POLICY RESEARCH WORKING PAPER 4282

IMPACT EVALUATION SERIES NO. 17

Are Cash Transfers Made to Women Spent Like Other Sources of Income?

Norbert Schady
José Rosero

The World Bank
Development Research Group
Human Development and Public Services Team
July 2007

Policy Research Working Paper 4282

Abstract

How cash transfers made to women are used has important implications for models of household behavior and for the design of social programs. In this paper, the authors use the randomized introduction of an unconditional cash transfer to poor women in rural Ecuador to analyze the effect of transfers on the food Engel curve. There are two main findings. First, the authors show that households randomly assigned to receive Bono de Desarrollo Humano (BDH) transfers have a significantly higher food share in expenditures than those that were randomly assigned to the control group. Second, they show that the rising food share among BDH beneficiaries is found among households that have both adult males and females, but not among households that only have adult females. Bargaining power between men and women is likely to be important in mixed-adult households, but not among female-only households, where there are no men to bargain with. Finally, the authors show that within mixed-adult households, program effects are only significant in households in which the initial bargaining capacity of women was likely to be weak. This pattern of results is consistent with an increase in the bargaining power of women in households that received BDH transfers.

This paper—a product of the Public Services Team, Development Research Group—is part of a larger effort in the group to evaluate the impact of social programs. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Imran Hafiz, room MC3-311, telephone 202-473-7851, fax 202-522-1154, email address ihafiz@worldbank.org. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The authors may be contacted at nschady@worldbank.org. July 2007. (28 pages)

Produced by the Research Support Team

Are Cash Transfers Made to Women Spent Like Other Sources of Income?[♣]

Norbert Schady
World Bank
Washington, DC, USA
nschady@worldbank.org

José Rosero
Secretaría Técnica del Frente Social
Quito, Ecuador

JEL Codes: I32, I38

[♣] We thank Harold Alderman, Caridad Araujo, Orazio Attanasio, Kathleen Beegle, Angus Deaton, Eric Edmonds, Francisco Ferreira, Deon Filmer, Sebastian Galiani, John Hoddinott, Elizabeth King, Peter Lanjouw, David McKenzie, Christina Paxson, and Martin Ravallion for their comments. Any remaining errors are our own. The findings in this paper do not necessarily represent the views of the World Bank or the Government of Ecuador.

1. Introduction

Cash transfer programs have become increasingly popular in developing countries. This paper analyzes the effect of a cash transfer program in rural areas in Ecuador, the *Bono de Desarrollo Humano* (BDH), on the food Engel curve. The BDH makes US $15 monthly cash transfers to poor women. During the roll-out of the BDH program, a group of eligible households was randomly assigned into a "treatment" group eligible for transfers and a "control" group that was ineligible for the study period. Data on both groups were collected at baseline, before households started receiving transfers, and at follow-up, approximately 18 months later. This experimental design allows us to analyze whether transfers made by the BDH are spent like other sources of income.

In the textbook example, all household members maximize a join utility function (Becker 1981). A cash transfer shifts out the household budget constraint. The composition of expenditures then changes as households move along the Engel curve that relates expenditures on a particular item or group of items to total expenditures. Neither the source of the additional income nor who within the household receives the transfer matters.

In practice, there are a variety of reasons why cash transfers like those made by the BDH may be used differently from other sources of income. If transfer income is seen as more temporary or uncertain than other sources of income, a higher fraction of it might be saved or invested—for example, by purchasing productive assets. Indeed, the permanent income hypothesis suggests that *all* of the additional "windfall" income would be saved.

Even though transfers made by the BDH came with no strings attached, it was marketed as a "social program". During the roll-out of the program, a brief advertising campaign was launched, including informational spots on national television and in local radio stations. These spots stressed that the BDH was a program that was meant to benefit poor children. The advertising campaign may have led households to spend transfers in a way that took account of the goals of the program. Recent research in psychology and economics shows that considerations such as "fairness" and "reciprocity" may be important determinants of decision-making, and that individuals keep "mental accounts" in their expenditures (see, in particular Thaler 1999, as well as the review papers by Fehr and Gachter 2000, Fehr and Schmidt 2007, and the edited volume by Kahneman and Tversky 2000). In the United States, studies of food stamp "cashouts" show that families spend more of their food stamp income on food than is the case for other sources of income (Fraker, Martini, and Ohls 1995; Currie 1998). Kooreman (2000) finds that spending on children's clothing out of child benefit income in the Netherlands is much larger than out of other income. Jacoby (2002) argues that there are also "flypaper effects" associated with a school feeding program in the Philippines. On the other hand, Edmonds (2002) fails to reject the null that child benefit income is used like other income in

Slovenia. Case and Deaton (1998) conclude that pension income is spent in the same way as other sources of income in South Africa, so that "a rand is always a rand".

The gender of recipients of cash transfers like those made by the BDH may also be important in determining how transfer income is used. If pooling of resources within the household is incomplete, as predicted by a variety of non-unitary household models (for example, Chiappori 1988; 1992; Bourguignon et al. 1993), cash transfers to women may increase their bargaining capacity within the household and result in a pattern of expenditures that better reflects their preferences. A handful of papers provide evidence that women have different preferences over expenditures from men. Thomas (1990) uses data for urban Brazil to show that the effect of non-earned maternal income on nutrient demand is between four and seven times larger than the corresponding effect of non-earned paternal income. Hoddinott and Haddad (1995) argue that the share of income controlled by women is positively correlated with food shares in Cote d'Ivoire. Doss (2005) shows that the share of assets and the share of land owned by women are positively associated with higher food expenditures among rural households in Ghana. Lundberg, Pollack, and Wales (1997) exploit a sudden, unanticipated policy reform in the United Kingdom. In this reform, a universal child benefit, which had primarily consisted of reductions in taxes withheld from the paycheck of a child's father, was replaced by a direct cash payment made to the child's mother. Lundberg, Pollack, and Wales argue that this reform led to a substantial increase in expenditures on women's clothing and children's clothing relative to men's clothing—see also Ward-Batts (2003) for another paper that reaches similar conclusions with the same data. On the other hand, Hotchkiss (2005) shows that childless couples, who were unaffected by the reform, also had large increases in expenditures on women's clothing, which casts doubts on the Lundberg, Pollack and Wales identification strategy.

There are also a handful of papers that analyze the effect of "conditional cash transfer" programs in Latin America. In these programs, women receive transfers only if they comply with a number of conditions—women with pre-school-aged children must make regular visits to health centers, where children receive growth monitoring and food supplements, if necessary, and women with school-aged children must ensure that they are enrolled in school and attend regularly. The best known of these programs is the *PROGRESA* program in Mexico (now called *Oportunidades*).

A number of papers analyze the impact of *PROGRESA* on expenditures, and arrive at different conclusions. Hoddinott and Skoufias (2004) use the random assignment of *PROGRESA* to poor communities to show that households eligible for transfers consumed more food than non-eligible households; however, Hoddinott and Skoufias do not analyze changes in the food share, so it is not clear whether the increase in food expenditures is a result of higher incomes or changes in consumption patterns. Attanasio and Lechene (2002) explicitly focus on the shares of expenditures

on different goods, including food. Their analysis leads them to reject the income pooling hypothesis. Using a variety of instrumental-variables techniques that exploit the randomized introduction of the program, they conclude that households that received *PROGRESA* transfers had significantly higher food shares in expenditures. Rubalcava, Teruel, and Thomas (2004) also analyze the impact of *PROGRESA* on the composition of expenditures, and conclude that transfers were more likely to be invested, and were more likely to be spent on goods that benefited children, than other sources of income. Moreover, they show that changes in the composition of expenditures among *PROGRESA* beneficiaries were absent in single-parent households, which could be consistent with a bargaining power explanation. Unlike Attanasio and Lechene, however, Rubalcava, Teruel, and Thomas conclude that *PROGRESA* beneficiaries had lower (rather than higher) food shares in expenditures after the program.

Turning to other conditional cash transfer programs in Latin America, Attanasio and Mesnard (2005) use non-experimental methods to analyze the impact of the Colombian *Familias en Acción* program; they show that the program increased food expenditures by the same fraction as total expenditures—the Engel curves remained unchanged. Finally, Maluccio and Flores (2004) exploit the random assignment of benefits in the *Red de Protección Social* program in Nicaragua. They show that households that were eligible for transfers had significantly higher food shares in expenditures.

How conditional cash transfers are used by households is an important policy question. However, analysis of conditional cash transfers does not in and of itself provide a straightforward test of the pooling hypothesis. This is because the conditions attached to transfers are likely to affect the pattern of expenditures—see, in particular, the discussion in Attanasio and Lechene (2002). The fact that the BDH did not require women to comply with any "conditions" to receive transfers arguably provides a cleaner test of whether the simple textbook model of the household is an accurate approximation to reality.

In this paper we focus on differences in the share of expenditures devoted to food between households randomly assigned to receive BDH transfers—lottery winners—and households randomly assigned to the control group—lottery losers. The main findings of the paper are two. We first show that BDH lottery winners have a significantly higher food share in expenditures than lottery losers. As is discussed above, this is in principle consistent with a variety of explanations. We then show that the pattern of program effects is generally consistent with an increase in the bargaining capacity of women.

To analyze whether the gender of recipients was important, we split the sample into households that have both adult men and women, and those that have adult women only. If the rising food share among BDH beneficiaries were a result of the increasing bargaining power of women, we

would expect to see increases in the food Engel curve among mixed-adult households, where bargaining is an issue, but not among female-only households, where there are no men to bargain with. This is in fact the pattern of program effects we find. We might also expect that the BDH would have the largest effects in mixed-adult households in which the initial control of women over resources was weak. Although there is no direct measure of bargaining capacity within the household in our data, the relative education of men and women is likely to be a reasonable proxy—see Frankenberg and Thomas (2003) for a general discussion, and Beegle, Frankenberg, and Thomas (2001) for an application. We show that, among mixed-adult households, BDH program effects are larger when women have less schooling than men.

The rest of the paper proceeds as follows. In section 2, we describe the data and the BDH evaluation experiment. Section 3 discusses our methodology and presents results. We conclude in section 4.

2. Program design, evaluation, and data[1]

A. The BDH program

Ecuador has had a nationwide cash transfer program in place for approximately a decade. The first of these programs, the *Bono Solidario*, was created in 1998. Its goal was to make transfers to poor households as Ecuador recovered from an economic crisis. (GDP per capita contracted by 7.7 percent between 1998 and 1999.) As originally envisioned, transfers made by the *Bono Solidario* were meant to be temporary. In practice, however, the program continued well after recovery from the crisis.

Individual payments made by the *Bono Solidario* program were small—$15 per month per eligible family—but the scope of the program was large: In 2002, it accounted for approximately 0.75 percentage points of GDP. (Ecuador adopted the US dollar as national currency in January 2000.) Payments were intended to be made to poor households. However, because there were no clear selection criteria, households essentially signed up on a first-come, first-served basis. As a result, many poor households did not receive transfers, and a substantial fraction of transfers were received by non-poor households. In 1999, 49.8 percent of families in the poorest quintile received transfers, and 27.4 percent of families in the top two wealthiest quintiles received transfers. (These statistics are based on calculations from household survey data using the nationally representative 1999 Ecuador *Encuesta de Condiciones de Vida,* the multi-purpose household survey intermittently conducted in Ecuador.)

[1] This section borrows considerably from the descriptions in Schady and Araujo (2006) and Paxson and Schady (2007).

Beginning in mid-2003, the *Bono Solidario* was gradually replaced with a new program, the *Bono de Desarrollo Humano* (BDH). The BDH differs from the *Bono Solidario* in that it is means-tested. Starting in 2001, the government of Ecuador invested significant effort into developing a family means-test. Fully 85 percent of families in rural areas and poorer urban areas of Ecuador were surveyed and assigned a poverty index (called the Selben index). This index is used to assess eligibility for the BDH—only families in the first two quintiles of the Selben index are eligible for transfers of $15 per month.[2] BDH transfers are relatively small in magnitude—in our sample, they account for approximately 8.9 percent of expenditures of the median household. Transfers are made through the banking system. The program rules state that transfers must be made to women if there are any adult women in the household, and women must physically go to a nearby bank to receive cash.[3] (There is a much smaller version of the program that covers the elderly, regardless whether they are men or women; these households are not included in our sample.)

Earlier work on the BDH program has focused on its impact on overall consumption, schooling, and child health and development. A joint document by the World Bank and the *Secretaría Técnica del Frente Social* (2006) in Ecuador shows that households that received BDH transfers did not have significantly higher overall per capita consumption. This is surprising, but can be explained, in an accounting sense, by large reductions in child labor among households that received transfers. This same analysis finds no evidence of changes in adult labor market participation. Schady and Araujo (2006) show that the BDH program had a large, positive effect on school enrollment. Finally, Paxson and Schady (2007) show that BDH transfers resulted in improvements in measures of nutritional status, motor development, cognitive development, and psycho-emotional development among children of pre-school age in rural areas, especially among the poorest households. There is no earlier work on the effect of BDH transfers on the composition of household expenditures.

B. The experiment

In a similar fashion to the roll-out of *PROGRESA*, an evaluation design was explicitly incorporated into the BDH. The sample for this evaluation was drawn from the Selben rosters of four of the 22 provinces in the country: Carchi, Imbabura, Cotopaxi, and Tungurahua. All four provinces are in the sierra (or highlands) region of the country. The sampling framework followed a two-stage

[2] In January 2007, the administration of newly-elected President Rafael Correa announced that transfers to all eligible households would be doubled from $15 per month to $30 per month. However, this reform falls well after the time period considered in our study.

[3] There are only 4 households in our sample that receive BDH transfers in spite of the fact that there are no adult women in the household.

process. Within the provinces in the evaluation, parishes were randomly drawn and, within these parishes, a sample of 1,488 households was randomly selected. (Parishes are the lowest geographic unit in Ecuador, roughly equivalent to counties in the United States.) Households that had previously received transfers from the *Bono Solidario* were excluded from the sample, as were households whose Selben score made them ineligible fir the BDH. One-half of households in the sample were randomly assigned to a treatment group, and the other half to the control group. We refer to the first group as "lottery winners" and the second group as "lottery losers". Lottery losers were taken off the roster of households that could be activated for BDH transfers. Note that households in the two groups lived in the same neighborhoods or villages—unlike the evaluation of *PROGRESA* and most other cash transfer programs in Latin America, where random assignment took place at the community level.

Table 1 uses data from the baseline survey to compare the characteristics of households that were randomly assigned to treatment and control groups (upper panel), and those that received and did not receive BDH transfers (lower panel). The upper panel of the table shows that random assignment was successful: Differences between lottery winners and lottery losers at baseline in a number of characteristics—including expenditure patterns, the food share, household size, and the characteristics of the household head—are small, and are not significant at conventional levels.

Although random assignment was successful, there is unfortunately a very imperfect match between assignment to a study group and receipt of BDH transfers. Program take-up among lottery winners was 78 percent; lack of information, the cost of traveling to a bank, and stigma may all have discouraged some households from receiving transfers. More worryingly, 42 percent of households assigned to the control group received transfers. The precise reasons for this substantial contamination are unclear. Conversations with BDH administrators suggest that the list of households that had been randomized out was not passed on in time to operational staff activating households for transfers. This situation was corrected after a few weeks, but withholding transfers from households that had already begun to receive them was judged to be politically imprudent (see Schady and Araujo 2006).

The lower panel of Table 1 shows that there are clear baseline differences between households that received BDH transfers and those that did not. Households that received transfers had lower food expenditures and lower food shares; they tended to be larger; the heads of households that received transfers had an average of two-thirds of a year of more education, are approximately two years younger, and are somewhat more likely to be male. Many of these differences are significant. Table 1 clearly suggests that the likelihood of receiving BDH cannot be treated as random, and that it is important to use estimation methods that take this into account.

How do households in our sample compare with other households in Ecuador? Because of the criteria for selection into the BDH evaluation, households in the study sample tend to be poorer. Table 2 reports the means and standard deviations for selected characteristics of households in the study sample at baseline, for all households in the country, and for all households in the parishes included in this study. The samples for these calculations are limited to households with children ages 6-17. National averages are based on the 1999 *Encuesta de Condiciones de Vida*, and averages for the parishes in the study sample are based on the 2001 Population Census. Table 2 shows that households in the sample have more members and fewer rooms than other households, are less likely to have access to piped water or a toilet, and are more likely to have a dirt floor in their home. Mean years of schooling of household heads in the study sample are more than two-and-a-half years lower than those of other households. These patterns are apparent both in comparison with other households in these same parishes, as well as in comparison with national averages.

C. Data

The main sources of data used in this paper are the baseline and follow-up surveys designed for the BDH evaluation. Both surveys were carried out by an independent firm that had no association with the BDH program, the *Pontificia Universidad Católica del Ecuador.* The baseline survey was collected between June and August 2003, and the follow-up survey was collected between January and March 2005. The analysis in this paper is limited to households living in rural areas.

The survey instrument included a roster of household members and, *inter alia*, information on the level of schooling attained, marital status, and languages spoken by all adults; school enrollment, grade progression, and work of all children ages 6-17; an extensive module on household expenditures, which closely followed the structure of the 1999 *Encuesta de Condiciones de Vida*; and a module on dwelling conditions, ownership of durable goods, and access to public services. We aggregated expenditures into a total consumption aggregate, and food expenditures into a food consumption aggregate. Food consumption includes both actual expenditures (including food consumed outside the home), as well as home production in the two weeks prior to the survey. Other expenditures include modules on schooling, health, entertainment, items for personal hygiene, clothing, shoes, transportation, services, and expenditures on durables. The items asked in the expenditure module, and the recall periods for each item, are exactly the same in the two surveys. We deflated prices across provinces using data on the prices of a basket of food items collected at the time of the baseline survey, and used the Consumer Price Index (CPI) to make the prices comparable between the two surveys.

There are 773 households in rural areas in the BDH evaluation surveys that were visited in both the baseline and follow-up surveys. Attrition over the study period was low: 94.1 percent of households were re-interviewed. Among households who attrited, most had moved and could not be found (4.2 percent), with smaller numbers where the household was located but no qualified respondent was available despite repeated visits (1.0 percent), or the respondent refused to participate in the survey (0.5 percent). There is no relation between assignment to the study groups and attrition, and baseline differences between attrited and other households in per capita expenditures, food expenditures, assets, and the education of adult males and females are small and insignificant. Attrition is most likely to introduce biases in estimation when there are large differences between attrited and other households (Fitzgerald, Gottschalk and Moffitt 1998), or when attrition is correlated with treatment status (Angrist 1997; Angrist et al. 2002), and there is no evidence that this is the case in our data.

3. Results

A. Nonparametric results

We begin our analysis with non-parametric regressions of the food share on the log of per capita expenditures at baseline and follow-up for households assigned to the treatment group—lottery winners—and households assigned to the control group—lottery losers. These results are presented in Figure 1. Note that this analysis only makes use of the random assignment into treatment and control groups, and not of the likely endogenous program take-up.

The food Engel curves in Figure 1 generally present the typical downward-sloping pattern observed elsewhere. With the exception of the poorest households, households with higher overall expenditures generally have lower food shares—Engel's Law (Engel 1857). The positive slope in the food Engel curve observed at the lowest expenditure levels is not uncommon (Thomas 1986), and has been documented before for Ecuador (Lanjouw and Lanjouw 1997). One explanation that is consistent with this pattern is measurement error in food expenditures: If households buy some food items infrequently, for example because they buy in bulk, some households will not have purchased these items during the recall period considered in the surveys (the last two weeks). These households will appear to have low overall expenditures and particularly low food expenditures (Lanjouw and Lanjouw 1997).

By virtue of random assignment, we would expect that the food Engel curves at baseline for lottery winners and losers would be very close to each other. The upper panel of Figure 1 shows that this is generally the case above the 25th percentile of the distribution of log per capita expenditures. However, despite random assignment, the food Engel curve for the poorest lottery winners is below

that of the poorest lottery losers—on average, the difference in food shares between the two groups for households in the lowest quartile is 2.8 percentage points. We return to this point below.

If BDH transfers were treated like other sources of income, households might move along their Engel curves in response to the program, although the fact that the program did not have an effect on total expenditures suggests that movement along the curves would be small. Under this scenario, the curves for lottery winners and lottery losers at follow-up would look very similar to those at baseline. The lower panel of Figure 1 shows that this is not the case. Instead, the curves for both lottery winners and lottery losers have shifted down over the two-year period. However, the shift for lottery winners is noticeably smaller.

The downward shift in the food Engel curves over time is surprising, although it has been observed elsewhere—see Deaton and Dreze (2007) for a long time-series in India, and Maluccio and Flores (2004) in their analysis of the effect of the *Red de Protección Social* program in Nicaragua. To gain a better understanding of this change, we make use of the 1999 and 2006 Ecuador *Encuestas de Condiciones de Vida*. We limited the sample to households in the rural sierra, to make the coverage of the surveys comparable to that in the evaluation data, and calculated nonparametric regressions of the food share on log per capita expenditures. On average, the food Engel curve using the *Encuestas de Condiciones de Vida* in 2006 is 3.9 percentage points below that in 1999. Reassuringly, the downward shift in the food Engel curves in rural areas of the sierra in Ecuador we observe in the BDH evaluation sample is also apparent in other data sources.

We briefly discuss some possible reasons for the downward shift in the food Engel curves in Ecuador over time. First, there may have been changes in relative prices—for example, a change in the price of food, relative to other items in the household budget. Both the BDH evaluation surveys and the *Encuestas de Condiciones de Vida* collect village-level information on a basket of food items, which are then used to deflate expenditures spatially. However, neither survey collects information on the prices of non-food items, so it is not possible to use these data to assess changes in relative prices.

Seasonal patterns could also explain the decline in the food Engel curve—recall that the baseline evaluation survey was collected between June and August, while the follow-up survey was collected between January and March. The 2006 *Encuesta de Condiciones de Vida* collected data in every month of the year. The average food share in rural areas in the sierra is 0.473 in January-March period and 0.475 in the June-August period. Thus, it does not appear that seasonal effects are important.

Finally, measurement error also seems an unlikely candidate to explain the falling food Engel curve in the evaluation surveys, since the expenditure modules and recall periods were identical

across surveys, the same procedure was used to deflate expenditures spatially, and overall price levels were stable over this period—the national currency in Ecuador at the time of both surveys was the US dollar. We therefore do not have a satisfactory explanation for the secular downward shift in the Engel curve in our evaluation sample or in the rural sierra in general.

More importantly for our analysis, however, the lower panel of Figure 1 shows that the food Engel curve for lottery winners at follow-up is everywhere above that for lottery losers. Note that this is a very different pattern of what we find at baseline. Figure 1 thus suggests that BDH transfers led households to shift expenditures towards food.

B. Parametric results

We next turn to two parametric specifications of the data. In the first of these, we use only data from the follow-up survey:

(1) $W_{ht} = Z_h\delta + f(\ln(x/n))_{ht} + \mathbf{X}_{ht}\beta + \psi_c + \varepsilon_{ht,}$

where W_{ht} is the food share at the time of the follow-up survey; Z_h is a dummy variable that takes on the value of one if a family was a lottery winner; $f(\ln(x/n))_{ht}$ is a flexible formulation of per capita expenditures. In practice, we use a quadratic in expenditures—we consistently fail to find evidence that higher-order terms are important (see Attanasio and Lechene 2002, and Blundell, Banks, and Lewbell 1997 for a similar parametrization of total expenditures in Engel curve analysis); $\mathbf{X}_{ht}$ is a vector of demographic controls, including the log of household size, and indicator variables for the number of family members in 5 age ranges (0 to 5, 6 to 17, 18 to 44, 45 to 64, and 65 or older) interacted with gender; ψ_c is a vector of 45 canton fixed effects; ε_{ht}, finally, is the regression error term. Standard errors are corrected for within-parish correlation. The parameter of interest is δ, which tests for differences in the food Engel curve between lottery winners and lottery losers. Note that this is a "lottery effect" that is exogenous as it relies only on the random assignment.

There are a number of considerations that require discussion in this specification. The first of these is that estimation of (1) above allows the BDH to have an effect on the intercept but not the slope of the Engel curve. In practice we consistently fail to find evidence of BDH effects on the slope of the Engel curve, and therefore use this more parsimonious specification. A second concern is measurement error. Measurement error in per capita expenditures would bias the linear and quadratic terms in $\ln(x/n)_{ht}$ above, and could also bias estimates of the program effect on the Engel curve if per capita expenditures at follow-up are not orthogonal with participation in the BDH program. We therefore also present estimates in which total per capita expenditures (and its square) are instrumented with per capita non-food expenditures (and its square).

Another consideration is pre-existing differences between lottery winners and lottery losers that remain despite random assignment. As Figure 1 shows, there is some evidence that the food share at baseline was lower among lottery winners than among lottery losers. We therefore also run a specification in first-differences:

$$(2) \qquad \Delta W_h = Z_h\delta + \Delta f(\ln(x/n))_h + \Delta \mathbf{X}_h\beta + \psi_c + \Delta\varepsilon_{h,}$$

where Δ represents changes between baseline and follow-up. This approach sweeps out all time-invariant differences between lottery winners and lottery losers, including differences in the baseline food share.

Results from these calculations are presented in Table 3. The first four specifications are OLS. The first of these includes no controls; this specification therefore ignores any effect that BDH transfers may have had on total expenditures. The second specification includes linear and quadratic terms in the log of per capita expenditures. The third specification supplements this with the vector of demographic controls. The fourth specification also includes 45 canton fixed effects. In the fifth specification, finally, the log per capita expenditures (and its square) are instrumented with the log of nonfood expenditures (and its square).[4] The upper panel in the table presents results based on the single-difference specification, while results from the double-difference specification are reported in the lower panel.

The single-difference estimates suggest that the food share at follow-up is between 1.7 and 2.5 percentage points higher among lottery winners than among lottery losers. All of the program effects estimated by OLS are significant at the 5 percent level or better. When per capita expenditures is instrumented, the coefficient on lottery winners falls somewhat, and the standard error increases; as a result, these estimates are no longer significant at conventional levels. However, the point estimate in the IV specification is close to and well within the confidence interval of the OLS estimates. The log of per capita expenditures has the concave profile apparent in Figure 1 in the OLS specifications; once expenditures are instrumented, the food share falls monotonically with expenditures, as predicted by Engel's Law.

The double-difference estimates in the lower panel of the table are noticeably larger, as one would expect given the lower food share among lottery winners at baseline. These estimates suggest that the food share among lottery winners is between 2.9 and 4.0 percentage points higher than among lottery losers. As before, the coefficient on households randomly assigned to receive BDH transfers

[4] Non-food expenditures are highly correlated with total expenditures. In a regression of the log of total expenditures on the log of nonfood expenditures, including the demographic controls and the canton fixed effects, the coefficient on non-food expenditures is 0.459 (with a standard error of 0.011); in a comparable regression in first differences, the coefficient is 0.395 (with a standard error of 0.014).

is significant in all OLS specifications; in the IV specification the point estimate is smaller, and the standard errors are larger.

How large are these effects of the BDH on the food share? As is discussed above, there was unfortunately substantial contamination of the control group in the BDH experiment. This will tend to dampen any effect the program may have had on food shares estimated in (1) and (2). The coefficient δ can therefore best be understood as a lower bound of the underlying program effect. As an alternative, it is possible to use the randomized assignment into study groups as an instrument for actual receipt of BDH transfers (Imbens and Angrist 1994). For this purpose, we obtained data from *Banred*, the consortium of banks that pay BDH benefits, on total transfers collected by every household in the sample between January 2004 and July 2005. (Results are very similar when, instead of the banking data, we use the responses provided in the follow-up survey about receipt of BDH transfers.) As is well known, these regressions estimate Local Average Treatment Effects (LATE). These are estimates of the effect of BDH transfers on the food share for households whose probability of receiving transfers was affected by the lottery—"compliers", in the language of Angrist, Imbens, and Rubin (1996). In these regressions, the coefficient on instrumented receipt of BDH transfers implies an effect on the food share of between 6.4 and 7.4 percentage points in the single-difference estimates, and of between 10.5 and 12.6 percentage points in the double-difference regressions.[5]

We present two additional pieces of evidence that are consistent with an increase in expenditures on food by BDH lottery winners. First, we reproduce a result from the paper by Paxson and Schady (2007) on the impact of the BDH on child health and development. The follow-up survey used by Paxson and Schady asked BDH beneficiaries, all of whom were women, what they used BDH transfers for. Table 4, reproduced from their paper, shows that nearly half (49.2 percent) reported that they spent all or most of the transfer on food, with much smaller fractions reporting that they spent all or most of the transfer on clothing (11.4 percent), education (10.7 percent), and health care (7.9 percent). The survey also asked mothers who in the household (the mother, her partner or husband, or both) decided whether the transfers should be spent on food, clothing, etc. For each type of expenditure, fewer than 2 percent of women reported that her husband or partner alone made decisions on how to spend the BDH transfer, and the majority indicated that they made spending decisions alone. Second, we note that Paxson and Schady find that the BDH program resulted in

[5] The first stage is highly significant: In a regression of the dummy for households that received transfers on a dummy for lottery winners and the full set of controls, the coefficient on lottery winners is 0.347, with a standard error of 0.048.

substantial improvements in the hemoglobin status of children and their mothers, which is consistent with increased consumption of some foodstuffs, such as red meat and some fruits and vegetables.

C. Differences by the gender composition of households

As is discussed in the introduction, there are a variety of reasons why BDH transfers could have resulted in higher food shares, including uncertainty about how long transfers would be available, "mental accounting" that would take account of program goals, and the gender of transfer recipients. We cannot formally test all of these possible explanations. However, we present two pieces of evidence that suggest that the fact that BDH transfers were made to women was important.

We first focus on comparisons between households that have both adult males and females (mixed-adult households), and those that only have adult females (female-only households), where adults are defined as household members aged 18 or older. If women have preferences for food, and the increase in the food share reflects the increasing bargaining power of women over the budget, we would expect to see higher food shares among BDH recipients in mixed-adult households, where bargaining is an issue, but not among female-only households, where there are no men to bargain with. As we show, this is the pattern we find.

Second, if the rising food share in mixed-adult households reflects the increasing bargaining power of women, we would expect changes to be larger in households where the bargaining capacity of women was initially weak. We do not have a direct measure of the bargaining capacity of men and women in the household. However, the relative education of men and women in the household is likely to be a reasonable proxy. We therefore generate a variable for the mean years of schooling of adult men and (separately) adult women in the household, and divide the sample into two groups: the first group corresponds to households in which the average education of men was higher than that of women, and the second group to households in which the average education of women was equal to or higher than that of men. We then estimate BDH program effects separately in these two samples. If greater relative schooling leads to a higher bargaining capacity, as seems likely, we would expect to see larger program effects on the food share among households where women initially had (relatively) less education than in those where women had more education than men. Once again, this is the pattern of program effects we find.

As a way of motivating these results, we first run a regression of the food share at baseline on the full set of controls and a dummy variable for female-only households. In this regression, the coefficient on the female-only dummy is 0.060, with a standard error of 0.028. This coefficient has to be treated with some caution because of the possible endogeneity of household formation, and

because adult women and men may have different caloric requirements. Nevertheless, the result is consistent with women having preferences for food.

We next turn to regressions of BDH program effects on the food share for the various breakdowns of the data described above. These regressions are based on the double-difference specification, which is least likely to be biased. Also, we do not run the regressions that include canton fixed effects because of the small number of observations for some breakdowns of the data—for example, there are only 52 households that have only adult females at baseline and follow-up. The regressions that analyze BDH effects by the relative education of men and women all include a set of 13 dummy variables for the mean years of schooling of adults in the household (in integers). This is important, as mean schooling could be correlated with differences in relative schooling levels, and this could introduce biases. Finally, note that differences in caloric requirements are less likely to be a source of concern for the results in Table 5 than for the baseline regressions: The comparisons in Table 5 are between lottery winners and lottery losers—*conditional* on being a female-only or a mixed-adult household, or *conditional* on educational levels of men and women in mixed-adult households. Moreover, as is discussed above, there is no evidence that the BDH transfers affected the labor market participation of adult men or women.

The results from these calculations are summarized in Table 5. The top panel in the table presents the results from regressions for female-only and mixed-adult households. The first row shows that the program effects in female-only households are very close to zero, while the second row shows large and significant effects on the food share among mixed-adult households. The bottom panel presents the results for mixed-adult households with different amounts of relative schooling of men and women. These regressions show that program effects on the food share are only significant in households in which the average schooling of women was lower than that of men. On average, the point estimates for the sample of households in which the schooling of women was lower are about 50 percent higher than those for the sample in which the education of women was as high as or higher than that of men.

The results in Table 5 are not conclusive. The standard errors are too large for the differences in program effects across categories to be significant. Also, one would ideally want to have an experimental design in which transfers were randomly allocated to women in some households and to men in others. Keeping these caveats in mind, however, Table 5 suggests that the upward shift in the food Engel curve observed among BDH lottery winners is at least in part a result of female preferences for food, as has been argued elsewhere (Thomas 1990; Hoddinot and Haddad 1995; Doss 2005), and a greater control of women over household resources after the program was implemented, especially in households where the bargaining capacity of women was initially weak.

4. Conclusion

In the textbook model of the household, a dollar in the household budget is always a dollar, no matter where it comes from, or who within the household receives it. There are a variety of reasons why this simple model may not hold. One possibility is that the gender of recipient of cash transfers matters because women have different preferences from men, and household resources are not pooled completely.

There are a number of papers that test the unitary model of the household by comparing how resources controlled by men and women are used (for example, Thomas 1990 and 1994; Lundberg, Pollack, and Wales 1997). A key concern in this literature, and one which is discussed in these papers, is the possible endogeneity of income controlled by men and women. In this paper, we use random assignment of a cash transfer program to women in rural areas in Ecuador to analyze changes in the food Engel curve. This experimental design limits concerns with endogeneity.

The basic finding of the paper is that households that were randomly assigned to receive cash transfers have significantly higher food shares after the program. These program effects on the food share are only found among mixed-adult households, and not among female-only households. When the sample is limited to mixed-adult households, significant program effects are only found among households where the bargaining capacity of women was initially likely to be weaker. Taken together, these results are hard to reconcile with the unitary model of the household, in which all resources are pooled. Rather, they suggest that the bargaining position of women improved after they received transfers, and that women were then better able to influence the pattern of expenditures.

The food share has been used as a measure of household welfare ever since Engel's own pioneering study showed that the share of food in the budget decreases as income rises (Engel 1857). "Engel's Law" is an empirical regularity and, as Figure 1 shows, it holds in Ecuador as well. There are, however, numerous reasons why the food share is a poor welfare measure (see, in particular, the discussion in Deaton 1997). In Ecuador, households that received cash transfers, and who presumably were better off as a result, have a *higher* food share, which clearly raises doubts about the usefulness of the food share as a welfare measure. Moreover, the food Engel curves in rural Ecuador show significant downward drift. This raises questions about a variety of applications which rely on a stable food share as a critical assumption. For example, Costa (2001) uses data on the food and recreation shares in the United States over time to correct for bias in the consumer price index. Obviously, rural Ecuador and the United States are likely to differ in a large number of ways, but the results in this (and other recent) papers that show a shifting food Engel curve point to the risks inherent in assuming that the Engel curve is stable.

The findings in this paper also have operational implications. Conditional cash transfers in Latin America have received considerable attention, and with good reason. For example, *PROGRESA* has been shown to have positive effects on school enrollment (Schultz 2004; Behrman, Sengupta, and Todd 2005) and child health (Gertler 2004; Behrman and Hoddinott 2005; Rivera et al. 2004). It is generally assumed that conditional cash transfers work through some combination of an income effect and the change in relative prices associated with the condition. The analysis in this paper shows that another characteristic of these programs—the fact that transfers are made to women—may also be important. Compelling households to comply with conditions is costly both for households and for the programs that are charged with monitoring compliance, so a better understanding of what features of conditional cash transfer programs affect outcomes clearly has operational implications. More generally, the results in this paper show that the gender of participants is important for program design. To date, this has received considerable attention in some areas in development, in particular in analysis of micro-finance schemes (for example, Pitt and Khandker 1998; Morduch 1999), but less in others. It is a fruitful area for additional experimentation and research.

References

Angrist, J. 1997. "Conditional Independence in Sample Selection Models." *Economics Letters* 54(2): 103-12.

Angrist, J., G. Imbens, and D. Rubin. 1996. "Identification of Casual Effects Using Instrumental Variables." *Journal of the American Statistical Association* 91(434): 444-55.

Angrist, J., E. Bettinger, E. Bloom, E. King, and M. Kremer. 2002. "Vouchers for Private Schooling in Colombia: Evidence from a Randomized Natural Experiment." *American Economic Review* 92(5): 1535-58.

Attanasio, O., and V. Lechene. 2002. "Tests of Income Pooling in Household Decisions." *Review of Economic Dynamics* 5(4): 720-48.

Attanasio, O., and A. Mesnard. 2005. "The Impact of a Conditional Cash Transfer Programme on Consumption in Colombia." Unpublished manuscript, The Institute for Fiscal Studies, London.

Becker, G. 1981. *A Treatise on the Family*. Cambridge: Harvard University Press.

Beegle, K., Frankenberg, E., and D. Thomas. 2001. "Bargaining Power within Couples and Reproductive Health Care Use in Indonesia." *Studies in Family Planning* 32(2): 130-46.

Behrman, J., and J. 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.

Behrman, J., P. Sengupta, and P. Todd. 2005. "Progressing through Progresa: An Impact Assessment of a School Subsidy Experiment in Mexico." *Economic Development and Cultural Change* 54(1): 237-75.

Bourguignon, F., M. Browning, P. A. Chiappori, and V. Lechene. 1993. "Intra-Household Allocation of Consumption: A model and some Evidence from French Data." *Annales d' Economie et de Statistique* 29: 137-56.

Blundell, R., J. Banks, and A. Lewbell. 1997. "Quadratic Engel Curves and Consumer Demand." *Review of Economics and Statistics* 79(4): 527-39.

Case, A., and A. Deaton. 1998. "Large Cash Transfers to the Elderly in South Africa." *Economic Journal* 108(450): 1330-1361.

Chiappori, P. A. 1988. "Rational Household Labor Supply." *Econometrica* 56(1): 63-89.

Chiappori, P. A. 1992. "Collective Labor Supply and Welfare." *Journal of Political Economy* 100(3): 437-67.

Costa, D. 2001. "Estimating Real Income in the US from 1888 to 1994: Correcting CPI Bias using Engel Curves." *Journal of Political Economy* 109(6): 1288-1310.

Deaton, A. 1997. *The Analysis of Household Surveys: A Microeconometric Approach to Development Policy*. Baltimore and London: Johns Hopkins University Press.

Deaton, A., and J. Dreze. 2007. "Indian Food Puzzles: Growth, Poverty, and (mal)nutrition." Unpublished manuscript, Princeton University.

Doss, C. 2005. "The Effects of Intrahousehold Property Ownership on Expenditure Patterns in Ghana." *Journal of African Economies* 15(1): 149-80.

Edmonds, E. 2002. "Reconsidering the Labeling Effect for Child Benefits: Evidence from a Transition Economy." *Economics Letters* 76(3): 303-09.

Engel, E. 1857. “Die Productions- und consumtionsverhaeltnisse des Koenigreichs Sachsen.” In E. Engel, *Die Lebenskosten belgischer arbeiter-familien*. C. Heinrich: Dresden.

Fehr, E., and S. Gachter. 2000. “Fairness and Retaliation—The Economics of Reciprocity.” *Journal of Economic Perspectives* 14: 159-81.

Fehr, E., and K. Schmidt. 2007. “The Economics of Fairness, Reciprocity, and Altrusim.” In *Handbook of Altrusim, Gift Giving and Reciprocity*. North Holland: Amsterdam.

Fitzgerald, J., P. Gottschalk, and R. Moffitt. 1998. “An Analysis of Sample Attrition in Panel Data: The Michigan Panel Study of Income Dynamics.” *The Journal of Human Resources* 33(2): 251-99.

Frankenberg, E., and D. Thomas. 2003. “Household Decisions, Gender and Development: Measuring Power.” In A. Quisumbing., Ed., *Household Decisions, Gender and Development: A Synthesis of Recent Research*, International Food Policy Research Institute, Washington, D.C.

Gertler, P. 2004. “Do Conditional Cash Transfers Improve Child Health? Evidence from PROGRESA's Controlled Randomized Experiment.” *American Economic Review* 94(2): 331-336.

Hoddinott, J., and E. Skoufias. 2004. “The Impact of PROGRESA on Food Consumption.” *Economic Development and Cultural Change* 53(1): 37-61.

Hotchkiss, J.L. 2005. “Do Husbands and Wives Pool their Resources? Further Evidence.” *Journal of Human Resources* 40(2): 519-31.

Imbens, G., and J. Angrist. 1994. “Identification and Estimation of Local Average Treatment Effects.” *Econometrica* 62(2): 467-75.

Kahneman, D., and Tversky, A., eds. 2000. *Choices, Values, and Frames*. Cambridge University Press and the Russell Sage Foundation.

Kooreman, P. 2000. “The Labeling Effect of a Child Benefit System.” *American Economic Review* 90(3): 571-83.

Lanjouw, J., and Lanjouw, P. 1997. “Poverty Comparisons with Noncompatible Data: Theory and Illustrations.” World Bank Policy Research Working Paper 1709, Washington, D.C.

Lundberg, S., R. A. Pollack, T. J. Wales. 1997. “Do Husbands and Wives Pool their Resources? Evidence from the United Kingdom Child Benefit.” *Journal of Human Resources* 32(3): 463-80.

Maluccio, J., and R. Flores. 2004. “Impact Evaluation of a Conditional Cash Transfer Program: The Nicaraguan *Red de Protección Social*.” FCND Discussion Paper 184, International Food Policy Research Institute, Washington, D.C.

Morduch J. 1999. “The Microfinance Promise.” *Journal of Economic Literature* 37(4): 1569–1614.

Paxson, C., and N. Schady. 2007. “Does Money Matter? The Effects of Cash Transfers on Child Health and Development in Rural Ecuador.” World Bank Policy Research Working Paper 4226.

Pittm M. M. and S. Khandker. 1998. “The Impact of Group-Based Credit Programs on Poor Households in Bangladesh: Does the Gender of Participants Matter?” *Journal of Political Economy* 106(5): 958–96.

Rivera, J. A., D. Sotres-Alvarez, J. P. Habicht, T. Shamah and S. Villalpando. 2004. “Impact of the Mexican Program for Education, Health, and Nutrition (Progresa) on Rates of Growth and

Anemia in Infants and Young Children: a Randomized Effectiveness Study." *Journal of the American Medical Association* 291(21): 2563-70.

Rubalcava, L., G. Teruel, and D. Thomas. 2005. "Spending, Savings, and Transfers Paid to Women." Unpublished manuscript, University of California at Los Angeles.

Schady, N., and C. Araujo. 2006. "Cash Transfers, Conditions, and School Enrollment in Ecuador." Unpublished manuscript, The World Bank.

Schultz, T. 2004. "School Subsidies for the Poor: Evaluating the Mexican Progresa Poverty Program." *Journal of Development Economics* 74: 199-250.

Thaler, R. H. 1999. "Mental Accounting Matters." *Journal of Behavioral Decision Making* 12: 183-206.

Thomas, D. 1986. "The Food Share as a Welfare Measure." Ph.D. dissertation, Department of Economics, Princeton University.

Thomas, D. 1990. "Intra-household Resource Allocation: An Inferential Approach." *Journal of Human Resources* 25(4): 635-64.

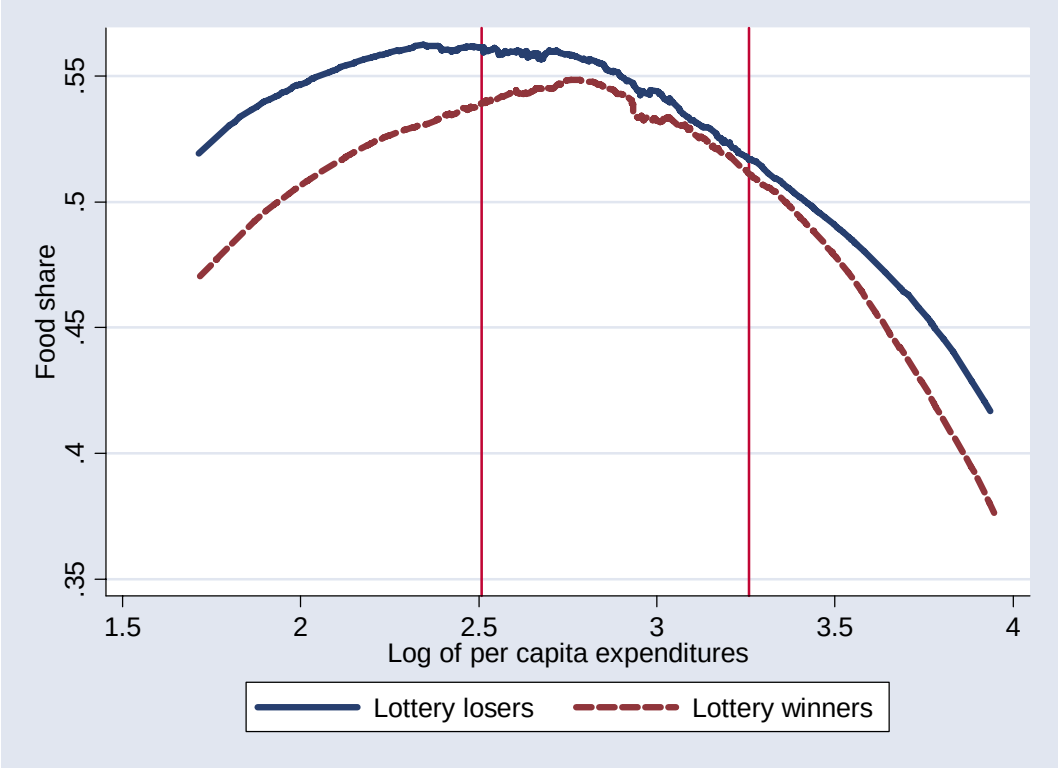
Thomas, D. 1994. "Like Father, Like Son, Like Mother, Like Daughter: Parental Resources and Child Height." *Journal of Human Resources* 29(4): 950-88.

Ward-Batts. J. 2003. "Out of the Wallet and into the Purse: Using Micro Data to Test Income Pooling." Unpublished manuscript, Department of Economics, Claremont McKenna College.

World Bank, and Secretaría Técnica del Frente Social. 2006. "Evaluación de impacto del Bono de Desarrollo Humano." Presentation made at the Central Bank of Ecuador.

Figure 1: Non-parametric food Engel curves

A. Baseline



B. Follow-up

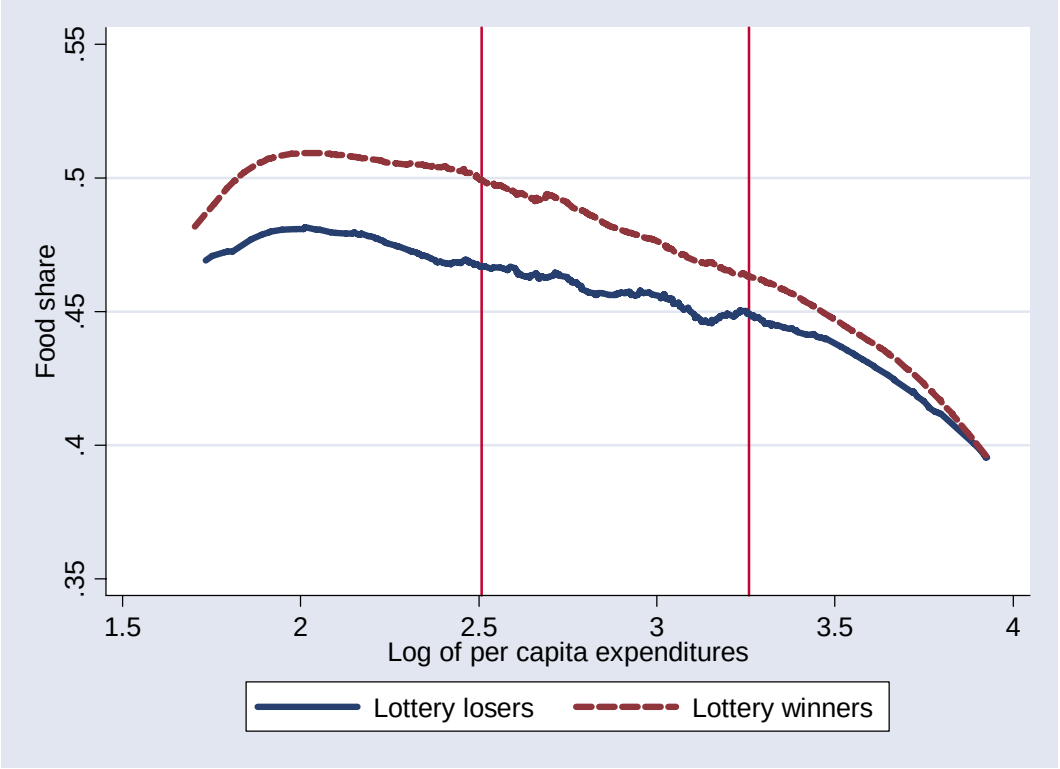


Table 1: Descriptive statistics at baseline

	Mean: households who lost BDH lottery	**Difference**
Log per capita expenditures	2.83	-.022
	(.571)	(.027)
Log per capita food expenditures	2.15	-.061
	(.605)	(.036)
Food share	.538	-.013
	(.168)	(.012)
Household size	5.35	.010
	(1.77)	(.143)
Education of household head	4.16	.020
	(2.81)	(.146)
Household head is male	.856	-.018
	(.352)	(.038)
Age of household head	46.46	-.601
	(9.66)	(.672)
Household head is indigenous	.158	.001
	(.366)	(.027)
Household head is married	.836	-.044
	(.371)	(.030)
	Mean: households who did not receive BDH transfers	**Difference**
Log per capita expenditures	2.84	-.039
	(.569)	(.039)
Log per capita food expenditures	2.19	-.125
	(.612)	(.049)
Food share	.548	-.032
	(.163)	(.013)
Household size	5.20	.293
	(1.85)	(.155)
Education of household head	3.85	.623
	(2.95)	(.155)
Household head is male	.828	.034
	(.378)	(.025)
Age of household head	47.18	-1.99
	(10.20)	(.714)
Household head is indigenous	.180	-.039
	(.385)	(.032)
Household head is married	.785	.053
	(.412)	(.028)

Note: Standard errors corrected for within-parish clustering. Sample size is 773.

Table 2: Comparison of the evaluation sample with national and parish-level averages

	Impact evaluation sample at baseline	1998/99 LSMS	2001 Census
Household size	5.77	5.65	4.19
	(1.84)	(2.12)	(1.51)
Number of rooms in house	2.61	3.00	3.31
	(1.20)	(1.50)	(2.32)
Water from network	0.45	0.78	0.78
	(0.50)	(0.42)	(0.41)
Has toilet	0.24	0.78	0.72
	(0.43)	(0.44)	(0.45)
Has dirt floor	0.28	0.13	0.18
	(0.45)	(0.35)	(0.39)
Age of head of household	44.96	44.11	42.70
	(9.33)	(12.59)	(12.94)
Education of household head	4.47	7.14	7.03
	(2.77)	(4.81)	(5.02)
Household head is male	0.85	0.81	0.77
	(0.36)	(0.39)	(0.42)
Household head is literate	0.83	0.87	0.91
	(0.38)	(0.34)	(0.29)
Household head is indigenous	0.16	0.08	0.17
	(0.36)	(0.28)	(0.38)

Note: The table presents means and standard deviations. Calculations from the 1998/99 LSMS and the 2001 Census are limited to households with children ages 6-17; calculations from the census refer only to parishes included in the impact evaluation sample.
Source: Schady and Araujo (2006)

Table 3: Program effects on food share

	(1)	(2)	(3)	(4)	(5)
			Single difference		
Lottery winner	.023	.025	.025	.022	.016
	(.011)	(.011)	(.011)	(.010)	(.014)
Log pce		.243	.260	.286	-.052
		(.074)	(.070)	(.063)	(.108)
Log pce squared		-.049	-.053	-.057	-.023
		(.012)	(.011)	(.011)	(.018)
Log HH size			-.045	-.047	-.121
			(.020)	(.020)	(.025)
Demographic controls	No	No	Yes	Yes	Yes
Canton FE	No	No	No	Yes	Yes
R-squared	0.005	0.051	0.073	0.107	
			Double-difference		
Lottery winner	.033	.043	.042	.037	.029
	(.016)	(.016)	(.015)	(.016)	(.023)
Log pce		.405	.399	.393	-.099
		(.069)	(.074)	(.072)	(.153)
Log pce squared		-.077	-.076	-.075	-.024
		(.012)	(.012)	(.012)	(.024)
Log HH size			-.070	-.071	-.189
			(.039)	(.039)	(.045)
Demographic controls	No	No	Yes	Yes	Yes
Canton FE	No	No	No	Yes	Yes
R-squared	0.007	0.090	0.099	0.127	

Note: The dependent variable is the food share at follow-up in the single-difference specifications, and the change in the food share in the double-difference specifications. Specification (1) includes no controls; specification (2) includes the log of per capita expenditures and its square; specification (3) supplements this with controls for the log of household size, and variables for the number of family members in 5 age ranges (0 to 5, 6 to 17, 18 to 44, 45 to 64, and 65 or older) interacted with gender; specification (4) also includes a vector of canton-level fixed effects. In the instrumental variables specification in (5) the log of per capita expenditures and its square is instrumented with the log of non-food expenditures and its square. This specification also includes the vector of demographic controls and canton fixed effects. Standard errors in all specifications are corrected for within-parish clustering. Sample size is 773 in all regressions.

Table 4: Respondent's report of what BDH transfers were spent on

	All	Most	A little	None
Food	19.21	30.02	30.19	20.58
Health	3.04	4.83	24.51	67.62
Housing	0.90	1.26	4.33	93.50
Education	4.29	6.44	23.79	65.47
Transportation	---	0.72	38.81	60.47
Clothes	4.51	6.86	22.74	65.88
Goods for husband	--	--	1.65	98.35

Note: Mothers were asked "How much of the bono was spent on [item listed in first column]?" Each row of the table shows the distribution of mothers' responses to these questions. The sample consists of all mothers of children in the analysis sample who reported receiving BDH transfers.
Source: Paxson and Schady (2007)

Table 5: Program effects, by household composition

	(1)	(2)	(3)
	Differences in program effects between female-only and mixed-adult households		
Female-only households (n=52)	.001	.008	-.001
	(.041)	(.047)	(.055)
Mixed-adult households (n=706)	.039	.048	.047
	(.017)	(.019)	(.017)
	Differences in program effects in mixed-adult households with varying levels of relative education of men and women		
Households where women have at least as much schooling as men (n=327)	.028	.033	.030
	(.027)	(.026)	(.024)
Households where women have less schooling than men (n=446)	.045	.052	.051
	(.015)	(.014)	(.014)

Note: The dependent variable is the change in the food share in all specifications. Specification (1) includes no controls; specification (2) includes the change in the log of per capita expenditures and its square; specification (3) supplements this with controls for the change in the log of household size, and variables for the change in the number of family members in 5 age ranges (0 to 5, 6 to 17, 18 to 44, 45 to 64, and 65 or older) interacted with gender. The regressions in the lower panel include 13 dummy variables for the mean years of schooling of adult men and women in the household, in integers. Standard errors in all specifications are corrected for within-parish clustering.

Policy Research Working Paper Series

	Title	Author	Date	Contact for paper
WPS4263	HIV/AIDS and Social Capital in a Cross-Section of Countries	Antonio C. David	June 2007	A. David 82842
WPS4264	Financing of the Private Sector in Mexico, 2000–05: Evolution, Composition, and Determinants	Constantinos Stephanou Emanuel Salinas Muñoz	June 2007	S. Coca 37474
WPS4265	The Structure of Import Tariffs in the Russian Federation: 2001–05	Oleksandr Shepotylo	June 2007	P. Flewitt 32724
WPS4266	The Economic Community of West African States: Fiscal Revenue Implications of the Prospective Economic Partnership Agreement with the European Union	Simplice G. Zouhon-Bi Lynge Nielsen	June 2007	S. Zouhon-Bi 82929
WPS4267	Financial Intermediation in the Pre-Consolicated Banking Sector in Nigeria	Heiko Hesse	June 2007	G. Johnson 34436
WPS4268	Power to the People: Evidence from a Randomized Field Experiment of a Community-Based Monitoring Project in Uganda	Martina Björkman Jakob Svensson	June 2007	I. Hafiz 37851
WPS4269	Shadow Sovereign Ratings for Unrated Developing Countries	Dilip Ratha Prabal De Sanket Mohapatra	June 2007	N. Aliyeva 80524
WPS4270	Jump-Starting Self-Employment? Evidence among Welfare Participants in Argentina	Rita Almeida Emanuela Galasso	June 2007	A. Bonfield 31248
WPS4271	Construction, Corruption, and Developing Countries	Charles Kenny	June 2007	C. Kenny 33540
WPS4272	Migration, Remittances, Poverty, and Human Capital: Conceptual and Empirical Challenges	David McKenzie Marcin J. Sasin	July 2007	M. Sasin 36877
WPS4273	Rules of Origin and the Web of East Asian Free Trade Agreements	Miriam Manchin Annette O. Pelkmans-Balaoing	July 2007	L. Yeargin 81553
WPS4274	Are Labor Regulations Driving Computer Usage in India's Retail Stores?	Mohammad Amin	July 2007	S. Narsiah 88768
WPS4275	Can Foreign Lobbying Enhance Development? The Case of Tourism in the Caribbean	Kishore Gawande William Maloney Gabriel V. Montes Rojas	July 2007	V. Cornago 84039
WPS4276	Human Capital, Trade Liberalization, and Income Risk	Tom Krebs Pravin Krishna William Maloney	July 2007	V. Cornago 84039
WPS4277	Climate Change Adaptation in Africa: A Microeconomic Analysis of Livestock Choice	Sungno Niggol Seo Robert Mendelsohn	July 2007	P. Kokila 33716
WPS4278	Endogenous Irrigation: The Impact of Climate Change on Farmers in Africa	Pradeep Kurukulasuriya Robert Mendelsohn	July 2007	P. Kokila 33716
WPS4279	The Impact of Climate Change on Livestock Management in Africa: A Structural Ricardian Analysis	Sungno Niggol Seo Robert Mendelsohn	July 2007	P. Kokila 33716

Policy Research Working Paper Series

	Title	Author	Date	Contact for paper
WPS4280	Governance Matters VI: Aggregate and Individual Governance: Indicators, 1996-2006	Daniel Kaufmann Aart Kraay Massimo Mastruzzi	July 2007	R. Bonfield 31248
WPS4281	Credit Growth In Emerging Europe: A Cause For Stability Concerns?	Sophie Sirtaine Ilias Skamnelos	July 2007	I. Hafiz 37851