2011) and provides results similar to those achieved by the fixed effects regression, in line with Equation (2).

Finally, as a robustness test, we estimated an analysis of covariance (ANCOVA) model and regressed the outcome variables (measured at the end-line) on the cash transfer dummies and the lagged outcome variable:

$$Y_i = a + b_1 C_{1i} + b_2 C_{2i} + c Y_{i,-1} + u_i \tag{3}$$

The ANCOVA estimates offer more power than difference-in-difference (or fixed effects) regressions, which may be important for our relatively small sample.

6. Results

In line with our previous explanation and Figure 1, our analyses focus on (1) the impact of the CT on cereal consumption and (2) the post-treatment adjustment in the consumption of non-cereal items. The

main question thus is whether households buy more or less non-cereal food items or buy more 'bad' non-cereal items like alcohol.

6.1. Food Security

To measure food security, we focus on the quantity of food consumed. Simply taking average expenditures on food items cannot give a clear picture of the welfare of a household, because some households obtain their staple food from PDS but get other food from open sources, and some households simply buy all food items from an open source. We therefore seek to convert the quantity of food intake to a verifiable, common metric of nutritional quality. One widely accepted measure is the calorie value of food items. We anticipate that the calorie value of the food consumed likely is affected by the substitution of cash transfers, and we use the ICMR (Indian Council of Medical Research) calorie conversion chart for this measure. Because each household received INR 1000, in lieu of the PDS, we also considered whether these households were able to consume as much food (with CT) as they did before (with PDS). With this cash amount though, some consumers might choose a different consumption basket, such that compared with the pre-CT consumption basket, the consumption of some items increases while the consumption of others decreases. Mapping these items to their caloric value helps us compare heterogeneous consumption baskets. That is, we test the hypothesis that the per capita calorie intake of households in treatment group T is no lower than that in the control group households.

From Figure 1, we already know that treated consumers may reduce their intake of cereals, that is, the items distributed through ration shops. They also could increase their non-cereal food consumption in a manner that overcomes the reduced nutrition sourced from cereals. This is an empirical question.

In Tables 5, 6 and 7 we present the regression results obtained from Equations (1), (2) and (3), respectively. The first columns reveal the impact of the unconditional CT on calories consumed, measured by the 'per capita total calories consumed from cereals (rice, wheat and other cereals like jawar, bajra and maize) and non-cereals (pulses and pulse products; milk and milk products; edible oil and sugar) for which quantities are available' (*PCCalories*). The results are insignificant for C1 and C2, across the different estimation techniques; that is, the cash transfer does not reduce calorie consumption. The coefficients for C1 and C2 do not differ significantly (Wald tests for Tables 5, 6 and 7 are available in the Online Appendix, Tables A1, A2 and A3), which indicates there is no additional impact of opening a bank account. A common criticism of cash transfers is that households will spend less on food and more on other things, leading to nutrition losses and harmful long-term effects, especially for children. The regression results indicate that this fear is probably unfounded.

Similarly, Shaw and Telidevara (2014) find no compromise of food security for people who do not hold the ration card compared with those with such a card, based on their national-level analysis of BPL households in rural India. Those authors used NSSO 2004–2005 consumption data and compared BPL households with access to a ration card and those without such access. Their results show that people with ration cards meet their calorie requirements by consuming more cereals than non-cereals.

6.2. Change in Consumption Patterns: Impact of CT on Cereal and Non-Cereal Consumption

We next check whether the households in our sample, in line with Shaw and Telidevara (2014), shift from cereals to non-cereals. Some people may respond to a price subsidy in hand (that is, CT) by switching away from nutritious staples to purchasing in the non-cereal segment, to add more taste or variety to their diets. Here, we consider two possibilities: households decrease their cereal consumption and instead substitute increased non-cereal consumption, which is a *substitution effect* on cereals, or household cereal consumption remains the same but the members start consuming more non-cereals because of the household's increased purchasing power, which represents an *income effect* on non-cereals. The cereal group comprises items such as rice, wheat, maize, jawar, bajra and ragi; the non-cereal category consists of other nutritious food such as pulses, milk, eggs, fish and meat, fruits and vegetables.

Table 5. OLS regression

Outcome (dependent) Variables (Y)					
	Kilo calories (Kcal)		Indian Rupees (INR)		
	PCCalories	PCCereal	PCNoncerealexp	PCintoxicantexp	PCnonfood
Independent variables	(1)	(2)	(3)	(4)	(5)
C_1	−1300.90	864.40	−137.70***	4.56	−91.38
	(2821.54)	(1716.09)	(44.96)	(9.30)	(186.37)
C_2	−2707.36	199.07	−143.63***	3.05	−245.61**
	(3067.01)	(1991.69)	(44.27)	(9.24)	(125.66)
Self-employed	−10104.93***	−7424.46***	−47.54	−14.44	−99.50
	(3651.28)	(2310.96)	(43.33)	(9.17)	(191.55)
Regular salary employed	−3945.26	−3223.96	16.22	2.20	−153.59
	(3382.61)	(2180.81)	(41.69)	(11.83)	(151.23)
Primary	−7277.81	−1958.97	−288.75*	19.79	−565.55
	(5371.19)	(3457.26)	(174.42)	(8.81)	(698.75)
Secondary	−956.94	537.11	−140.20	25.73	−306.42
	(5549.96)	(3555.10)	(176.23)	(10.22)	(702.87)
Dependent	25780.48***	13959.30***	330.18***	−6.63	−202.18
	(7509.17)	(4933.12)	(76.15)	(19.61)	(244.15)
House ownership	−86.98	−62.35	−1.19	0.29	−4.22***
	(130.76)	(86.88)	(1.08)	(0.46)	(1.29)
Other scheme	6016.89*	3394.94	52.01	−0.84	191.86
	(3239.53)	(2073.29)	(40.51)	(8.34)	(190.68)
Constant	55686.11***	29594.57***	886.31***	0.71	1701.59**
	(6062.34)	(3988.38)	(184.44)	(9.39)	(793.70)
Observations	282	282	282	282	282
R-Squared	0.184	0.165	0.185	0.023	0.0357

Notes: Robust standard errors are in parentheses.
***Coefficients significant at 1 per cent, **5 per cent, *10 per cent.

In the second columns in Tables 5–7, we find differences in the per capita calories consumed as cereal between the C1 and T groups. The coefficient for C1 in the regression explaining 'per capita calories consumed from cereals' (*PCCereal*) is positive, and significant in the fixed effects regression, which suggests that the shift to a cash transfer leads to a decline in cereal consumption. We also conducted regressions for the three main categories of cereals (rice, wheat and other); their results, presented in tables A4–A6[5] in the Online Appendix, suggest that the decline in cereal consumption is due mainly to a decline in wheat consumption. However, across all estimation methods, the consumption of other cereals also is positively affected by the shift to the cash transfer.

The Tables 5–7 also suggest that unconditional CT induce greater per capita expenditures on non-cereals. The coefficients for C1 and C2 in the regressions explaining 'per capita expenditure on non-cereal food items' (*PCNoncerealexp*; third column in Tables 5–7) are always negative and significant. Because the non-cereal segment contains such heterogeneous products, it is difficult to gain a clear idea of the quantities consumed.[6] Therefore, we present the impacts in terms of monetary values (Indian rupees).

6.3. Change in Consumption of Alcohol or Non-Food Items

The analysis so far suggests that unconditional CTs do not disrupt food security. Other arguments against these welfare methods indicate concerns that consumers might spend cash transfers on private 'bad' goods, such as alcohol, that can be detrimental to the individual's health and have negative impacts on family welfare. To test these potential effects, we measure 'per capita expenditure on alcohol' (*PCintoxicant*). Yet we find no significant differences across groups (see column 5 in

Table 6. Fixed effects regression

Outcome (Dependent) Variables (Y)					
	Kilo calories (Kcal)		Indian Rupees (INR)		
	PCCalories	PCCereal	PCNoncerealexp	PCintoxicantexp	PCnonfood
Independent variables	(1)	(2)	(3)	(4)	(5)
C_1	2692.06	4127.04**	−126.88***	−1.31	−210.66
	(2424.38)	(1743.47)	(41.69)	(11.50)	(154.26)
C_2	1989.95	3150.61	−90.63**	9.01	−151.63
	(2765.02)	(2010.80)	(40.52)	(10.35)	(121.88)
Post	1483.77	−1510.92	247.70***	0.73	185.50*
	(2029.23)	(1543.91)	(30.21)	(9.35)	(101.15)
Regular salary	−2474.72	−2732.85	−27.51	−17.45**	227.16
Employment	(2743.08)	(1847.44)	(45.95)	(7.75)	(170.19)
Casual labour	−1258.69	−1661.37	15.46	−21.26**	92.1
	(2806.79)	(1785.13)	(50.84)	(10.90)	(145.65)
Primary	−3624.02	−3556.59	31.82	29.20	44.99
	(2745.47)	(2168.62)	(42.35)	(23.63)	(112.82)
Secondary	2268.37	2820.22	−108.51	23.54	−50.90
	(6728.95)	(4886.78)	(89.89)	(15.52)	(275.46)
Dependent	72306.70***	40024.61***	784.61***	−30.40	1153.76***
	(8578.08)	(6037.67)	(202.71)	(35.74)	(405.03)
House	68.09	115.45***	−0.39	0.35	2.42
Ownership	(50.69)	(36.53)	(0.65)	(0.27)	(1.95)
Other scheme	−3842.02	−2134.59	−79.89	−7.36	−193.19*
	(2364.35)	(1694.25)	(48.36)	(10.67)	(115.67)
Constant	36237.54***	22932.19***	288.81***	14.87	(629.31)***
	(2896.11)	(2208.19)	(63.52)	(19.21)	(158.40)
Observations	564	564	564	564	564
R-Squared within	0.305	0.216	0.398	0.034	0.051

Notes: Robust standard errors are in parentheses. ***Coefficients significant at 1 per cent, **5 per cent, *10 per cent.

Table 7. ANCOVA regression

Outcome (Dependent) Variables (Y)					
	Kilo calories (Kcal)		Indian Rupees (INR)		
	PCCalories	PCCereal	PCNoncerealexp	PCintoxicantexp	PCnonfood
Independent variables	(1)	(2)	(3)	(4)	(5)
C_1	885.33	2388.21	−125.20***	4.25	−139.81
	(2602.73)	(1659.87)	(43.17)	(9.07)	(149.70)
C_2	−2245.19	465.47	−133.40***	6.05	−210.75*
	(2553.23)	(1777.43)	(41.84)	(8.60)	(117.97)
Outcome variable in baseline	0.59***	0.53***	0.45***	0.36	0.54***
	(0.10)	(0.13)	(0.08)	(0.12)	(0.17)
Constant	23017.63***	12890.56***	503.19***	8.48***	623.05***
	(4903.97)	(3616.21)	(48.75)	(5.96)	(168.54)
Observations	282	282	282	282	282
R-Squared	0.305	0.226	0.169	0.1291	0.100

Notes: Robust standard errors are in parentheses.
***Coefficients significant at 1 per cent, **5 per cent, *10 per cent.

Tables 5–7). These results suggest that unconditional CT do not increase consumption of alcohol, in line with Haushofery and Shapiroz (2013)

Finally, we study the impact on 'per-capita expenditure on non-food items' (*PCnonfood*), such as electricity, cooking fuel, clothing, footwear, education or entertainment, as we show in column 5 of Tables 5–7. In none of the tables, C1 is significant, suggesting that the shift to the cash transfer does not affect expenditures on non-food items. However, C2 is significantly below zero for the OLS regression and the ANCOVA specification, so there may be some positive impact of opening a bank account on expenditures on non-food items.[7]

7. Conclusion

This article has presented the results of a cash transfer (CT) experiment in Delhi. The pilot CT identified a group of households that would receive direct, unconditional cash transfers in lieu of their existing food security methods, which were based on a PDS. In India, the PDS system provides BPL households with ration cards they can use to buy food and fuel at subsidised prices. We argue that the PDS system is similar to an in-kind welfare transfer; in this sense, our experiment provides new evidence to advance the discussion of in-kind welfare transfers versus welfare transfers in the form of cash. The experiment, conducted in Raghubir Nagar (West Delhi), assesses the implications of CT on BPL households; it also features a baseline survey, a midline survey and an end-line survey.

A primary concern associated with cash transfers, instead of in-kind transfers, is that food security may suffer, or that households might indulge in wasteful expenses. While there are no serious statistical estimates of alcohol consumption among the poor, there are anecdotes of excessive alcohol consumption among them (for example, see Jain, 2014). Our study is a rigorous attempt to address this specific issue. We find that with CT, food security is not compromised. In particular, households that received CT are no worse off than households that relied on PDS. We even find some evidence that unconditional CTs provide opportunities for households to shift to other nutritious, non-cereal options. We also test the argument that CTs might lead to wasteful expenses, but we find no statistical evidence in support of this effect. Therefore, unconditional cash transfers do not appear to compromise food security, nor do they induce households to increase wasteful expenses.

This study thus offers some support for replacing in-kind welfare transfers with unconditional cash transfers. At the least, the results suggest that providing poor households with the opportunity to choose between an unconditional cash transfer and an in-kind welfare transfer increases their welfare. Within the group of households that self-selected into an unconditional cash transfer programme, cash transfers did not seem to compromise food security or induce these households to increase their wasteful expenses.

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Notes

1. An income-targeted system must test means (proxy means testing), which may result in high Type I and Type II errors (that is, they do not reach many for whom they are intended and do reach some who are not the intended beneficiaries). They may also create poverty traps, such that anybody who increases their income to just above the threshold loses the grant and faces a

marginal 'tax' rate of up to (and even above) 100 per cent, fostering what economists call moral hazards and immoral hazards. In addition, as Ellis (2012) notes, income-targeted cash transfers may lead to social tensions between included and excluded groups.

2. One important difference between 2 and 3 on the one hand and 1 on the other is that whereas 2 and 3 are initially at a point of tangency, 1 initially appeared at the kink on the original budget line, which is not at a point of tangency.
3. NSS conducts national consumption surveys every year. Every five years, however, they conduct the survey with a larger sample size.
4. We conducted the balancing test on each individual item in 'PCnonfood' variable between C1 and C2. All the items in the group are balanced in the baseline except for personal care for men and women.
5. WALD tests for these tables are also presented in the Online Appendix, tables A7–A9.
6. In the Online Appendix, tables A4–A6 we present the impacts on people's consumption of subgroups of non-cereal food items, for which some quantity information is available. Specifically, we considered the impact of the shift to a cash transfer on quantities consumed (kilograms) for pulses, milk and edible oil. These quantity regressions (similar to those for monetary values) suggest that the CT shift increased consumption of these three important products in the non-cereal food group. Pulses appear significant in OLS and ANCOVA regressions but insignificant in the fixed effect regression for both groups C1 and C2. However, we found no additional impact of opening a bank account; C1 and C2 never differ significantly from each other.
7. The Wald test suggests that there are no differences between C1 and C2, see the Online Appendix.

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