American Economic Journal: Applied Economics 2014, 6(2): 195–230
http://dx.doi.org/10.1257/app.6.2.195

Testing Paternalism: Cash versus In-Kind Transfers[†]

By Jesse M. Cunha*

Welfare programs are often implemented in-kind to promote outcomes that might not be realized under cash transfers. This paper tests whether such paternalistically motivated transfers are justified compared to cash, using a randomized controlled trial of Mexico's food assistance program. In relation to total food consumption, the in-kind transfer was infra-marginal and nondistorting. However, the transfer contained ten food items, and there was large variation in the extent to which individual foods were extra-marginal and distorting. Small differences in the nutritional intake of women and children under in-kind transfers did not lead to meaningful differential improvements in health outcomes compared to cash. (*JEL* I14, I18, I38, O15)

Welfare transfers are often made in kind rather than in cash. In fact, the governmental provision of health care, housing, child care, and food vastly dominate cash transfers in most countries, both developing and developed (Tabor 2002; Tesliuc 2006). Transfer recipients, however, weakly prefer an equal-valued cash transfer as it offers the same, if not more, budget choices. In light of this fact, many justifications for the use of in-kind transfers have been suggested. For example, transfers in kind may induce the nonpoor to self-select out of welfare programs (Nichols and Zeckhauser 1982; Bearse, Glomm, and Janeba 2000; Blomquist, Christiansen, and Micheletto 2010); or they may facilitate pecuniary redistribution that is not achievable through cash transfers (Coate, Johnson, and Zeckhauser 1994; Cunha, De Giorgi and Jayachandran 2011); or they may be more politically feasible than cash transfers (de Janvry, Fargeix, and Sadoulet 1991; Epple and Romano 1996). Perhaps the most cited rationale for in-kind over cash transfers, however—and the one studied here—is paternalism (see Currie and Gahvari 2008 for a review of this literature).

A paternalistic government uses in-kind transfers precisely to encourage the consumption of transferred goods. For such transfers to be justified over cash, they must first affect consumption differently than would an equal-valued cash transfer; that is, they must be both extra-marginal and binding. If transfers are infra-marginal, the recipient would simply reduce market purchases one-for-one with the transferred good. If the government cannot force consumption of an extra-marginal

* Graduate School of Business and Public Policy, Naval Postgraduate School, 555 Dyer Road, Monterey, CA 93943 (e-mail: jessecunha@gmail.com). I thank Giacomo De Giorgi, Seema Jayachandran, Karthik Muralidarhan, Caroline Hoxby, Orazio Attanasio, Ned Augenblick, and Luigi Pistaferri for helpful comments. This research was funded in part by the Stanford Institute for Economic Policy Research Leonard W. Ely and Shirley R. Ely Graduate Student Fund Fellowship.

[†] Go to http://dx.doi.org/10.1257/app.6.2.195 to visit the article page for additional materials and author disclosure statement(s) or to comment in the online discussion forum.

transfer, the recipient will have an incentive to sell or trade it away. Thus, a simple model of consumer demand predicts that both infra-marginal transfers and nonbinding extra-marginal transfers with costless resale will have no differential effects on behavior than would an equal-valued cash transfer (Southworth 1945).

The magnitude of the distorting effect of in-kind transfers is of fundamental importance for policy makers, yet little credible empirical evidence exists for in-kind transfer programs. This lacuna of evidence arises from the simple fact that we can never simultaneously observe the true counterfactual behavior under an equal-valued cash transfer. In this paper, I take advantage of a unique policy experiment and demonstrate how this identification problem can be overcome through the use of detailed survey data and a randomized controlled trial in which recipients are assigned to receive either an in-kind transfer or an equal-valued cash transfer.

Specifically, comparing consumption choices under the cash transfer to how much would have been transferred in kind identifies the extent to which the in-kind transfer is extra-marginal; comparing consumption choices under the in-kind transfer to how much was actually transferred identifies the extent to which the in-kind transfer is binding; and comparing the extra-marginality of the transfer to the degree to which it is binding identifies the distorting effect of the in-kind transfer. Such comparisons would be extremely difficult to make without the random assignment of transfer type.

The program I study is the Mexican government's food assistance program, the *Programa de Apoyo Alimentario* (PAL). The stated aim of PAL is a paternalistic one—to improve food security, nutritional intake, and health (Vázquez-Mota 2004). Participating households receive monthly transfers (trucked into the villages) consisting of ten common food items, such as corn flour, beans, rice, oil, and powdered milk. Eligibility for the program was determined through a means test, and take-up among eligible households was virtually universal. Furthermore, program rules made it impossible for households to self-select into the program. These facts allow me to abstract from motivations for in-kind transfers, such as self-selection and tagging, that can be important in other contexts (Akerlof 1978; Moffitt 1983).

The experiment, designed and implemented by the Mexican government, included about 200 rural villages and was conducted during the rollout of the program in 2003. The transfer type was randomized at the village level, and eligible households received either the in-kind food transfer, an unrestricted cash transfer, or no transfer (a control). When possible, a woman (the household head or spouse of the head) was designated the beneficiary within the household. The analysis uses detailed consumption and health data that was collected from participating households and individuals both pretreatment and posttreatment. Pretreatment data confirm that the population is poor (per capita consumption is less than $2 per day) and the transfers are large (at about 12 percent of pretransfer household consumption), suggesting that both transfer types had the potential to improve welfare.

Furthermore, paternalistic motivations for in-kind transfers of nutrient rich foods are not without merit, as malnutrition among children in this population was common pretreatment; for example, 32, 47, and 41 percent of children were not consuming the Recommended Dietary Allowance (RDA) of the essential micronutrients iron, vitamin C, and zinc, respectively. However, the population in these villages tends toward being overweight (for example, 62 percent of women and 20 percent

of children under 6 years old are overweight), which highlights a tension between in-kind transfers of nutrient- and calorie-rich foods that may be beneficial for some, yet may exacerbate health problems for others. These contextual factors also highlight the fact that the differential effects of cash and in-kind transfers are necessarily a function of both the contents of the in-kind transfers and the specific characteristics and preferences of the population at hand, an important consideration concerning the external validity of the findings of this study.

There have been two previous evaluations of the consumption effects of the PAL program. First, Skoufias, Unar, and Gonzalez-Cossio (2008) explored the effect of PAL transfers on household expenditure on consumption goods, and found that both in-kind and cash transfers lead to significant increases of similar magnitude in both food and total (food plus nonfood) consumption compared to the control. Second, Leroy et al. (2010) explored the program effects on household intake of energy and micronutrients, finding significant increases under both transfer types. My work confirms these findings and extends the analysis in several important ways.

First, I account for the fact that the in-kind transfer was in practice worth more than the cash transfer when valued at local prices, allowing for an accurate test of the prediction that infra-marginal in-kind transfers will have no differential effects compared to equal-valued cash transfers. Doing so, I find that the PAL in-kind transfer was infra-marginal for all households in terms of total food consumption and—consistent with theory—I cannot reject the hypothesis that the in-kind food transfer and an equal-valued cash transfer led households to the same increase in food consumption.

Second, I explore the extent to which the ten individual items in the in-kind basket distorted consumption. These items and transfer amounts were specifically chosen by the government in order to induce greater consumption of these goods, and information on the degree to which individual goods distort consumption (compared to cash) is necessary if we are to justify their use on paternalistic grounds. Indeed, I find a large variation in the extent to which food items are distorting. For example, beans are a commonly consumed food and in-kind bean transfers were small compared to consumption of beans under the cash transfer; thus, bean transfers were largely infra-marginal. In contrast, powdered milk was a sizable transfer relative to consumption under the cash transfer, and thus largely extra-marginal. Despite over-provision of certain goods, there is evidence that the extra-marginal transfers were not fully binding for some households, as suggested by reported consumption amounts under the in-kind transfer that were lower than the transfer amount.

Finally, paternalistic policymakers must primarily be interested in outcomes that result from the consumption of the in-kind good, rather than consumption of the in-kind good itself. For example, publicly provided labor market training programs are ultimately concerned with increasing productivity and employment, not classroom instruction time (the in-kind good) *per se*. Similarly, the paternalistic goal of in-kind food transfers is to change health outcomes, not necessarily to induce consumption of the particular foods that are transferred.

This is not a trivial distinction when transferred goods are substitutable with other nontransferred items, and those substitute goods affect the outcome of interest. That is, there is no reason to believe the specific transferred items (e.g., classroom instruction or powdered milk) are the only ones that can lead to the desired paternalistic outcomes

(e.g., increased productivity or better health). In fact, a simple theory of consumer demand with multiple goods shows that recipients will reduce the consumption of substitutes of binding, extra-marginal in-kind transfers (and increase the consumption of complements). These predictions were first formalized in the theory of rationing (Tobin and Houthakker 1950; Neary and Roberts 1980; Deaton 1981), and this paper provides the first empirical test of the theoretical predictions in the context of in-kind transfers.[1] For PAL food transfers, I find evidence that binding, extra-marginal transfers did induce households to substitute away from similar nontransferred foods.

Thus, the preferred measure of the paternalistic benefits of in-kind over cash transfers is their differential ability to improve outcomes of interest. For PAL, the main outcome of interest is health, in particular the health of children and women of childbearing age. After one year of receiving aid, I find minimal evidence of differential effects of in-kind and cash transfers in terms of sickness, height, and weight of both children and women, and no differential anemia prevalence amongst children. Nonetheless, using individual-level food recall data, there is evidence that in-kind transfers caused significantly more children and women to consume above the RDA of vitamin C, iron, and zinc than did cash. These increases are most likely due in part to greater consumption of the iron- and zinc-fortified powdered milk included in the in-kind basket.

Independent of the questions surrounding in-kind transfers, another key finding of this paper is that households spend very little of the cash transfer on vices, such as alcohol, tobacco, and junk food, as is often feared by paternalistic program administrators. Rather, the majority of the cash transfer is spent on nutritious food items, such as fruits and vegetables. These findings demonstrate that, in this context, poor households in rural areas use unrestricted cash transfers in ways that are (objectively) both individually and socially beneficial.

If there are paternalistic benefits to in-kind transfers, sound public policy must weigh them against their costs. One cost of distorting in-kind transfers is born directly by the recipient: equal-valued cash transfers are weakly preferred to transfers in kind, and thus extra-marginal and binding in-kind transfers offer lower utility than does cash. A second cost is incurred in distributing the transfers: it is likely that in-kind goods are more costly to distribute than cash. For the PAL transfers, the in-kind basket costs at least 18 percent more to administer than the cash transfer.

This paper offers important lessons for public policy. First, it adds to the literature estimating the distorting effects of in-kind food transfers. Most of the existing evidence comes from the United States Food Stamp Program, which demonstrates that these food vouchers are infra-marginal for most recipients and thus treated like cash (Moffitt 1989; Fraker, Martini, and Ohls 1995; Hoynes and Schanzenbach 2009; Whitmore 2002). For those recipients whose consumption is distorted, Whitmore (2002) shows that they have access to a well-developed resale market in food stamps, and that over-provided stamps that are not sold tend to induce consumption of some nonnutritious foods, such as soft drinks.

[1] Neary and Roberts (1980) and Deaton (1981) independently generalize the Tobin-Houthakker (1950) model of rationed consumer goods. These papers study constraints on consumption from above (rationing), while distorting in-kind transfers are one example of such a constraint from below. Furthermore, these papers consider only the consequences of rations or transfers that are fully binding, while the discussion in this paper is the first to generalize their framework to allow for nonbinding transfers or rations.

The developed country context, however, is very different from the one studied in this paper, and we know little about the distorting effects of in-kind food transfer programs in low-income settings. Some evidence can be gleaned from well-identified econometric evaluations of the consumption effects of cash transfer programs to the poor. Consistent with the findings of this paper, they largely demonstrate that cash is spent on nutritious foods (e.g., Hoddinott and Skoufias 2004 in Mexico; Attanasio and Mesnard 2006 in Colombia; Maluccio 2010 in Nicaragua). However, cash transfers are often conditional on school attendance and visits to health centers, or are coupled with in-kind nutritional supplements for young children (e.g., Attanasio et al. 2005; Behrman and Hoddinott 2005). As such, conditional transfer programs and hybrid in-kind/cash programs are less useful for fully separating out the effects of in-kind food versus cash transfers.

Finally, it is worth noting here that in-kind and cash transfers, injected into partially closed economies, may effect prices—cash transfers through an income effect, and in-kind transfers through both income and supply effects. In related work (Cunha, De Giorgi, and Jayachandran 2011), we show that the pecuniary effects for PAL transfers are small: prices did not increase under cash transfers, while in-kind transfers cause the prices of transferred goods to fall by 3 to 4 percent. Combining the effects on both PAL and non-PAL goods (which are potential substitutes of PAL goods), we find modest general equilibrium effects in both in-kind and cash villages of equal magnitude (equivalent to an additional 5 percent of the transfer value). As such, all estimates of program effects in this paper include both the direct effect of transfers and as well as these pecuniary effects.

This paper proceeds as follows. Section I outlines the theoretical framework and policy implications. Section II describes the PAL transfer program and field experiment. Section III discusses identification of the empirical results, which are presented in Section IV. Section V details the differential distribution costs of the PAL in-kind and cash transfers. Section VI concludes.

I. Cash versus Paternalistic In-Kind Transfers

A. *A Simple Demand Theory*

Consider the canonical Southworth (1945) model of consumer choice under cash and in-kind transfers depicted in Figure 1. Households have preferences over two goods, say, milk, q_M, and a composite good, q_F. A cash transfer shifts the original budget constraint $\overline{AB}$ up to $\overline{CE}$, while an equal-cost transfer of milk of quantity $\bar{q}_M$ leads to the kinked budget constraint $\overline{FDE}$ that depends on the resale price of milk.

Cash is weakly preferred to the transfer in-kind for any household. For example, household *I* is indifferent between transfer type, choosing I' under either transfer type. Household *II*, however, is weakly worse off under the in-kind transfer, choosing II' (the kink) if resale is unavailable and II'' if resale is costly, while it would have chosen II''' under the cash transfer.

The in-kind transfer of $\bar{q}_M$ is extra-marginal for household *II* when frictionless re-sale is unavailable, as it consumes more milk than it would have under the cash transfer. The in-kind transfer is infra-marginal for household *I* and is thus equivalent to

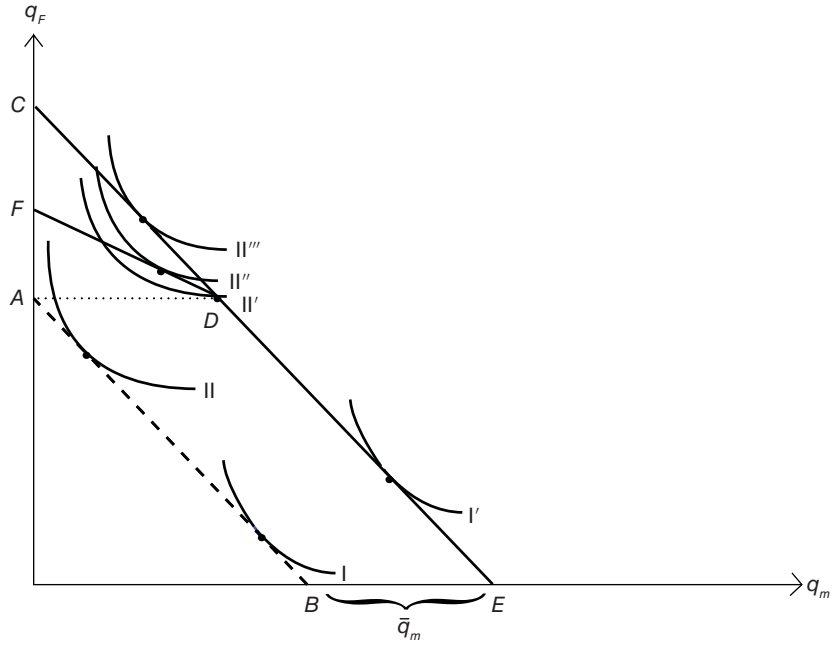

Figure 1. In-Kind Milk versus an Equal-Valued Cash Transfer

cash.[2] The in-kind transfer is nonbinding if the household consumes less of the good than it was provided, and binding otherwise. For example, the transfer is nonbinding for household *II* when it sells part of the transfer under a strictly positive resale price.

Thus, choices under the cash transfer compared to the quantity that would have been provided in-kind define the extra-marginality of the milk transfer, $EM_M(\bar{q}_M)$; choices under the in-kind transfer compared to what was provided in-kind define the amount of the transfer that was nonbinding, $NB_M(\bar{q}_M)$. Letting q_M^{Cash} and $q_M^{In\text{-}kind}$ represent demand for milk under cash transfer T and the in-kind transfer $\bar{q}_M$, respectively, we have:

$$(1) \qquad EM_M(\bar{q}_M) = \begin{cases} \bar{q}_M - q_M^{Cash} & if \quad q_M^{Cash} < \bar{q}_M \\ 0 & otherwise \end{cases} .$$

$$(2) \qquad NB_M(\bar{q}_M) = \begin{cases} \bar{q}_M - q_M^{In\text{-}kind} & if \quad q_M^{In\text{-}kind} < \bar{q}_M \\ 0 & otherwise \end{cases} .$$

[2] Note that extra-marginality is defined with respect to the post-cash transfer budget (rather than the pretransfer budget), as a cash transfer may change demand for the in-kind good. This distinction is important in practice when empirically measuring the extra-marginality of a transfer. For example, suppose the in-kind good is normal and a transfer of $\bar{q}_M$ is larger than pretransfer consumption. Compared to the pretransfer budget, $\bar{q}_M$ would be extra-marginal. However, it is possible that the income elasticity is large enough to induce a post-cash transfer consumption of milk greater than $\bar{q}_M$, in which case the in-kind transfer would be infra-marginal.

The *distortion effect* of the in-kind transfer, $D_M(\bar{q}_M)$, is defined as the quantity difference between the amount of the in-kind transfer that is consumed, over and above what would have been consumed under a cash transfer:

$$D_M(\bar{q}_M) = EM_M(\bar{q}_M) - NB_M(\bar{q}_M). \tag{3}$$

In general, it is difficult to empirically identify the distortion effect of an in-kind transfer as consumption choices are not simultaneously observable under both the in-kind and an equal-valued cash transfer.

Multiple Goods and Substitution.—This model is easily extended to cases when multiple goods are transferred in-kind and multiple nontransferred goods are available; such extensions are similar to Neary and Roberts' (1980) and Deaton's (1981) analysis of the rationing of consumer goods. With multiple in-kind goods, we must aggregate in order to compare the in-kind bundle as a whole to an equal-valued cash transfer. One meaningful aggregation uses market prices as a norm.[3] Let $(\bar{q}_n, p_n)$ represent transfer amounts and associated market prices for N in-kind goods, $n = \{1, \ldots, N\}$. With $EM_n(\bar{q}_n)$ and $NB_n(\bar{q}_n)$ defined as in (1) and (2), we have

$$EM_{Total}(\bar{q}_1, \ldots, \bar{q}_N) = \sum_{n=1}^{N} p_n EM_n(\bar{q}_n) \tag{4}$$

$$NB_{Total}(\bar{q}_1, \ldots, \bar{q}_N) = \sum_{n=1}^{N} p_n NB_n(\bar{q}_n). \tag{5}$$

The total distortion effect in monetary terms, with prices as a norm, is thus

$$D_{Total}(\bar{q}_1, \ldots, \bar{q}_N) = EM_{Total}(\bar{q}_1, \ldots, \bar{q}_N) - NB_{Total}(\bar{q}_1, \ldots, \bar{q}_N). \tag{6}$$

The presence of more than one nontransferred good, which are substitutes or complements with transferred goods, has important implications for the paternalistic benefits received from in-kind transfers. Specifically, households will substitute away from substitutes and toward complements of extra-marginal and binding in-kind transfers. For example, suppose that cheese and milk are substitutes, and a household receives an extra-marginal milk transfer that is binding; a simple demand model would predict that less cheese would be consumed than under an equal-valued cash transfer. If paternalistic benefits are derived from the total consumption of dairy products, not necessarily milk *per se*, transfers in-kind will become less attractive to the paternalistic donor in the presence of substitutes (and more attractive in the presence of complements).

[3] Other norms can be considered, such as a count of the number of goods that are extra-marginal or nonbinding for each household, or caloric content in the case of food.

Static versus Dynamic Consumption.—Note that this simple model is time-independent, leaving resale as the only explanation for observed nonbinding transfers. In practice, however, some in-kind items may be stored temporarily or otherwise consumed in a lumpy manner.[4] If consumption is indeed lumpy and is only observed at one point in time (as in the empirical example studied in this paper), empirical estimates of nonbinding transfers will only identify an upper bound on the extent of resale, and a lower bound on the quantity of the transfer that was not consumed.

B. *Social Welfare and Policy Objectives*

Clearly, the ability of in-kind transfers to distort consumption can be a strong motivator for a paternalistic government to impose their preferences on households when social and individual preferences do not coincide. These preferences may not coincide for many reasons. One important example is when in-kind transfers target individual family members, such as children or pregnant women, and cash transfers are given to a household head, who is often male. Another is if recipients have time-inconsistent preferences. In this case, in-kind transfers may be preferred by the household as a commitment mechanism if distorted present consumption leads to better long-run outcomes.

Regardless of the motivation, only extra-marginal and binding in-kind transfers can advance the paternalistic goals of changing consumption patterns differentially from an equal-valued cash transfer. Thus, a first stage of policy analysis should be to assess whether a given transfer will distort consumption.

However, distorted consumption in and of itself is not likely the end goal of public policy. Rather, it is more natural to believe that society is interested in changing outcomes that result from distorted consumption. With food transfers, we care about improvements in health rather than distorted food consumption; with public provision of education, we care about increased knowledge and productivity rather than increased instruction time or resource use. A second, and perhaps sufficient, stage of policy analysis is therefore to measure whether distorting in-kind transfers influence the outcomes of interest differentially from cash.

If no distortion in outcomes is found, it will be difficult to justify the additional costs associated with a transfer in-kind. If, however, an in-kind transfer is found to distort outcomes relative to cash, it becomes much harder to determine the optimal policy instrument, as we must know how much society is willing to pay for its paternalistic gains.

II. The Transfer Program, Experiment, and Data

A. *The Programa de Apoyo Alimentario*

PAL, which started in 2004 and is still active, operates in about 5,000 rural villages throughout Mexico. It is administered by the public/private company Diconsa, which

[4] In programs that are expected to continue indefinitely, however, a perpetually increasing quantity of stored goods seems unlikely.

maintains subsidized general stores in these areas. Monthly in-kind transfers contain seven basic items, enriched corn flour, rice, beans, dried pasta soup, biscuits, fortified milk powder, and vegetable oil; and two to four supplementary items, chosen from amongst canned sardines, canned tuna fish, dried lentils, chocolate, breakfast cereal, or corn starch. The contents were chosen by nutritionists to provide a balanced, nutritious diet of about 1,750 calories per day, per household (Campillo Garcia 1998). All of the items are common Mexican brands that are not produced locally, but by and large are available in local stores.[5] The transfer is not conditional on family size, is delivered bimonthly (two food boxes at a time), resale of in-kind food transfers is not prohibited, and the wholesale cost to the government per box is about 150 pesos (approximately $15 dollars). A woman (the household head or spouse of the head) is designated the beneficiary within the household, if possible.[6]

Transfers are intended to be conditional on attending monthly classes in health, nutrition, and hygiene, which were designed to promote healthy eating and food preparation practices. However, as I discuss below, during the time period this paper studies, the classes were attended by few transfer recipients and, importantly, administrators confirmed that the conditionality of transfers on class attendance was never enforced—that is, no household was denied transfers for not attending classes (González-Cossio et al. 2006). Furthermore, qualitative research finds that the classes were held infrequently, were generally of low quality, and were not taken seriously by participants, suggesting that classes did not likely impart new knowledge on program recipients that would impact their food consumption decisions (Rodríguez Herrero 2005).

Program eligibility is defined using census data and proceeds in two stages, where first poor, rural villages are deemed eligible and then poor households within eligible villages are offered the program. Villages are eligible to receive PAL if they have fewer than 2,500 inhabitants, are highly marginalized as classified by the Census Bureau, and do not currently receive aid from either *Liconsa*, a subsidized milk program, or *Oportunidades*, a conditional cash transfer program (formerly known as *Progresa*). As such, PAL villages are typically poorer and more rural than the widely studied *Progresa/Oportunidades* villages.[7] Household eligibility is determined through a means test, in which observable characteristics of permanent income are weighted to create a poverty index and households falling above a threshold are offered the program (Vázquez-Mota 2004).

Food aid boxes are assembled in several warehouses throughout the country and then delivered to a central location in each village. Program villages are required to elect a three-member Committee of Beneficiaries whose responsibilities include receiving the aid packages from program administrators, disbursing them to participants, and teaching the educational classes. Each household must collect its own aid

[5] I do not observe household food production. However, household survey data on consumption of own-produced foods shows that the only PAL good that is auto-consumed in any appreciable quantity is beans (10 percent of households consume own-produced beans at baseline).

[6] For example, in the working sample defined below, 74 percent of households in both in-kind and cash villages identify the recipient as female.

[7] PAL villages were typically not incorporated in *Progresa/Oportunidades* because they did not have health facilities and/or schools in close enough proximity, as needed to fulfill the conditionality of *Progressa/Oportunidades* transfers.

package from the committee and is required to present their PAL identification card in order to receive the package.

B. *The PAL Experiment*

Concurrent with the national roll-out of the program, 208 villages were randomly selected from the universe of PAL-eligible villages in eight southern states to be included in a Randomized Controlled Trial.[8] These villages were randomized into four groups using a simple randomization algorithm. Eligible households in experimental villages would receive either the in-kind transfer plus educational classes (the standard PAL treatment), an in-kind transfer without the education classes, a pure cash transfer of 150 pesos per month plus the education classes, or no transfer nor classes. All other aspects of the program (the role of the Committee of Beneficiaries, the timing and delivery of transfers, and eligibility requirements) were not manipulated by the experiment. Importantly, households had no reason to believe that the transfers would stop in the near future, nor did they have any reason to believe that the mode of transfer (cash versus in-kind) would change.

In practice, the randomization of the in-kind treatment into educational classes was confounded for several reasons. First, in some villages that were not selected to receive classes, the Committee of Beneficiaries independently set up sessions themselves upon learning about the education component of PAL (González-Cossio et al. 2006). While village-level data on the supply of classes is not available, survey evidence shows that 63 percent of self-reported transfer recipient households in the in-kind-without-education treatment arm in fact attended at least one educational class (compared to 75 percent of transfer recipient households in the in-kind-with-education arm).

Furthermore, very few classes were actually attended by any transfer recipients: both those recipients in in-kind and cash villages that were supposed to attend them, and those in in-kind villages that were randomized out of receiving the classes. For example, survey evidence shows that only about 4 educational classes were attended over approximately 12 months of treatment, while program rules stipulate 1 class per month should be attended. It is not clear why so few classes were attended, but the de facto unconditionality of the aid transfers must certainly play a role. (For further details on the education treatment and receipt of classes across experimental groups, see online Appendix A.)

For these reasons and to increase sample size, my analysis combines both in-kind treatment groups. Below, I demonstrate that results are robust to excluding the in-kind-without-education group.

C. *Data*

In each experimental village, a random sample of approximately 33 households (among both eligible and ineligible households) were selected for inclusion in

[8] The eight states are Campeche, Chiapas, Guerrero, Oaxaca, Quintana Roo, Tabasco, Veracruz, and Yucatán. Online Appendix Figure A.1 contains a map of experimental villages.

pre- and post-intervention surveys that were administered to the female head of the household, if possible. The surveys were administered by Mexico's National Institute of Public Health (*Instituto Nacional de Salud Publica* (INSP)), a different government agency than the one administering PAL. INSP was intentionally chosen to conduct the surveys so that respondents would not (mistakenly) think that their responses would affect the receipt of aid. The pre-intervention round was conducted between October 2003 and April 2004, before the means-test was applied in the cash and in-kind villages. The post-intervention round was conducted two years later in the final quarter of 2005. PAL began to phase-in aid delivery after the baseline surveys, completing coverage within a year. On average, households report receiving about 12 months of aid in between survey waves—an important factor in interpreting the cumulative effect of aid packages on health outcomes.

Household food consumption is defined as the sum of expenditures on individual foods eaten within the home plus expenditures on food eaten away from the home. A 7-day recall on 61 food items was used to capture consumption of food eaten in the home, and I construct village median unit-values as measures of prices in order to aggregate across goods. A single question captured consumption expenditure on foods eaten away from home. Household nonfood consumption was captured in 23 nonfood categories designed to cover the extent of nondurable, nonfood consumption. All household food and nonfood variables are converted to monthly levels for ease of comparison with PAL transfers.[9]

At the individual level, food consumption data was collected with a rolling 24-hour recall module for children aged one to four in the baseline and two to six in the follow-up, as well as for their mothers. Consumption quantities were converted by the INSP into caloric and micronutrient content using standard conversion factors. Unfortunately, I do not have data on the specific foods that were consumed. At times, I compare consumption to age-specific RDAs in order to assess the relative extent of undernourishment.

Individual health measures were collected for children and all women 12 through 54 years old in the baseline survey and 12 through 51 years old in the follow-up survey (i.e., those deemed to be of childbearing age). Height and weight were measured by the survey team for all women and children aged zero to four in the baseline and aged zero to six in the follow-up; the survey respondent self-reported the number of sick days in the last month for all women and children in both waves; and hemoglobin blood tests (to detect anemia) were administered for children aged two to six, though only in the post-treatment wave.[10]

Table 1 summarizes the seven basic and three supplementary items—lentils, canned fish, and breakfast cereal—that were included in the PAL food basket at the time of the follow-up survey in late 2005.[11] All of the items are nonperishable as

[9] Online Appendix B contains further details on the construction of unit-values and household consumption variables. Online Appendix Table A.2 lists all goods (PAL and non-PAL) used in the analysis.

[10] A child is classified as anemic if the altitude-adjusted concentration of hemoglobin in the blood is lower than 11 grams per deciliter (g/dL) for ages two to four, and 11.5 g/dL for ages five and six.

[11] It is unclear whether experimental households received canned tuna fish (weighing 0.35 kg) or canned sardines (weighing 0.8 kg). As the household food recall survey asks about these items jointly, I assume the mean weight and calories throughout.

Table 1—Summary of PAL In-Kind Food Box

Item	Type	Amount per box(kg)	Value per box (preprogram, in pesos)	Calories, as percent of total box
	(1)	(2)	(3)	(4)
Corn flour	Basic	3	15.5	20%
Rice	Basic	2	12.8	12%
Beans	Basic	2	20.8	13%
Fortified powdered milk	Basic	1.92	76.2	17%
Dried pasta soup	Basic	1.2	16.2	8%
Vegetable oil	Basic	1(lt)	10.5	16%
Biscuits	Basic	1	18.8	8%
Lentils	Supplementary	1	10.4	2%
Canned fish	Supplementary	0.6	14.7	2%
Cereal	Supplementary	0.2	9.3	1%
Total	—	—	205.1	100%

Notes: Value is calculated using the across village average of pretreatment village-level median unit values. Two hundred villages included. 10 pesos $\approx$ 1 USD. It is unclear whether a household received canned tuna fish (0.35kg) or canned sardines (0.8kg); the analysis assumes the mean weight and calories throughout.

delivered, and the distribution of caloric content suggests that the basket is the basis of a balanced diet, although notably absent are fruits and vegetables. At local preprogram prices, the PAL in-kind package is worth about 205 pesos. The powdered milk and corn flour are fortified with iron, zinc, and folic acid, three micronutrients known to be deficient in the Mexican diet (Barquera, Rivera-Dommarco, and Gasca-Garca 2001). The fortified items comprise about half the value of the box (92 pesos), a choice consistent with paternalistic preferences for greater micronutrient intake.

Note that the 150 peso cash transfer could only purchase about 73 percent of the in-kind basket. This discrepancy arose because the government set the cash transfer equal to their wholesale cost of purchasing the in-kind food basket, which was about 150 pesos per box. In order to make the policy-relevant comparison to equal-valued transfers, I extrapolate from observed program effects under cash transfers in the parametric analysis below (details to follow).

D. *Eligibility and Receipt of the Aid*

Receipt of PAL transfers was self-reported by households in the post-intervention survey, with approximately 88 percent of surveyed households in cash and in-kind villages reporting having received PAL transfers; one control household reported receiving aid. However, administrative data on eligibility and receipt of aid are not available during the experimental years, implying it is not possible to identify which households in control villages would have been eligible for the program, nor is it possible to confirm self-reports of treatment in cash and in-kind villages.

As such, I abstract from the self-reports of treatment, and compare all households in all villages in the empirical analysis. To the extent that ineligible households in treatment villages did in fact not receive transfers, comparing all households in all villages will include both the direct and the indirect effects of transfers that may arise through intra-household transfers (Angelucci and De Giorgi 2009).

E. *Sample and Baseline Balance*

Of the original 208 experimental villages, 2 could not be resurveyed due to concerns for enumerator safety and 6 more are excluded for various reasons: 2 were incorporated in PAL prior to the pretreatment survey; 2 villages were deemed ineligible for the experiment because they were receiving the conditional cash transfer program, *Oportunidades*, contrary to PAL rules; and 2 villages are geographically contiguous, potentially violating the Stable Unit Treatment Value Assumption (SUTVA).[12] Observable characteristics of excluded villages are balanced across treatment arms (results available upon request). Of the remaining 200 villages, 3 received the wrong treatment (one in-kind village did not receive the program, one cash village received both in-kind and cash transfers, and one control village received in-kind transfers). I include these villages and interpret results as intent-to-treat estimates.

Household attrition was low; however, it was significantly higher for the control group (17.4 percent) than for the in-kind and cash groups (11.6 and 12.0 percent, respectively). The difference in attrition rates between the in-kind and cash groups is strongly insignificant. I exclude a small number of households that were missing more than half of the consumption variables, were missing individual-level data, or reported preparing a special meal in the food recall window (together 0.3 percent of the sample). In the child-level analysis, I exclude several children who have inconsistent ages across waves or have extreme outliers in consumption (together 0.5 percent of the sample). Further details on the construction of this sample are available in online Appendix B.

Table 2 contains means, by treatment group, of household and village characteristics and suggests that the randomization was successful. Baseline characteristics are for the most part balanced across groups. Two variables do display significant differences across groups: the cash group has more households that raise animals or farm than does the control; and in-kind villages are more likely to have a Diconsa store than control villages. Note that for the primary comparison of interest—between cash and in-kind treatments—no variables are unbalanced at baseline with a significance level of less than 10 percent.

Table 2 also demonstrates the sample is poor. Monthly total consumption (food plus nonfood) per capita is about 480 pesos per month, or about $48 dollars. Furthermore, the budget share of food out of total consumption expenditure is large, at about 60 percent.

Tables 3 and 4 contain means, by treatment group, for child- and adult women-level demographics and outcomes, respectively. Again, baseline characteristics are for the most part balanced across groups. For children, one variable is slightly imbalanced across groups at the 10 percent level or below: more zinc is consumed by children in the in-kind than in the cash group. For adult women, one variable shows slight imbalance across groups: the cash group has a marginally higher percentage of women who were sick in the last week than does the in-kind group.

[12] The contiguous villages are named "Section 3 of Adalberto Tejada" and "Section 4 of Adalberto Tejada," so they appear to be part of the same administrative unit.

Table 2—Pretreatment Household Level Characteristics by Treatment Group

	Control	In-kind	Cash	Obs.	(1)=(2) *p*-value	(1)=(3) *p*-value	(2)=(3) *p*-value
	(1)	(2)	(3)		(4)	(5)	(6)
Household characteristics							
Number of household members	4.77	4.62	4.59	5,414	0.36	0.32	0.83
	(0.14)	(0.10)	(0.13)				
Years of education of household head	4.31	4.26	3.91	5,410	0.81	0.11	0.11
	(0.18)	(0.14)	(0.17)				
House has a dirt floor	0.32	0.30	0.32	5,414	0.70	0.93	0.60
	(0.04)	(0.03)	(0.03)				
Indigenous household	0.20	0.18	0.15	5,414	0.73	0.44	0.56
	(0.06)	(0.03)	(0.04)				
Household raises animals or farms	0.30	0.37	0.44	5,414	0.16	0.01**	0.14
	(0.04)	(0.03)	(0.04)				
Village characteristics							
Diconsa store in the village	0.30	0.45	0.38	5,414	0.08*	0.41	0.42
	(0.07)	(0.05)	(0.07)				
Local value of PAL in-kind basket	203.41	208.14	203.08	5,393	0.56	0.97	0.56
	(5.85)	(5.68)	(6.63)				
Household consumption (*monthly per capita*)							
In-home food consumption	308.47	293.80	288.39	5,414	0.39	0.26	0.71
	(13.94)	(9.53)	(11.09)				
Nonfood consumption	180.01	168.35	173.83	5,414	0.43	0.71	0.68
	(12.42)	(8.05)	(10.62)				
Out-of-home food consumption	15.36	12.49	11.11	5,414	0.21	0.10	0.52
	(1.93)	(1.25)	(1.75)				
Consumption of PAL in-kind foods	45.10	45.23	45.59	5,414	0.96	0.85	0.85
	(2.19)	(1.20)	(1.48)				

Notes: Includes all households in all villages. Standard errors in parentheses are clustered at the village level, *p*-values in columns 4–6 are from *F*-tests of the equality of means. A household is defined as indigenous if at least one member speaks an indigenous language. Household consumption variables and the value of the PAL in-kind basket are in pesos. Food consumption is defined as the aggregate value of consumption of 61 food items, valued using village median unit-values. Nonfood consumption is defined as the aggregate value of consumption of 23 nonfood, nondurable goods. PAL in-kind food items include: corn flour, rice, beans, pasta soup, powdered milk, vegetable oil, biscuits, lentils, canned fish, and breakfast cereal.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

It is difficult to make absolute statements about health from the consumption data, as the 24-hour food recall module could overstate or understate actual consumption. Nonetheless, comparing caloric and micronutrient intake for children in Table 3 to RDAs (not shown) suggests that most children consume too few calories and that for many, those calories do not contain enough essential micronutrients. Specifically, 89 percent of children consume fewer than the RDA of calories, and 32, 46, and 41 percent of children are not consuming the RDA of iron, vitamin C, and zinc, respectively. A similar comparison for the mothers of these children reveals that women are likewise undernourished, with 36, 70, and 61 percent of the sample not consuming the RDA of iron, vitamin C, and zinc, respectively.

In terms of measured health, about 36 percent of children and 23 percent of adult women were sick at least one day in the last month. Comparing weight

Table 3—Pretreatment Child Level Characteristics by Treatment Group

	Control	In-kind	Cash	Obs.	(1)=(2) *p*-value	(1)=(3) *p*-value	(2)=(3) *p*-value
	(1)	(2)	(3)		(4)	(5)	(6)
Child demographics							
Age	3.00	3.07	3.05	3,796	0.30	0.58	0.82
	(0.05)	(0.04)	(0.07)				
Male	0.52	0.52	0.49	3,795	0.93	0.23	0.15
	(0.02)	(0.01)	(0.02)				
Child consumption							
Caloric intake, daily	858.31	842.50	822.49	1,966	0.62	0.31	0.49
	(26.75)	(17.01)	(23.28)				
Vitamin C consumption, mg daily	32.30	31.06	37.20	1,966	0.72	0.30	0.13
	(3.00)	(1.68)	(3.69)				
Iron consumption, mg daily	5.21	5.16	5.07	1,966	0.84	0.59	0.67
	(0.21)	(0.15)	(0.17)				
Zinc consumption, mg daily	3.92	3.91	3.62	1,966	0.97	0.27	0.09*
	(0.23)	(0.11)	(0.13)				
Child health							
Weight (kg)	12.16	12.46	12.36	2,579	0.25	0.51	0.67
	(0.22)	(0.13)	(0.20)				
Height (cm)	84.97	85.79	85.30	2,516	0.36	0.75	0.58
	(0.75)	(0.48)	(0.73)				
Number of days sick in last month	2.34	2.48	2.27	3,757	0.65	0.82	0.44
	(0.25)	(0.19)	(0.20)				
Sick in last month	0.32	0.37	0.39	3,757	0.21	0.12	0.59
	(0.03)	(0.02)	(0.03)				
Hemoglobin level (g/dL)	12.18	—	—	590	—	—	—
	(0.10)						
Anemic	0.21	—	—	590	—	—	—
	(0.02)						

Notes: Includes children from all households in all villages. Standard errors in parentheses are clustered at the village level, *p*-values in columns 4–6 are from *F*-tests of the equality of means. Child demographics: Sample includes ages zero to six. Child consumption: Sample includes ages one to four. Calories and micronutrients are converted from food intake amounts collected in a 24-hour food recall, using a conversion table suggested by the Mexican government. Child weight and height: Sample includes ages zero to four. Child sickness: Sample includes ages zero to six. Sickness is self-reported by the survey respondent. Child hemoglobin level and anemia: Sample includes ages one to six in the post-treatment control group; data was not collected pretreatment. Hemoglobin levels were measured from blood samples; they are altitude adjusted. A child is defined as anemic if altitude-adjusted hemoglobin levels are less than 11g/dL for ages two to four, and less than 11.5g/dL for ages five to six.

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

and height of children with age-specific reference groups implies 9 percent are underweight, 21 percent overweight, and 18 percent are stunted (all defined as being two standard deviations away from the mean). Women, on the other hand, tend more toward obesity, with an average Body Mass Index (BMI) of about 26 (a BMI over 25 is considered overweight). Finally, anemia, predominately caused by iron deficiency, is highly prevalent (21 percent) among children in the control group post-treatment.

Table 4—Pretreatment Adult Women Level Characteristics by Treatment Group

	Control	In-kind	Cash	Obs.	(1)=(2) *p*-value	(1)=(3) *p*-value	(2)=(3) *p*-value
	(1)	(2)	(3)		(4)	(5)	(6)
Mother's consumption							
Caloric intake, daily	1,592.28	1,604.23	1,594.80	1,579	0.85	0.97	0.88
	(51.34)	(38.75)	(52.25)				
Vitamin C consumption, mg daily	59.62	53.16	63.08	1,579	0.30	0.67	0.13
	(5.49)	(2.92)	(5.90)				
Iron consumption, mg daily	10.71	10.65	10.49	1,579	0.93	0.75	0.74
	(0.56)	(0.28)	(0.40)				
Zinc consumption, mg daily	6.49	6.59	6.50	1,579	0.73	0.99	0.71
	(0.26)	(0.16)	(0.21)				
Adult women's health							
Weight (kg)	58.77	58.27	59.12	4,981	0.65	0.76	0.32
	(0.97)	(0.51)	(0.68)				
Height (cm)	150.46	150.71	151.24	4,959	0.67	0.19	0.25
	(0.49)	(0.32)	(0.33)				
Body Mass Index (BMI)	25.86	25.60	25.80	4,957	0.47	0.88	0.49
	(0.32)	(0.16)	(0.24)				
Number of days sick in last month	2.16	1.86	2.10	5,645	0.34	0.85	0.30
	(0.28)	(0.14)	(0.19)				
Sick in last month	0.24	0.22	0.26	5,645	0.46	0.39	0.06*
	(0.02)	(0.01)	(0.02)				

Notes: Includes individuals from all households in all villages. Standard errors in parentheses are clustered at the village level, *p*-values in columns 4–6 are from *F*-tests of the equality of means. Mother's consumption: Sample includes mothers of children aged one to four. Calories and micronutrients are converted from food intakes amounts collected in a 24-hour food recall, using a conversion table suggested by the Mexican government. Adult women's health: Sample includes women aged 12 to 54. Sickness is self-reported by the survey respondent.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

III. Identification and Empirical Strategy

Theory predicts that only extra-marginal and binding in-kind transfers will induce differential consumption compared to an equal-valued cash transfer, and it is precisely this distortion that is of interest to a paternalistic government. Therefore, I first estimate the distribution across households of the extra-marginality of the PAL in-kind transfers (EM_n and EM_{Total} in equations 1 and 4) by comparing consumption choices of in-kind foods under the cash transfer to what would have been provided in-kind. Then, I estimate the extent to which the PAL transfers were nonbinding (NB_n and NB_{Total} in equations (2) and (5)) by comparing the distribution of consumption choices under the in-kind transfer to amounts actually provided.

Subject to two caveats, randomization ensures that the difference in means between the distributions of extra-marginal and nonbinding transfers identifies the distortion effect of the in-kind transfers (EM_n and EM_{Total} in equations (3) and (6)). The first caveat is that while EM_n and EM_{Total} are correctly identified under an equal-valued cash transfer, in practice the cash transfer could only purchase about 73 percent of the in-kind basket. It is difficult to adjust for this unequal value of the

cash and in-kind transfers nonparametrically (a task more suited to a parametric analysis). However, if the in-kind foods are normal goods, the distribution of extra-marginal transfers provides an upper bound on the degree of extra-marginality of the PAL transfers.

The second caveat is that household consumption is only observed for a one-week period at some time between receipt of in-kind transfers. Therefore, it is difficult to separate between the resale of in-kind goods (which detracts from the paternalistic motive) and storage or otherwise lumpy consumption (which supports the paternalistic motive, in that the household will at some point consume the goods).[13,14]

Theory also predicts that households will substitute away from substitutes and toward complements of distorting in-kind transfers. Therefore, I next turn to a parametric analysis which allows for a more compact comparison of average treatment effects on consumption for various aggregations of PAL and non-PAL goods. This estimation framework also facilitates a straightforward comparison of equal-valued transfers, as described below. Finally, I use this parametric framework to look for differential effects of transfer type on the nutrition and health of women and children.

Estimation of Average Treatment Effects.—To improve efficiency, treatment effects are estimated using a difference-in-differences regression estimator, controlling for baseline covariates:

$$(7)\quad Y_{ijt} = \alpha + \gamma Post_t + \sum_{g=1}^{2} \delta_g Group_{gj} + \sum_{g=1}^{2} \beta_g (Group_{gj} \times Post_t) + \mathbf{X}_j \lambda + \varepsilon_{ijt}.$$

Y_{ijt} is the outcome for household or individual i in village j at time t, $Post_t$ is an indicator for the post-intervention survey, $Group_{gj}$, $g \in \{Cash, In\text{-}kind\}$, are cash and in-kind treatment group indicators, and $\mathbf{X}_j$ is a vector of pre-intervention village characteristics that show slight imbalance at baseline; indicators for the presence of a Diconsa store in the village and the month of the interview. The estimated parameters $\widehat{\beta_g}$ identify average treatment effects among households in cash and in-kind villages, while their difference identifies the differential effects of transfer types. Standard errors are clustered at the village level.

Equal-Valued Transfers.—The coefficients on the parameter $Cash \times Post$, $\widehat{\beta_{cash}}$, are identified through the exogenous income shock and are local estimates of the slopes of Engel curves. Therefore, a first-order approximation of the average treatment effects of equal-valued cash transfers are identified through $\widehat{\beta_{cash}} \times \frac{Mean\ Basket\ Value}{Cash\ Transfer\ Amount}$; for convenience, in the analysis that follows I refer to these extrapolated equal-valued estimates as $(Cash \times Post)^{EQ}$. Likewise, the differential effects of equal-valued in-kind over cash transfers are identified through $\widehat{\beta_{In\text{-}kind}} - \left(\widehat{\beta_{cash}} \times \frac{Mean\ Basket\ Value}{Cash\ Transfer\ Amount}\right)$.

[13] This caveat limits the extent to which this exercise measures the "stickiness" or "flypaper" effect of the transfers for the household as a whole (Jacoby 2002; Islam and Hoddinott 2009).

[14] Unfortunately, the survey does not identify the temporal difference between the survey date and the receipt of the PAL transfer with enough precision to permit exploration of heterogeneous treatment effects along this dimension.

Note that this linear extrapolation incorporates an assumption that goods are not local necessities or luxuries. While there is evidence in the literature supporting this assumption (e.g., Attanasio et al. 2009), it will be clear in the next section that the main conclusions about the differential consumption effects of cash versus PAL in-kind transfers hold even in the extreme (and unlikely) case that Engel curves are flat for income levels greater than the post-150 peso transfer level.[15] Furthermore, while the assumptions justifying linear Engel curves for consumption goods are relatively benign, it is perhaps less plausible to assume that Engel curves for health outcomes are linear; doing so would require additional assumptions about the shape of health production functions. As such, I do not extrapolate treatment effects for height, weight, sickness, and anemia prevalence. To the extent that health outcomes are increasing in income, pure treatment effects serve as upper bounds on the equal-valued in-kind over cash effects.

IV. Results

A. *Extra-Marginal and Nonbinding In-Kind Transfers*

Are PAL In-Kind Transfers Extra-Marginal?—It is important to first note that in terms of total food consumption, the in-kind transfer is infra-marginal for virtually all households. That is, under the 150 peso cash transfer only one household consumes fewer than 150 pesos of food per month (this is also the only household that consumes fewer than 205 pesos of food per month, the local value of the in-kind basket). However, there appears to be considerable over-provision for some individual PAL goods.

The solid curves in Figure 2 are empirical CDFs of monthly quantities consumed of each PAL item by post-transfer cash households (note the different scales on the horizontal axes); the samples are top coded at the ninety-fifth percentile for expositional convenience. I discuss the dashed curves below. The vertical lines delineate the PAL transfer quantities, $\bar{q}_n$. For households consuming less than $\bar{q}_n$, the distance to the vertical line is the extra-marginality of each item, $EM_n(\bar{q}_n)$. Evidently, many households do not consume the in-kind foods at all, even after receiving a sizable cash transfer. For example, powdered milk and canned fish are not consumed by about 82 percent and 76 percent of households receiving the cash transfer, respectively.

Integration of each CDF from zero to the vertical line would provide an estimate of the average quantity over-provided for the sample as a whole. The intersection of the CDF and the vertical line identifies the percentage of over-provided households, or the extensive margin of over-provision. Some items, such as beans and oil, are over-provided to only a few households (10 percent for each item) while others, such as milk powder and lentils, are over-provided to most households (90 percent and 91 percent, respectively).

The aggregate value of extra-marginal transfers for each household is obtained as in equation (4), using village-level prices. However, it will prove convenient to

[15] In ongoing work, I use the PAL experimental data to estimate flexible income elasticities in the framework of a formal demand system, and find that Engel curves for these consumption goods are by and large linear.

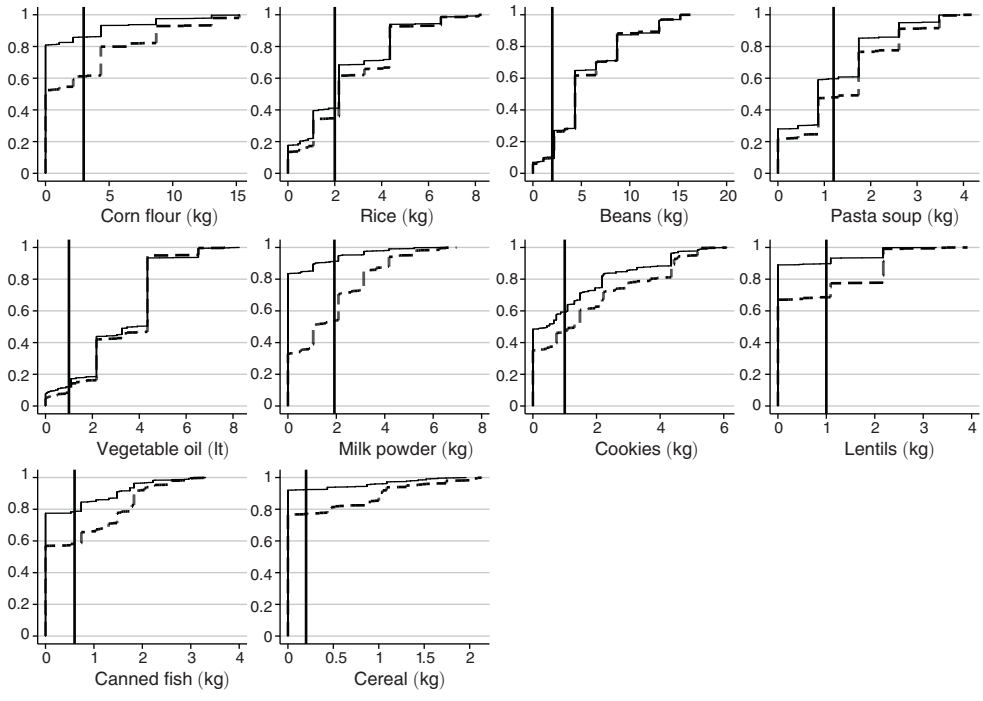

FIGURE 2. CDFS OF MONTHLY HOUSEHOLD CONSUMPTION QUANTITIES OF PAL IN-KIND FOODS

Notes: Vertical lines denote in-kind transfer quantities. Data is actual consumption from treated, post-transfer households. The distribution of each good is truncated at the ninety-fifth percentile. [Solid = Cash households, Dashed = In-kind households]

express $EM_{Total}(\bar{q}_1, \ldots, \bar{q}_{10})$ for each household as a percentage of the value of the in-kind basket—this distribution is plotted as the solid kernel density in Figure 3.[16] Over-provision is obviously not limited to a subset of households.[17] This density estimates the extent to which the PAL in-kind food basket would distort consumption, if it was perfectly binding (that is, the entire transfer was consumed). On average, 61.3 percent of the transfer was extra-marginal (the solid vertical line). However, note that the variance across households is large implying the burden of over-provision varies across the population.

Are PAL In-Kind Transfers Consumed?—The paternalistic benefits of in-kind transfers are lessened to the extent that households do not consume what was provided. Subject to the caveat concerning the lumpiness of consumption throughout the month, the dashed CDFs in Figure 2 estimate the extent to which in-kind transfers

[16] Algebraically, this kernel density estimates the distribution of $\frac{EM_{Total}(\bar{q}_1, \ldots, \bar{q}_{10})}{\sum_{n=1}^{10} p_{n,j} \bar{q}_n}$ evaluated at village prices $\{p_{n,j}\}$.

[17] Aggregating by the number of items that are extra-marginal leads to a similar conclusion. For example, 99.6 percent of households were over-provided with at least one good and 53.3 percent were over-provided with five or more goods.

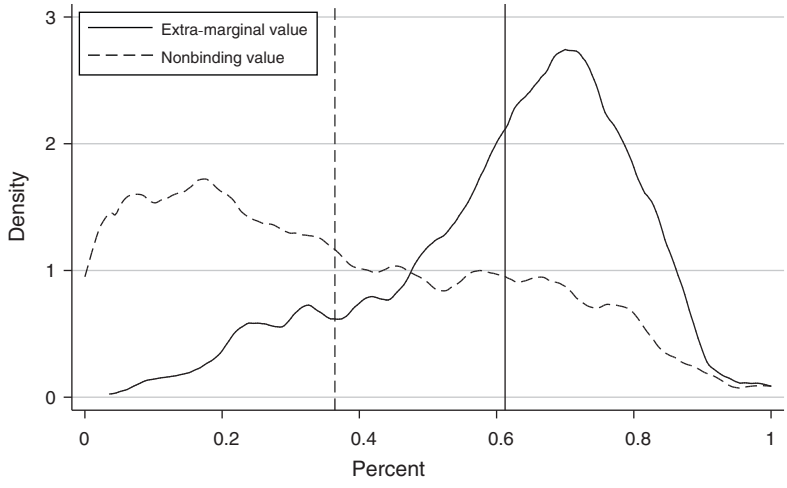

FIGURE 3. KERNEL DENSITIES OF MONTHLY HOUSEHOLD CONSUMPTION OF THE TEN PAL FOOD ITEMS AS A PERCENTAGE OF THE MONETARY VALUE OF THE BASKET

Notes: Vertical lines denote means. Data: Extra-marginal value uses treated cash households, nonbinding value uses treated in-kind households. [Solid = Cash households, Dashed = In-kind households]

were nonbinding, plotting monthly post-transfer household consumption of in-kind goods by households in the in-kind group. Transfers are nonbinding for households to the left of the vertical line, $\overline{q}_n$.

Infra-marginal transfers are by definition binding, so it is not surprising that the most infra-marginal items are those commonly consumed in large quantities, such as beans and oil. The three supplementary items—lentils, canned fish, and breakfast cereal—are nonbinding for most households (63 percent, 54 percent, and 72 percent, respectively). Transfers of these items were small in quantity, suggesting that this lack of observed consumption may be a result of lumpy consumption over time. However, there is no way to rule out that the lack of consumption is due to inter-household transfers.

Aggregating across goods, $NB_{Total}(\overline{q}_1, \ldots, \overline{q}_{10})$, valued using village prices, is divided by the total village price of the basket and plotted as the dashed kernel density in Figure 3. At the mean, 36.4 percent of the transfer is nonbinding. However, there is a large variance and the distribution is skewed left: 32.2 percent of the transfer is nonbinding for the median household.

The Distorting Effect of PAL In-Kind Transfers.— Aggregate distortion effects for individual food items are represented by the area between the solid and dashed CDFs in Figure 2. For example, the most distorting item is quite clearly milk powder, while the least distorting item is beans. Rice and oil appear to be rather nondistorting, while corn flour, cookies, canned fish, and lentils are somewhat more distorting.

The aggregate distortion effect of the in-kind basket is represented by the difference in means of the distributions in Figure 3. This difference is 24.9 percent of the value

Table 5—Effects of Cash and In-Kind Transfers on Aggregated Consumption

Outcome = Consumption per capita of	Food plus nonfood (1)	All food items (2)	PAL food items (3)	Non-PAL food items (4)	Nonfood items (5)
In-kind	−31.28	−18.21	−1.30	−16.91	−13.07
	(28.49)	(16.28)	(2.46)	(14.96)	(13.65)
Cash	−12.53	−15.70	−0.16	−15.54	3.17
	(30.60)	(17.33)	(2.78)	(15.74)	(15.35)
Post	196.05***	83.93***	7.35***	76.58***	112.12***
	(27.54)	(16.91)	(2.15)	(15.68)	(12.96)
In-kind × *Post*	50.69*	41.63**	44.05***	−2.43	9.06
	(28.44)	(17.62)	(4.07)	(15.79)	(13.64)
Cash × *Post*	36.09	24.35	5.98*	18.38	11.73
	(32.69)	(20.47)	(3.06)	(18.67)	(16.46)
Observations	10,985	10,985	10,985	10,985	10,985
Differential effect: *In-kind* × *Post* − *Cash* × *Post*	14.60	17.27	38.08***	−20.80	−2.67
H_0: *In-kind* × *Post* = *Cash* × *Post*, *p*-value	0.55	0.26	0.00	0.13	0.84
Equal valued transfer: $(Cash \times Post)^{EQ}$	48.86	32.97	8.09*	24.88	15.89
	(44.26)	(27.71)	(4.14)	(25.28)	(22.29)
Differential effect: *In-kind* × *Post* − $(Cash \times Post)^{EQ}$	1.83	8.65	35.96***	−27.31	−6.82
H_0: *In-kind* × *Post* = $(Cash \times Post)^{EQ}$, *p*-value	0.95	0.67	0.00	0.13	0.69

Notes: All dependent variables vary at the household level and are measured in pesos. Standard errors in parentheses are clustered at the village level. All regressions include as village level controls an indicator for the presence of a Diconsa store in the village pretreatment and indicators for interview month. $(Cash \times Post)^{EQ}$ is defined as $(Cash \times Post)$ multiplied by the ratio of the local value of the in-kind transfer to the cash transfer (see text). Food consumption is defined as in-home food consumption of 61 food items, valued using village median unit-values, plus out-of-home food consumption. PAL in-kind food items include: corn flour, rice, beans, pasta soup, vegetable oil, milk powder, biscuits, lentils, canned fish, and breakfast cereal. Nonfood consumption is defined as the value of aggregate consumption of 23 nonfood, nondurable goods.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

of the basket.[18] In level terms, in-kind PAL transfers forced households to consume, on average, 51.1 pesos (205.1×0.249), more of the 10 PAL food items than did the 150 peso cash transfer. This distortion is not trivial in magnitude, but neither is it as complete as perhaps would be ideal from the paternalistic donor's point of view.

B. *Treatment Effects on Consumption*

I now turn to examine how in-kind and cash transfers influenced household consumption of all goods, both PAL and non-PAL.

Aggregate Consumption.—Table 5 contains estimates from equation (7) for five household-level outcomes, measured per capita: total consumption (food plus nonfood), food consumption only, consumption of the ten PAL foods, consumption

[18] Note that randomization only identifies mean differences between the cash and in-kind groups. Without stronger assumptions, we cannot match the distributions to answer the question of what would be consumed under a cash transfer by those who were most distorted by the transfer in kind.

of the non-PAL foods, and nonfood consumption only. The bottom half of Table 5 contains several extra statistics: the differential effect of in-kind and cash transfers as implemented and p-values from tests of their significant difference; estimates of the predicted effects of a transfer of equal value to the in-kind basket—$(Cash \times Post)^{EQ}$—and their standard errors; and the differential effects of equal valued in-kind and cash transfers, along with p-values from tests of whether the difference is significant.

It is clear from column 1 that, as delivered, both cash and in-kind transfers increased total consumption relative to no transfer, and that effect sizes are indistinguishable from one another (p-value $= 0.55$). Moreover, the increases in consumption would remain statistically indistinguishable if the cash transfer had been of equal monetary value to the in-kind basket (p-value $= 0.95$): in-kind transfers increased total consumption by 50.69 pesos per capita, while an equal-valued cash transfer would have increased consumption by 48.86 pesos per capita.

Disaggregating, column 2 shows that we cannot reject the hypothesis that food consumption increased by the same amount under equal-valued transfer types: the difference between the in-kind effect and the equal-valued cash effect is a statistically insignificant 8.65 pesos. Importantly, however, households under both transfer types devoted the majority of their increased purchasing power toward food. Comparing across columns 1 and 2, food comprised 82 percent of the increase in total consumption for in-kind households and 67 percent of the increase for cash households.

Column 3 reiterates the results from the nonparametric analysis in the previous section. The increase in consumption of the ten PAL foods relative to the control was significantly higher under the in-kind transfer than under the cash transfer (both as implemented and if they had been of equal value). Specifically, in-kind transfers induced an extra 44.05 pesos of consumption of in-kind foods per capita, while the cash transfer only induced an 5.98 peso per capita increase. The ratio of estimates in columns 2 and 3 is the percentage of the increase in food consumption that were on PAL foods: 87 percent of food increases for in-kind households were on in-kind goods, compared to about one-fifth of that percentage (17 percent) under equal-valued cash transfers. For completeness, column 4 contains estimates on consumption of the 51 non-PAL food items. Not surprisingly, in-kind transfers induced virtually no increase in the consumption of non-PAL food items (-2.43 pesos per capita), while the majority of food consumption increases under the cash transfer were on non-PAL items.

Column 5 shows that neither in-kind nor equal-valued cash transfers induced significant increases in nonfood consumption compared to the control, although the point estimate under the cash transfer is economically large. Comparing across treatments, the point estimates are not significantly different from one another (p-value $= 0.63$).

It is worth noting that treatment effects are approximately the same size as the value of the transfer, suggesting that transfers were not saved. Scaling per capita treatment effects in column 1 of Table 5 up to the household level implies multiplier effects for total consumption of 1.07 for the in-kind transfer and 1.04 for the cash transfer; neither of these point estimates are significantly different from unity.

TABLE 6—EFFECTS OF CASH AND IN-KIND TRANSFERS, ROBUSTNESS TO THE EXCLUSION OF THE IN-KIND VILLAGES THAT WERE RANDOMIZED OUT OF EDUCATION CLASSES

Outcome = Consumption per capita of	Sample: Excludes in-kind households in villages randomized out of receiving education classes.				
	Food plus nonfood (1)	Food (2)	PAL food items (3)	Non-PAL food items (4)	Nonfood (5)
In-kind	−23.16	−11.35	−1.57	−9.78	−11.81
	(31.18)	(18.79)	(2.76)	(17.37)	(14.38)
Cash	−12.17	−15.18	−0.26	−14.92	3.00
	(30.27)	(17.14)	(2.76)	(15.54)	(15.20)
Post	205.58***	90.23***	7.52***	82.71***	115.35***
	(29.37)	(17.85)	(2.24)	(16.60)	(13.96)
In-kind × *Post*	57.31*	39.80*	42.01***	−2.20	17.51
	(34.42)	(21.51)	(5.66)	(18.77)	(16.55)
Cash × *Post*	38.34	24.25	6.04**	18.20	14.10
	(34.36)	(21.23)	(3.04)	(19.50)	(17.34)
Observations	8,206	8,206	8,206	8,206	8,206
Differential effect: *In-kind* × *Post* − *Cash* × *Post*	18.97	15.56	35.96***	−20.40	3.41
H_0: *In-kind* × *Post* = *Cash* × *Post*, *p*-value	0.53	0.42	0.00	0.22	0.83
Equal valued transfer: $(Cash \times Post)^{EQ}$	51.91	32.83	8.18**	24.64	19.09
	(46.52)	(28.74)	(4.11)	(26.41)	(23.48)
Differential effect: *In-kind* × *Post* − $(Cash \times Post)^{EQ}$	5.40	6.98	33.82***	−26.85	−1.58
H_0: *In-kind* × *Post* = $(Cash \times Post)^{EQ}$, *p*-value	0.89	0.77	0.00	0.20	0.94

Notes: All dependent variables vary at the household level and are measured in pesos. Standard errors in parentheses are clustered at the village level. All regressions include as village level controls an indicator for the presence of a Diconsa store in the village pretreatment and indicators for interview month. $(Cash \times Post)^{EQ}$ is defined as $(Cash \times Post)$ multiplied by the ratio of the local value of the in-kind transfer to the cash transfer (see text).

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Robustness of Results.—These results suggest that in-kind and cash transfers both led to large increases in aggregate consumption of similar magnitude relative to the control. The majority of transfers were spent on food under both transfer types and, importantly, in-kind transfers did not induce significantly more food consumption than did an equal-valued cash transfer. I check the robustness of these results in several ways.

First, one concern is that the educational classes had an effect on household behavior. To address this concern, I check the robustness of the results on household-level consumption when excluding households in the in-kind group that was randomized out of receiving educational classes (yet self-reported receiving the same number of classes as the group that was randomized into receiving classes). Table 6 contains these results, and all point estimates change very little compared to Table 5.

Second, as mentioned above, attrition was significantly higher for the control group, at 17.4 percent, than for the in-kind and cash groups, at 11.6 and 12.0 percent,

respectively. To explore the extent of possible bias due to differential attrition across treatment and control villages, I estimate Lee bounds (Lee 2009) for these main aggregated consumption outcomes, which are displayed in online Appendix Table A.3. Not surprisingly (given the small differential rates of attrition), the main comparison of interest between in-kind and cash treatments is unaffected by even these most extreme assumptions on differential attrition. Lee bounds on absolute treatment effects, however, are wider for some outcomes. For example, the lower bounds on the absolute effects on total consumption and on food consumption under both in-kind and cash transfers are not distinguishable from zero. The lower bound on the absolute treatment effect of consumption of PAL food items, however, is still significantly greater than zero under the in-kind transfer and indistinguishable from zero under the cash transfer. Regardless, the size of these bounds suggest that they should be taken into consideration when interpreting the absolute effects of in-kind and cash PAL transfers.

Finally, all results are robust to the exclusion of baseline covariates which include indicators for the presence of a Diconsa store in the village and the month of the interview (results available upon request).

B.2 Disaggregate Consumption.—Disaggregating further to individual food items allows me to explore whether the increase in consumption under cash transfers were spent in a manner consistent with the social preferences that motivated the PAL food transfers, and to what extent the PAL in-kind transfers induced substitution amongst similar nontransferred goods. Table 7 presents estimates of the effects of equal-valued cash transfers and in-kind transfers, estimated by equation (7) along with *p*-values from tests of their equality for six main consumption categories and several subcategories of interest.

Fruits, Vegetables.—Fruits and vegetables increased markedly under both transfer types, at 9 pesos per capita under the in-kind transfer and 15.4 pesos per capita under the equal-valued cash transfer (these increases are indistinguishable from each other at the 19 percent level). In fact, fruits and vegetables comprised a significant portion of the increase in food: about 22 and 64 percent under the in-kind and cash transfers, respectively. To the extent that fruits and vegetables improve health, this is certainly evidence against the paternalistic justification for in-kind transfers.

Grains, Pulses.—Five of the ten PAL goods are grain based (corn flour, rice, pasta, biscuits, and cereal) and Table 7 shows that consumption of each was significantly higher under the in-kind transfer compared to an equal-valued cash transfer. However, increases in overall grain consumption under both transfer types are more similar in magnitude (p-value $= 0.12$), at 16.28 and 8.26 pesos per capita under the in-kind and equal-valued cash transfer, respectively. This is evidence that the in-kind transfers induced households to substitute away from other types of grains (such as wheat based products) toward PAL in-kind grains, leading to only a slight distorting effect of the in-kind transfers for grains overall.

Two PAL goods are pulses: beans and lentils (the only pulses included in the food recall survey). Lentil consumption increased significantly under the in-kind transfer

Table 7—Effects of Cash and In-Kind Transfers on Disaggregated Consumption Categories

Consumption per capita	*In-kind* × *Post* (1)	(s.e.) (2)	$(Cash \times Post)^{EQ}$ (3)	(s.e.) (4)	(1)=(3) *p*-value (5)
Fruits and vegetables	9.00**	(3.80)	15.40**	(6.34)	0.19
All grains and pulses	16.28***	(3.69)	8.26	(5.83)	0.12
Corn flour †	2.30***	(0.66)	−0.20	(0.91)	0.00***
Corn kernels and tortillas	−0.22	(2.01)	3.94	(3.70)	0.21
Rice †	0.49	(0.33)	−0.69	(0.49)	0.00***
Pasta †	1.55***	(0.32)	−0.26	(0.46)	0.00***
Biscuits †	6.36***	(0.90)	3.72***	(1.12)	0.01**
Cereal †	3.96***	(0.80)	0.26	(0.77)	0.00***
Beans †	−0.11	(0.72)	−0.01	(1.00)	0.89
Lentils †	1.88***	(0.21)	0.07	(0.22)	0.00***
All dairy and animal products	13.70*	(7.85)	7.93	(12.16)	0.52
Milk powder †	23.37***	(2.32)	4.59***	(1.38)	0.00***
Liquid milk	−12.57***	(2.62)	−2.29	(4.04)	0.00***
Cheese and yogurt	0.19	(1.41)	0.84	(2.25)	0.69
Chicken	−1.54	(2.01)	−0.74	(3.15)	0.77
Beef and pork	2.04	(1.57)	2.27	(2.44)	0.90
Seafood	−0.09	(1.82)	3.71	(3.46)	0.20
Canned fish†	4.29***	(0.63)	1.32	(0.81)	0.00***
All fats	0.28	(0.73)	0.20	(1.17)	0.92
Vegetable oil †	0.61	(0.56)	−0.59	(0.80)	0.03**
Lard and mayonnaise	−0.30	(0.36)	0.79	(0.63)	0.04**
Vices					
Junk food and sweet drinks	1.90	(3.09)	1.87	(4.66)	0.99
Alcohol	0.11	(1.46)	0.83	(2.12)	0.66
Tobacco	−0.43	(0.50)	−1.55*	(0.78)	0.05*
Nonfood					
Education related expenses	2.66	(3.53)	6.07	(5.75)	0.45
Medicine and hygiene products	4.59	(5.01)	8.67	(9.48)	0.61
Transportation	1.45	(4.97)	2.07	(7.90)	0.91
Clothing	−1.45	(1.89)	−1.09	(2.87)	0.87
Household items	1.76	(4.66)	1.52	(7.25)	0.96

Notes: In-kind × *Post* are from estimation of equation (7); $(Cash \times Post)^{EQ}$ are from a linear extrapolation of the coefficient *Cash* × *Post* (see text). Dependent variables are household expenditure per capita in the given category, measured in pesos. All regressions include baseline village level controls (the presense of a Diconsa store and month of interview indicators). Standard errors in parentheses are clustered at the village level. Sample sizes range from 10,758 to 10,985.

† Indicates in-kind item.
*** Significant at the 1 percent level.
** Significant at the 5 percent level.
* Significant at the 10 percent level.

and not at all under the cash transfer. The small and insignificant increase in bean consumption reflects the earlier finding that bean transfers were largely infra-marginal.

Dairy, *Animal*, *Fats*.—In-kind transfers of milk powder led to over 5 times greater consumption of milk powder than what would have been consumed under an equal-valued cash transfer: 23.37 pesos versus 4.59 pesos per capita. At the same time, milk powder transfers induced households to substitute away from liquid milk, as evidenced by the significant 12.57 peso per capita decrease in liquid milk consumption (compared to no significant change in liquid milk consumption under

the cash transfer). Overall, dairy consumption was about four times higher under the in-kind transfer compared to cash (not shown). If we believe dairy is an important determinant of child health, this evidence again suggests that we must examine program effects on health in order to justify transfers in kind rather than in cash.

There is more evidence of substitution induced by the in-kind transfers among animal-derived foods and fats. In-kind canned fish transfers significantly increased canned fish consumption by 4.29 pesos per capita relative to cash, but these households would have consumed more of other types of seafood under a cash transfer ($(Cash \times Post)^{EQ}$ for seafood is 3.71 pesos, although not statistically significant). Fats are disaggregated to the PAL in-kind good vegetable oil and the common oil substitutes, mayonnaise and lard. While the effects are small in economic magnitude, it appears that in-kind households substituted away from consumption of mayonnaise and lard towards the vegetable oil they received in-kind.

Vices.—Paternalistic food transfers are often motivated by the fear that unconstrained cash transfers will be spent on vices, such as unhealthy foods and drinks, alcohol, and tobacco. The evidence in Table 7 suggests this fear is unfounded for the PAL cash transfers. The "junk food and sweet drinks" category contains candy (dulces), chocolate, fried corn or potato chips (frituras), snack cakes (pastelillos), soda, and sweet fruit drinks. There were small and insignificant increases in consumption of these goods under both in-kind and equal-valued cash transferees of about 2 pesos per capita.

Neither transfer type induced significant increases in alcohol consumption. However, it is important to note that only 5 percent of households report consuming any alcohol at all. Reported consumption is likely an underestimate of true alcohol consumption as the food recall survey was usually answered by the female head of the household who might not be aware of all alcohol purchases by other family members. Importantly, the size of any unmeasured program effects on alcohol consumption is limited by the fact that the entire value of the transfer is already accounted for in other purchases. Surprisingly, the evidence suggests a negative income elasticity for tobacco, with a marginally significant negative effect of an equal-valued cash transfer of 1.55 pesos.

Nonfood Goods.—The large (although statistically insignificant) increase in nonfood consumption under the cash treatment, compared to the in-kind treatment, is concentrated in purchases of education related expenses and medicine and hygiene products. For example, increases in spending in the cash group on medicine and hygiene products, which includes medicine, medical fees, and personal hygiene products, are of about the same magnitude as their increased consumption of fruits and vegetables. There do not appear to be any differential effects of transfer type on clothing, transportation or household items.

C. *Treatment Effects on Nutrition and Health*

The final empirical analysis explores whether the small observed differences in consumption across transfer type led to meaningful changes in the health and

nutrition of women and children (the only individuals for whom this data was collected). For each outcome other than anemia prevalence, I estimate equation (7). For anemia prevalence, I use a single-differenced version of equation (7) as data is only available post-treatment. All individual-level models include age fixed effects, and child-level models include a control for gender.

Nutrition.—Tables 8 and 9 contain program effects on nutritional intake for children and their mothers, respectively. In each table, columns 1–4 present in-kind and equal-valued cash transfer treatment effects, and p-values from tests of their equality for the levels of calories and micro-nutrients. In order to assess the economic meaningfulness of these effects, columns 5–8 of each table present program effects on indicators of whether the individual consumed above the RDA. As discussed above, the equal-valued extrapolation is not well-defined for the distribution of treatment effects, so I report only the observed treatment effects under the cash transfer for the above-RDA-indicators, which can be considered a lower bound on the effects of equal-valued transfers.

First looking at children, point estimates in column 1 of Table 8 show that both in-kind and cash transfers increased caloric intake over the control, but that the increase is only significant under the in-kind transfer (p-value < 0.01), the effects of in-kind and cash transfers are indistinguishable from one another (p-value $= 0.21$). Column 5 shows that these absolute increases in energy intake are meaningful. The in-kind transfer induced 6 percentage points more children to consume over the RDA of calories (p-value < 0.05) while the cash transfer induced an insignificant 4 percentage points more children to consume above the RDA; again, these effects are indistinguishable from one another (p-value $= 0.35$).

Despite modest increases in caloric intake, it appears both transfer types increased the intake of important nutrients amongst young children, with similar magnitudes (columns 2, 3, and 4). The in-kind transfer significantly increased iron, vitamin C, and zinc consumption compared to the control; equal-valued cash transfers induced similar increases, although point estimates are less precisely estimated. Comparing across transfer types, there are no significant differences in treatment effects for consumption of these micro-nutrients.

Importantly, it appears that the increases in micronutrient consumption under the in-kind transfer were more meaningful than those under the cash transfer. Columns 6, 7, and 8 of Table 8 show that the in-kind transfer increased the percentage of children consuming greater than the RDA of vitamin C, iron, and zinc by 21, 11, and 11 percentage points, respectively, compared to 9, 0, and 3 percentage point increases under the cash transfer. While all of these differences are significant, it is important to keep in mind that these above-RDA-effects are comparing transfers of unequal value, and are likely a lower bound on the effect of equal-valued transfers. Regardless, this evidence suggests that the paternalistic goal of in-kind transfers was fulfilled, at least in part; in-kind milk powder and corn flour were fortified with vitamin C, iron, and zinc, and children consumed more of these nutrients (although we do not know whether the nutrients came from the specific foods that were transferred in-kind).

Moving to mothers in Table 9, we see a similar set of results as for their children. First, there does not appear to be any significant change in caloric intake amongst

Table 8—Effects of Cash and In-Kind Transfers on Children's Caloric and Nutritional Intake

	Calories	Vitamin C (mg)	Iron (mg)	Zinc (mg)	Calories > RDA	Vitamin C > RDA	Iron > RDA	Zinc > RDA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
In-kind × *Post*	89.92**	22.81***	1.28***	1.18***	0.06**	0.21***	0.11***	0.11**
	(39.98)	(5.08)	(0.43)	(0.32)	(0.03)	(0.04)	(0.04)	(0.05)
$(Cash \times Post)^{EQ}$	21.85	23.77**	0.64	0.84*				
	(67.68)	(10.20)	(0.68)	(0.46)				
Cash × *Post*					0.04	0.09	0.00	0.03
					(0.03)	(0.05)	(0.04)	(0.06)
Observations	4,031	4,031	4,031	4,031	4,031	4,031	4,031	4,031
H_0: *In-kind* × *Post* $= (Cash \times Post)^{EQ}$, *p*-value	0.21	0.92	0.26	0.35				
H_0: *In-kind* × *Post* = *Cash* × *Post*, *p*-value					0.35	0.02**	0.00***	0.08*

Notes: Sample includes children aged one to four in the baseline, and two to six in the follow-up. Data is from the 24-hour food recall module. *In-kind* × *Post* and *Cash* × *Post* are from OLS estimation of equation (7); $(Cash \times Post)^{EQ}$ is defined as (*Cash* × *Post*) multiplied by the ratio of the local value of the in-kind transfer to the cash transfer (see text). All regressions include baseline village level controls (the presence of a Diconsa store and month of interview indicators), age fixed effects, and an indicator for gender. Standard errors in parentheses are clustered at the village level.

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

Table 9—Effects of Cash and In-Kind Transfers on Mother's Caloric and Nutritional Intake

	Calories	Vitamin C (mg)	Iron (mg)	Zinc (mg)	Calories > RDA	Vitamin C > RDA	Iron > RDA	Zinc > RDA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
In-kind × *Post*	−21.44	24.91***	0.31	0.43	−0.04	0.17***	0.10**	0.08
	(75.61)	(7.71)	(0.80)	(0.43)	(0.04)	(0.04)	(0.05)	(0.05)
$(Cash \times Post)^{EQ}$	−102.89	25.06	0.08	0.21				
	(124.68)	(15.13)	(1.32)	(0.72)				
Cash × *Post*					−0.01	0.09*	0.01	0.00
					(0.05)	(0.05)	(0.06)	(0.06)
Observations	3,076	3,076	3,076	3,076	3,076	3,076	3,076	3,076
H_0: *In-kind* × *Post* $= (Cash \times Post)^{EQ}$, *p*-value	0.41	0.99	0.80	0.68				
H_0: *In-kind* × *Post* = *Cash* × *Post*, *p*-value					0.48	0.03**	0.06*	0.13

Notes: Sample includes the mothers of children who are aged one to four in the baseline, and two to six in the follow-up. Data is from the 24-hour food recall module. *In-kind* × *Post* and *Cash* × *Post* are from OLS estimation of equation (7); $(Cash \times Post)^{EQ}$ is defined as (*Cash* × *Post*) multiplied by the ratio of the local value of the in-kind transfer to the cash transfer (see text). All regressions include baseline village level controls (the presence of a Diconsa store and month of interview indicators) and age fixed effects. Standard errors in parentheses are clustered at the village level.

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

mothers due to either transfers type (column 1), nor an effect on consuming more than the RDA of calories (column 5). Given the propensity for this population to be overweight, the negative point estimates are a reassuring result that transfers are not exacerbating overeating.

TABLE 10—EFFECTS OF CASH AND IN-KIND TRANSFERS ON CHILDREN'S HEALTH

	Weight (kg)		Height (cm)		BMI *z*-score	Sick in last month		Anemic
Sample	Ages 0 to 6	Ages 0 and 1	Ages 0 to 6	Ages 0 and 1	Ages 2 to 6	Ages 0 to 6	Ages 0 and 1	Ages 1 to 6
= Ages at follow-up	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
In-kind × *Post*	0.09	0.11	0.42	0.56	−0.03	−0.07*	−0.03	−0.01
	(0.15)	(0.19)	(0.34)	(0.79)	(0.05)	(0.04)	(0.05)	(0.03)
Cash × *Post*	−0.13	0.08	−0.25	0.58	−0.08	−0.10**	−0.08	−0.02
	(0.16)	(0.21)	(0.41)	(0.88)	(0.07)	(0.05)	(0.07)	(0.03)
Observations	6,070	1,853	5,964	1,810	1,962	7,450	1,962	2,449
H_0: *In-kind* × *Post* = *Cash* × *Post*, *p*-value	0.10	0.86	0.05*	0.98	0.41	0.48	0.41	0.69

Notes: Weight and height: The 0 to 6 age group sample includes children between 0 and 4 in the baseline and 0 to 6 in the follow-up, the only data collected in the survey. The 0 to 1 age group sample includes children of these ages in both survey waves. The BMI *z*-score sample includes children aged 2 to 4 in the baseline and 2 to 6 in the follow-up; *z*-scores are calculated relative to the 2000 US CDC growth reference population. Sick in last month: Sample includes all children aged 0 to 6 in both survey waves. Anemic: Sample includes only post-treatment data for children aged 1 to 6. *In-kind* × *Post* and *Cash* × *Post* are from OLS estimation of equation (7) (see text). Standard errors in parentheses are clustered at the village level. All regressions include baseline village level controls (the presence of a Diconsa store and month of interview indicators), age fixed effects, and an indicator for gender.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

In terms of micro-nutrients, mothers consume more vitamin C under both in-kind and equal-valued cash transfers (significantly so for in-kind transfers), although not more iron or zinc; none of these effects are statistically distinguishable between transfer type. However, as with children, columns 6, 7, and 8 of Table 9 show that in-kind transfers are more likely than cash to induce mothers to consume above the RDA of micro-nutrients; 17, 10, and 8 percentage points more mothers consumed above the RDA of vitamin C, iron, and zinc, respectively, due to in-kind transfers compared to 9, 1, and 0 percentage point increases under (nonequal-valued) cash transfers. Keeping in mind the caveat that the above-RDA-effects are not comparing equal-valued transfers, these results again suggest that the paternalistic goals of increased nutritional intake under in-kind transfers was in part fulfilled for mothers.

Health.—Public policy should ultimately be concerned with changing the welfare of program recipients, not simply changing their consumption as an intermediate step. In the case of the PAL food transfers, the main welfare measures of interest concern health. Tables 10 and 11 contain program effects for children and adult women, respectively. Similar to the above-RDA consumption indicators, I do not extrapolate cash treatment effects for these outcomes: if health is increasing in income, the estimated cash treatment effect is likely a lower bound, and any positive effect of in-kind over cash is likely an upper bound. Furthermore, in order to explore the distribution of treatment effects, Figures 4 and 5 contains kernel densities of several key outcomes from the post-treatment survey for children and adult women, plotted by treatment group.

Table 11—Effects of Cash and In-Kind Transfers on Adult Women's Health

	Weight (kg)	Height (cm)	BMI	Sick in last month
	(1)	(2)	(3)	(4)
In-kind × *Post*	0.21	−0.19	0.18	0.00
	(0.48)	(0.29)	(0.17)	(0.03)
Cash × *Post*	−0.01	−0.37	0.15	0.02
	(0.55)	(0.33)	(0.19)	(0.03)
Observations	9,219	9,185	9,346	11,376
H_0: *In-kind* × *Post* = *Cash* × *Post*, *p*-value	0.62	0.48	0.79	0.60

Notes: Sample includes women aged 12 to 54 in the baseline survey and 12 to 51 in the follow-up survey. *In-kind* × *Post* and *Cash* × *Post* are from OLS estimation of equation (7) (see text). Standard errors in parentheses are clustered at the village level. All regressions include baseline village level controls (the presense of a Diconsa store and month of interview indicators) and age fixed effects.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

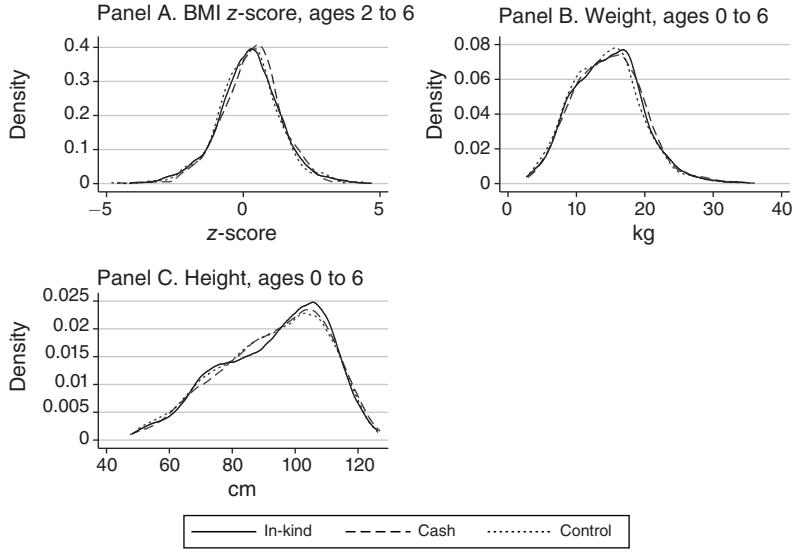

Figure 4. Kernel Densities of Selected Health Outcomes for Children Posttreatment, by Treatment Group

First looking at children, it does not appear that either the in-kind or cash transfer affected the weight of children. Relative to the control, point estimates in column 1 of Table 10 show that induced changes in weight for children aged zero to six are small and insignificant, both statistically and economically. For example, the positive point estimate of 0.09 kg under the in-kind transfer represents an increase of less than 1 percent over baseline weight. The difference between transfer types is marginally significant at the 10 percent level, but again the magnitude of this effect is small. As we may expect the health effects to be the greatest for the youngest

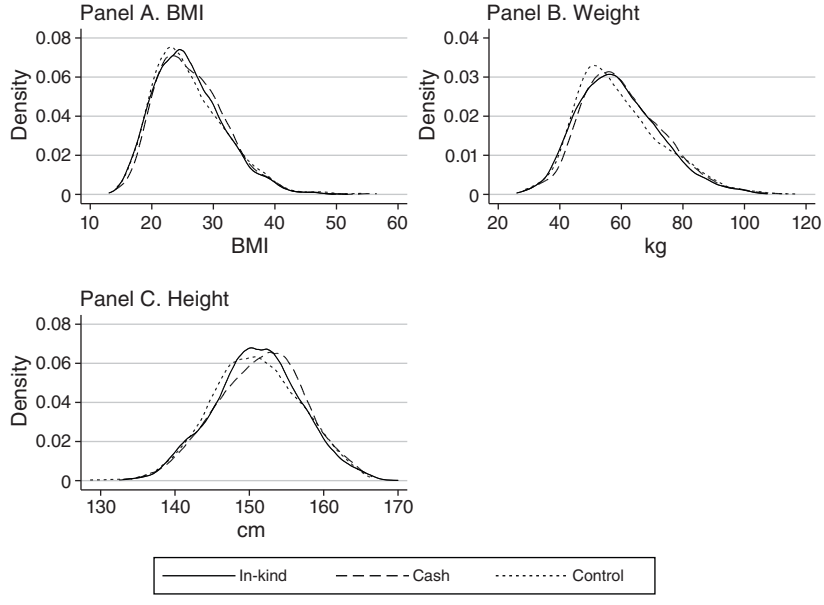

FIGURE 5. KERNEL DENSITIES OF SELECTED HEALTH OUTCOMES FOR ADULT WOMEN AGED 12 TO 51 POST-TREATMENT, BY TREATMENT GROUP

children, I also present results in Table 10 for children aged zero and one years old. As for the entire sample of children, there are no absolute or differential effects of either transfer type on weight.

Considering height for the entire sample of children (column 3), in-kind transfers appear to have caused larger gains than did cash: the difference between in-kind and cash treatment effects is 0.67 cm, significant at the 5 percent level. However, this increase is again small in economic terms, representing only about a 1 percent increase over baseline. Furthermore, it appears that the differential increase in height is concentrated among children aged two through six (column 4): for the youngest children, in-kind and cash transfers lead to virtually the same (insignificant) increase in height.[19]

It is possible that BMI may more accurately capture the effects of transfers on children's physical development. Column 5 of Table 10 contains treatment effects on the BMI z-score of children aged two to six using as a reference group the 2000 CDC US population. Echoing the results for weight, there is no significant effect on BMI under either transfer type relative to the control, and no significant difference between transfer types (p-value $= 0.41$). BMI is not commonly used to characterize the physical stature of children under two years of age; however, in unreported results, I find that there are no differential treatment effects when using weight-for-age and height-for-age as outcomes among the zero to two year old sample.

[19] It is worth noting that a possible explanation for why we may see significant absolute effects of either transfer for older children and not for young children is that the parents may choose to focus resources on those children with the most observable deficits, which are more likely to be noticeable in older children.

It is important to note that an increase in weight in this population may not be universally optimal. As noted by Leroy et al. (2010), some children in this population were overweight absent the program and perhaps providing food to overweight children is not the best use of public funds. Panel A of Figure 4 shows that among the control group post-treatment, BMI is normally distributed slightly to the right of the mean of the reference population. However, it is clear that the distributions of BMI in the cash and in-kind groups post-treatment are virtually identical in shape to that of the control, with only a slight rightward shift in the cash group. Panels B and C of Figure 4, which contain the distributions of weight and height for children aged zero to six post-treatment by treatment group, confirm this finding. The distributions are quite similar across treatment category, suggesting that the null to small mean differences in treatment effects between cash and in-kind transfers are not masking heterogeneous effects at different parts of the distribution.

Turning to self-reported sickness, point estimates show that the likelihood of being sick in the last month for all children decreased by a significant 7 and 10 percentage points for in-kind and cash transfers, respectively. These decreases are economically significant, reflecting an approximately 15 percent decrease in sickness from baseline, and the decreased sickness may be a result of the increased vitamin C intake, which has been shown to improve immune system function (Hemilä 1992). Importantly, there is no difference in treatment effects between cash and in-kind transfers (p-value $= 0.48$). Similar (and noisier) estimates on sickness result for zero and one year olds.

Finally, while not statistically significant, the point estimates suggest that anemia prevalence was reduced by a similar amount under both treatments compared to the control (a 1 percentage point decrease under in-kind and a 2 percentage point decrease under cash), reflecting decreases in the prevalence of anemia of approximately 5 to 10 percent of the prevalence in the control group. It appears that the rather large increase in the percentage of children that consumed above the RDA for iron under in-kind transfers (11 percentage points) did not translate into lower rates of anemia. (This conclusion is robust to using blood hemoglobin levels, rather than anemia prevalence, as an outcome.)

For adult women, there again appears to be little effect of either transfer type on health outcomes, and importantly, no differential effect between transfer types. Columns 1 and 2 of Table 11 show that there were insignificant and economically small effects on weight and height, indistinguishable across transfer type (p-values of 0.62 and 0.48, respectively). Indeed, the sample includes both adolescent and adult women, and it is unlikely that height will be affected for mature women. In unreported results, I find that there are also no absolute or differential effects on height when restricting the sample to women aged 12 to 21. Column 3 shows that BMI was not significantly impacted by either treatment, with insignificant increases of 0.18 and 0.15 under the in-kind and cash treatment. Finally, there were no absolute impacts on the likelihood of being sick in adult women, and also no differential impacts between treatments (p-value $= 0.60$).

As with the sample of children, it does not appear that the mean treatment effect shown in Table 11 are masking heterogeneous effects across the distribution of outcomes. This can be seen in Figure 5, which contains the distributions of BMI,

weight, and height for the adult women population. It is clear that in all three panels, the distributions across treatment type match closely.

Taken as a whole, the evidence suggests that there is little differential effect on precisely measured indicators of children's and women's health after one year of treatment between PAL in-kind and cash transfers as implemented.

V. Distribution Costs

While the main focus of this paper is to test whether the paternalistic motivation for transfers is justified, it is instructive to examine the differential distribution costs between cash and in-kind PAL transfers. Any paternalistic benefits of in-kind transfers must be compared to all differential costs, and high distribution costs of in-kind transfers is an oft-cited rationale for the use of cash.[20]

In-kind transfers, when goods are provided rather than vouchers, necessitate extra procurement, storage, and transportation costs, relative to cash. For PAL transfers during the experimental intervention, it proves difficult to account for nondistribution costs, such as salaries for staff to assemble the packages and operation costs for warehouses where the packages were made and stored, as these costs were borne by PAL's parent organization, Diconsa. Regardless, pure distribution costs of moving the goods to villages from Diconsa warehouses have been estimated to be about 30 pesos per box—or 20 percent of the wholesale cost of the transfer to the government (Yarahuán 2006).

For similar reasons relating to the interconnectedness of PAL and Diconsa, specific information on the distribution costs of cash transfers is not available. However, PAL cash transfers were distributed in the same manner as Mexico's flagship cash transfer program, *Progresa/Oportunidades*, and we do have good evidence on distribution costs from this program. Specifically, Caldés, Coady, and Maluccio (2006) report that it costs 2.4 percent of the transfer amount in order to deliver cash to recipients (*Progresa/Oportunidades* transfer amounts are roughly similar in magnitude to PAL cash transfers). Applying this estimate to PAL implies a lower-bound on the extra distribution cost of in-kind over cash transfers of 17.6 percent of the transfer amount.

Importantly, small cash distribution costs and large in-kind distribution costs are not unique in the developing world. For example, Caldés, Coady, and Maluccio (2006) also report that large government cash transfer programs in Honduras and Nicaragua have distribution costs of about 5 percent of transfer amounts, while Ahmed et al. (2009) report that government cash and in-kind food transfers in rural Bangladesh cost about 0.15 and 20 percent of transfer amounts, respectively. Regardless of any benefits of in-kind over cash transfers, these differences in distribution costs are too large to be ignored.

[20] Corruption is another potential cost and, to varying degrees, in-kind and cash transfers are both certainly susceptible. While I have no evidence on corruption under either PAL transfer type, discussions with program administrators suggest that corruption is not a large concern in this particular setting.

VI. Conclusion

Transfers to the poor play an important role in the economies of developed countries; as lower-income countries develop, pressure for such redistributive transfers will likely increase. This paper highlights important issues in program design when policymakers are concerned that unrestricted cash transfers will not be spent in a manner consistent with their paternalistic preferences. In the context of the Mexican government's food assistance program to the rural poor, the *Programa de Apoyo Alimentario* (PAL), I demonstrate how these issues can be examined through the use of detailed surveys and a properly designed experiment that randomly assigns in-kind and cash transfers.

For one, it is important to consider that in-kind transfers, compared to cash, may be a blunt policy instrument. First, in-kind transfers can be infra-marginal and, thus, have no effect on consumption. Further, if transfers happen to be extra-marginal, recipients have an incentive to sell or trade away the over-provided goods; and even if extra-marginal transfers are consumed, recipients have an incentive to substitute away from similar nontransferred items.

I find that the PAL in-kind transfers have minimal differential effects on consumption compared to equal-valued cash transfers. In terms of overall food consumption, there was no differential effect between transfer types. For individual PAL foods, some were extra-marginal and binding (such as powdered milk), but most were for the large part infra-marginal (such as vegetable oil or rice). When faced with distorting transfers, I find that recipients substituted away from similar nontransferred foods.

Furthermore, it is important to consider that paternalistic preferences are most likely defined over outcomes other than the consumption of the in-kind goods *per se*, and that households may find it more efficient to achieve those outcomes through consumption of nontransferred goods. In the case of food transfers, policymakers are most likely concerned with health outcomes, not the specific foods they supply. For PAL recipients, I find that cash was largely spent on nutritious foods, such as fruits and vegetables, and on essential nonfood goods such as medicine. It would be difficult to argue that these goods do not further the paternalistic preferences that motivated in-kind provision.

In terms of nutrition and health, both transfer types led to greater consumption of essential micronutrients by both children and their mothers, but the increases of larger magnitude under the in-kind transfer appear to have had a more meaningful impact with significantly more individuals consuming above the recommended dietary allowance. However, there is little evidence that the increased consumption of iron and zinc led to differential short-term effects of cash and in-kind transfers on the health of children or adult women.

It is important to note, however, that the available data only allow me to explore program effects after one year of receiving transfers, and health effects of increased micronutrient consumption could appear in the longer run. Furthermore, I do not observe data on children's cognitive development or motor skills, outcomes which have been shown to be effected by cash transfers in other contexts (Fernald, Gertler, and Neufeld 2008; Macours, Schady, and Vakis 2012). Certainly, differential effects

of in-kind versus cash transfers in these or any other dimensions could justify one instrument over the other for a given set of social preferences.

Regardless, a final important finding is that these poor, rural households did not indulge in vices (such as alcohol or tobacco) or nonnutritious foods upon receipt of unrestricted cash transfers, information that offers specific evidence to paternalistic policy makers who fear such adverse effects of cash transfers.

REFERENCES

Ahmed, Akhter U., Agnes R. Quisumbing, Mahbuba Nasreen, John F. Hoddinott, and Elizabeth Bryan. 2009. "Comparing Food and Cash Transfers to the Ultra Poor in Bangladesh." International Food Policy Research Institute (IFPRI) Research Monograph 163.

Akerlof, George A. 1978. "The Economics of 'Tagging' as Applied to the Optimal Income Tax, Welfare Programs, and Manpower Planning." *American Economic Review* 68 (1): 8–19.

Angelucci, Manuela, and Giacomo De Giorgi. 2009. "Indirect Effects of an Aid Program: How Do Cash Transfers Affect Ineligibles' Consumption?" *American Economic Review* 99 (1): 486–508.

Attanasio, Orazio, Vincenzo Di Maro, Valérie Lechene, and David Phillips. 2009. "The Welfare Consequence of Increases in Food Prices in Rural Mexico and Colombia." http://www.homepages.ucl.ac.uk/~uctpjrt/Files/food%20prices%20mexcol%20d9_2_09.pdf.

Attanasio, Orazio, Luis Carlos Gómez, Patricia Heredia, and Marcos Vera-Hernández. 2005. "The Short-Term Impact of a Conditional Cash Subsidy on Child Health and Nutrition in Colombia." Centre for the Evaluation of Development Policies, Institute For Fiscal Studies Report Summary: Familias 03.

Attanasio, Orazio, and Alice Mesnard. 2006. "The Impact of a Conditional Cash Transfer Programme on Consumption in Colombia." *Fiscal Studies* 27 (4): 421–42.

Barquera, S., J. Rivera-Dommarco, and A. Gasca-Garca. 2001. "Policies and programs of food and nutrition in Mexico." *Salud Publica Mex* 43: 464–77.

Bearse, P., G. Glomm, and E. Janeba. 2000. "Why Poor Countries Rely Mostly on Redistribution In-Kind." *Journal of Public Economics* 75 (3): 463–81.

Behrman, Jere R., and John Hoddinott. 2005. "Programme Evaluation with Unobserved Heterogeneity and Selective Implementation: The Mexican PROGRESA Impact on Child Nutrition." *Oxford Bulletin of Economics and Statistics* 67 (4): 547–69.

Blomquist, Sören, Vidar Christiansen, and Luca Micheletto. 2010. "Public Provision of Private Goods and Nondistortionary Marginal Tax Rates." *American Economic Journal: Economic Policy* 2 (2): 1–27.

Caldés, Natàlia, David Coady, and John A. Maluccio. 2006. "The cost of poverty alleviation transfer programs: A comparative analysis of three programs in Latin America." *World Development* 34 (5): 818–37.

Campillo Garcia, José. 1998. "Norma Oficial Mexicana NOM-169-SSA1-1998, Para La Asistencia Social Alimentaria a Grupos de Riesgo." http://www.salud.gob.mx/unidades/cdi/nom/169ssa18.html.

Coate, Stephen, Stephen Johnson, and Richard Zeckhauser. 1994. "Pecuniary redistribution through in-kind programs." *Journal of Public Economics* 55 (1): 19–40.

Cunha, Jesse M. 2014. "Testing Paternalism: Cash versus In-Kind Transfers: Dataset." *American Economic Journal: Applied Economics*. http://dx.doi.org/10.1257/app.6.2.195.

Cunha, Jesse M., Giacomo De Giorgi, and Seema Jayachandran. 2011. "The Price Effects of Cash Versus In-Kind Transfers." National Bureau of Economic Research (NBER) Working Paper 17456.

Currie, Janet, and Firouz Gahvari. 2008. "Transfers in Cash and In-Kind: Theory Meets the Data." *Journal of Economic Literature* 46 (2): 333–83.

Deaton, Angus, ed. 1981. "Theoretical and empirical approaches to consumer demand under rationing." In *Essays in the Theory and Measurement of Consumer Behaviour: In Honour of Sir Richard Stone*, 55–72. Cambridge, UK: Cambridge University Press.

de Janvry, Alain, André Fargeix, and Elisabeth Sadoulet. 1991. "The political feasibility of rural poverty reduction." *Journal of Development Economics* 37 (1–2): 351–67.

Epple, Dennis, and Richard E. Romano. 1996. "Public Provision of Private Goods." *Journal of Political Economy* 104 (1): 57–84.

Fernald, Lia C.H., Paul J. Gertler, and Lynnette M. Neufeld. 2008. "Role of cash in conditional cash transfer programmes for child health, growth, and development: an analysis of Mexico's *Oportunidades*." *Lancet* 371 (9615): 828–37.

Fraker, Thomas M., Alberto P. Martini, and James C. Ohls. 1995. "The Effect of Food Stamp Cashout on Food Expenditures: An Assessment of the Findings from Four Demonstrations." *Journal of Human Resources* 30 (4): 633–49.

González-Cossio, T., J. Rivera-Dommarco, J. P. Gutiérrez, S. Rodríguez, Diego González, M. Unar, J. Leroy, and S. Bertozzi. 2006. "Evaluación del estado de nutrición de niños menores de 5 años y sus madres, y gasto en alimentos de familias de localidades marginales en México. Análisis comparativo de la entrega de despensas y transferencias en efectivo 2003–2005." http://www.oportunidades.gob.mx:8010/es/wersd53465sdg1/palprev/pal06_eval_impacto_edo_nutricion_insp.pdf.

Hemilä, Harri. 1992. "Vitamin C and the common cold." *British Journal of Nutrition* 67 (1): 3–16.

Hoddinott, John, and Emmanuel Skoufias. 2004. "The Impact of PROGRESA on Food Consumption." *Economic Development and Cultural Change* 53 (1): 37–61.

Hoynes, Hilary W., and Diane Whitmore Schanzenbach. 2009. "Consumption Responses to In-Kind Transfers: Evidence from the Introduction of the Food Stamp Program." *American Economic Journal: Applied Economics* 1 (4): 109–39.

Islam, Mahnaz, and John Hoddinott. 2009. "Evidence of Intrahousehold Flypaper Effects from a Nutrition Intervention in Rural Guatemala." *Economic Development and Cultural Change* 57 (2): 215–38.

Jacoby, Hanan G. 2002. "Is There an Intrahousehold 'Flypaper Effect'? Evidence From a School Feeding Programme." *Economic Journal* 112 (476): 196–221.

Lee, David S. 2009. "Training, Wages, and Sample Selection: Estimating Sharp Bounds on Treatment Effects." *Review of Economic Studies* 76 (3): 1071–1102.

Leroy, Jeff L., Paola Gadsden, Sonia Rodriguez-Ramirez, and Teresa Gonzalez de Cossio. 2010. "Cash and In-Kind Transfers in Poor Rural Communities in Mexico Increase Household Fruit, Vegetable, and Micronutrient Consumption but Also Lead to Excess Energy Consumption." *Journal of Nutrition Community and International Nutrition* 140 (3): 612–17.

Macours, Karen, Norbert Schady, and Renos Vakis. 2012. "Cash Transfers, Behavioral Changes, and Cognitive Development in Early Childhood: Evidence from a Randomized Experiment." *American Economic Journal: Applied Economics* 4 (2): 247–73.

Maluccio, John. 2010. "The Impact of Conditional Cash Transfers on Consumption and Investment in Nicaragua." *Journal of Development Studies* 46 (1): 14–38.

Moffitt, Robert. 1983. "An Economic Model of Welfare Stigma." *American Economic Review* 73 (5): 1023–35.

Moffitt, Robert. 1989. "Estimating the Value of an In-Kind Transfer: The Case of Food Stamps." *Econometrica* 57 (2): 385–409.

Neary, J. P., and K. W. S. Roberts. 1980. "The theory of household behaviour under rationing." *European Economic Review* 13 (1): 25–42.

Nichols, Albert L., and Richard J. Zeckhauser. 1982. "Targeting Transfers through Restrictions on Recipients." *American Economic Review* 72 (2): 372–77.

Rodríguez Herrero, Hipólito. 2005. "Evaluación cualitative del Programa de Apoyo Alimentario." http://www.oportunidades.gob.mx:8010/es/wersd53465sdg1/palprev/pal05_eval_cuali_informe_final_ciesas.pdf.

Skoufias, Emmanuel, Mishel Unar, and Teresa Gonzalez-Cossio. 2008. "The Impacts of Cash and In-Kind Transfers on Consumption and Labor Supply: Experimental Evidence from Rural Mexico." World Bank Policy Research Working Paper Series 4778.

Southworth, Herman M. 1945. "The Economics of Public Measures to Subsidize Food Consumption." *Journal of Farm Economics* 27 (1): 38–66.

Tabor, Steven R. 2002. "Assisting the Poor with Cash: Design and Implementation of Social Transfer Programs." http://info.worldbank.org/etools/docs/library/80703/Dc%202002/courses/dc2002/readings/taborcash.pdf.

Tesliuc, Emil. 2006. "Social Safety Nets in OECD Countries." World Bank Social Safety Nets Primer Notes 25.

Tobin, James, and H. S. Houthakker. 1950. "The Effects of Rationing on Demand Elasticities." *Review of Economic Studies* 18 (3): 140–53.

Vázquez-Mota, Josefina Eugenia. 2004. "Reglas para la Operación 2004 del Programa de Apoyo Alimentario a cargo de DICONSA, S.A. de C.V. para el Ejercicio Fiscal 2004." http://www.funcionpublica.gob.mx/scagp/dgorcs/reglas/2004/r20_sedesol04/completos/ro_apoyoalimentario_04.htm.

Whitmore, Diane. 2002. "What Are Food Stamps Worth?" Princeton University Industrial Relations Section Working Paper 468.

Yarahuán, Gabriela Pérez. 2006. "Estudio de Evaluación Externa del Programa de Apoyo Alimentario a cargo de DICONSA S.A. de C.V." http://www.2006-2012.sedesol.gob.mx/work/models/SEDESOL/Resource/1662/1/images/sintesis_ejecutiva.pdf.