The Effect of Gender-Targeted Conditional Cash Transfers on Household Expenditures: Evidence from a Randomized Experiment*

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Abstract

This paper studies the differential effect of targeting cash transfers to men or women on household expenditures on non-durables. We study a policy intervention in the Republic of North Macedonia that offers cash transfers to poor households, conditional on having their children attending secondary school. The recipient is randomized across municipalities, with payments targeted to either the mother or the father of the child. Targeting transfers to women increases the expenditure share on food by 4 to 5 percentage points. At low levels of food expenditure, there is a shift towards a more nutritious diet.

JEL codes: D12, D13, E21, O12

Keywords: CCT, intra-household, gender, expenditure.

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1 Introduction

When designing cash transfer programs, it is important to understand whether women and men spend their income differently since this directly determines how transfers reach targeted household members. Until now, due to a lack of suitable data, it has been difficult to measure the effect of targeting payments to men or women. Nevertheless, most Conditional Cash Transfer (CCT) programs in developing countries explicitly target payments to women within households (Fiszbein and Schady, 2009). The aim is to improve their well-being, and increase their participation in decision making by enhancing female control over the household's resources. This occurs in spite of there being no consensus on the effects of this practice.

A large body of research supports the idea that control over resources leads to control over decision making (see, e.g., Browning and Chiappori, 1998). Empirically, the income pooling hypothesis (i.e., a restriction on family demand functions, which implies that they are only a function of total income, rather than its distribution across members) has been rejected using both observational and quasi-experimental data. This result is generally based on comparisons of households across whom the contribution to family income of men and women differs. Using data from Brazil, Thomas (1990) shows that a mother's unearned income has a stronger association with her family's health when compared to a father's unearned income. The importance of partners' relative incomes on household decision making is observed in several other settings, including Canada (Browning et al., 1994; Phipps and Burton, 1998), Côte d'Ivoire (Hoddinott and Haddad, 1995), France (Bourguignon et al., 1993), and Thailand (Schultz, 1990). Similar patterns are observed when studying the introduction of policies indirectly affecting the intra-household distribution of income. In South Africa, Duflo (2003) looks at the expansion of a social pension scheme and finds that children's nutritional status is improved when recipients are women, while no effect is observed when the recipients are men. In the United Kingdom, Lundberg et al. (1997) and Ward-Batts (2008) find an effect on expenditure patterns following a change in the Family Allowance policy, which increased mothers' incomes relative to fathers'. Since most income sources are not exogenous to expenditure allocations, focusing on observed variation in relative incomes or on transfer recipiency could bias estimates regarding the importance of control over resources. While these results suggest that targeted transfers could influence expenditure decisions, it is difficult to disentangle the role of relative incomes from other unobservable characteristics.

To overcome this issue, a first wave of experimental studies looks at programs providing cash transfers given to a randomly selected group of mothers. In the case of the Mexican CCT program *Progresa/Oportunidades*, Attanasio and Lechene (2010) document that, although the program substantially increased total consumption, the food share did not decline as expected due to a counterbalancing effect of the program on women's control of household resources. This finding is consistent with other studies focusing on the same program (Angelucci and Attanasio, 2009, 2013; Hoddinott et al., 2000), on *Familias en Acción* in Colombia (Attanasio et al., 2012), on *Bono Solidario* in Ecuador (Schady and Rosero, 2008), and on *Atención a Crisis* in Nicaragua

(Macours et al., 2012). In these settings, it is only possible to compare the spending patterns of recipient households with those of non-recipient households with similar income levels. While these findings are consistent with a model in which mothers and fathers spend income differently, they do not establish this result definitively, nor do they enable us to measure the magnitude of the impact of the identity of the transfer recipient without imposing some structure on the data.

To test whether income is spent differently by men and women, recent field experiments have focused on cash transfer programs in which the gender of the recipient is randomized. This design allows a direct comparison of outcomes between households in which a woman is the recipient of the transfer and households in which the recipient is a man. The existing evidence from such studies shows no impact of targeted transfers on the structure of expenditures. It is problematic to interpret these results as strong evidence that the identity of the transfer recipient is irrelevant. Benhassine et al. (2015) study a cash transfer program in Morocco featuring a degree of randomization in the recipient's gender. They find little or no effect of targeting, but report that husbands were able to fully appropriate the transfer, which means this setting is not suitable to effectively study the question. Haushofer and Shapiro (2016) study the effect of large unconditional cash transfers in rural Kenya, where, among other dimensions, the payment recipients were randomized to be either the wife or the husband. They too do not find any significant difference in the expenditure pattern. However, because this study has multiple experimental arms, the sample size for this comparison is small, and the authors would be able to detect only relatively large effects.[1]

This paper addresses the limitations of these studies by studying whether targeting transfers to women or men affects expenditure patterns. We use data from a nationwide CCT program implemented in North Macedonia from 2010. The program provides cash transfers to poor households, conditional on their children's enrolment in secondary school. The total annual amount of the subsidy, if all conditions are met, corresponds to 8% of household expenditure on non-durables and 16% of food expenditure. Its unique feature is that the gender of the recipient is randomly targeted across the 84 municipalities. In half of the municipalities, the payment is targeted to mothers, and in the other half, it is targeted to fathers.

The design of the CCT program and the richness of the expenditure data allow us to examine whether expenditure patterns differ depending on the transfer recipient's gender. In line with the literature on household demand (see, e.g., Deaton and Muellbauer, 1980b), we focus on budget shares of non-durables, and on food budget shares for different categories within the food basket.[2] Targeting CCT transfers to mothers leads to an increase in the food share by 4 to 5 percentage points, while impacts on other expenditure categories are statistically insignificant. Since the CCT program impacts income levels by providing additional financial resources to enrolled households, we complement these results with an analysis of household demands by estimating Engel curves,

[1] Akresh et al. (2014) study alternative cash transfer delivery mechanisms (among these payment to mothers versus fathers) on household demand for preventative health services in Burkina Faso. However, they do not study the effect on the allocation of household expenditures.

[2] Appendix A.12 discusses results using expenditure levels.

and studying how targeted transfers affect their shape.[3] Targeting payments to mothers leads to an upwards shift of the Engel curve for food, indicating an homogeneous impact across the income distribution. Within the food basket, targeting women leads to a change not only in the intercepts of Engel curves but also in their slopes. In households with low levels of food expenditure (presumably, the poorest), targeting induces a move away from salt and sugar, and towards meat, fish, and dairy. The shift towards a more nutritious diet is in line with the literature highlighting a relationship between female control of resources and improved child investments (Haddad and Hoddinott, 1994; Duflo, 2003; Macours et al., 2012).

Targeted transfers can have large impacts on the intra-household income distribution. The Macedonian CCT provides exogenous variation in the relative income share of either women or men, depending on the payment modality of the program. This setting is uncommon as most of the previous evidence focuses on policy interventions inducing uni-directional changes in relative incomes, generally in favour of women (Lundberg et al., 1997; Ward-Batts, 2008; Attanasio and Lechene, 2014). The program's design, together with detailed information about individual income, allows us to estimate the impact of relative income shares on expenditure choices. An increase in the mother's income share by one percentage point leads to an increase in the food budget share by 0.24 percentage points (Appendix A.8). It is a sizeable effect given that, at follow-up, mothers' income shares were, on average, 17 percentage points higher in municipalities in which payments were targeted to mothers as compared to municipalities in which payments were targeted to fathers.[4] This supports the finding in the literature that the link between transfers paid to women and increases in both expenditure and the food budget share may indeed be due to an increase in the resources controlled by women (Attanasio and Lechene, 2010; Angelucci and Attanasio, 2009, 2013; Attanasio et al., 2012; Schady and Rosero, 2008).

2 The Macedonian CCT program

The Macedonian *Conditional Cash Transfer (CCT) for Secondary School Education* is a social protection program aimed at increasing secondary school enrolment and completion rates among children in the poorest households in the country. It was implemented by the Macedonian Ministry of Labour and Social Policy (MLSP) starting in the 2010/2011 school year across the whole country. It provides transfers to households conditional upon school-age children attending secondary

[3] Mothers' and fathers' Engel curves could have different intercepts and different slopes. For example, food Engel curves for women may have not only a higher intercept, suggesting that they spend a higher fraction of expenditure on food at low levels of income, but also a flatter slope, suggesting that the decline in the food share with income is slower for women than for men. Engel curves for husbands and wives can also cross. When for women the intercept is higher, but the slope is also steeper. In this case, there would be total expenditure values for which a change in household resources would lead to a very little change in the food shares, and others for which the change would be substantial and in either direction.

[4] For *Progresa*, payments represented 20% of household income and were received by women (Attanasio and Lechene, 2010). Assuming the husband's income remains constant, the transfer of *Progresa* corresponds to an increase of 17 percentage points in the wife's income share if the husband is the sole income earner or 8 percentage points if both partners contribute equally.

school at least 85% of the time.[5] The program was offered to beneficiaries of Social Financial Assistance (SFA), a means-tested monetary transfer to people who are fit for work but who cannot support themselves.[6] It targets households in the lowest tail of the income distribution, and is the largest income support program in North Macedonia, accounting for 50% of total spending on social assistance or around 0.5% of the GDP (The World Bank, 2009). Overall, the CCT targets around 12,500 eligible households who were recipients of SFA and simultaneously had at least one child of secondary school age.

The total annual amount of the subsidy provided by the CCT program is, if all conditions are met, 12,000 MKD per student (US$258).[7] The total amount received can be larger if the household has more than one eligible child. Payments are made in four instalments in December, February, May, and July, corresponding to the school terms (September-October, November-December, January-March and April-June). CCT payments are made after a school term is completed and student attendance is checked. Attendance data is then entered in the CCT system by each school's officers, and payments are processed by the MLSP. An internal audit procedure is implemented to guarantee the accuracy of payments. In the first two years of the program, the payment was processed via cheques payable only to the recipient. These payments are thus not anonymous, as the name of the recipient is printed on the cheque. The cheques can be cashed in local post offices or in banks, which excludes the need of a bank account to gain access to the transfer.

The gender of the transfer recipient (i.e., the person named on the cheque) was randomized at the municipality level, allowing payments to be targeted to either the mother or the father of the child. Since the program was implemented in the whole country, a pure control group does not exist. The 84 municipalities composing the Republic of North Macedonia were first stratified into 7 groups depending on population size, and randomized into two groups.[8] In one group of 42 municipalities, the transfer was paid to the mother of the child. We call these *Mother municipalities*. In the other group of 42 municipalities, the payment is transferred to the household head. The household head is the person registered for the SFA benefit at the Social Welfare Centre (SWC), which administers social welfare at the local level, and is generally the father of the child. Across SFA recipients, the household head is the male partner in 87% of two-parent households, which in turn represent 83% of all SFA households.[9] We call municipalities in this group *Father*

[5] In this setting, the conditionality is light. In North Macedonia, enrolment in secondary schooling is mandatory by law, and conditional on enrolment, attendance is well over the 85% set by the program (Armand and Carneiro, 2013; Armand, 2015). Thus, the program is not fundamentally different from an Unconditional Cash Transfer (UCT).

[6] SFA provides a minimum guaranteed income. The benefit is equal to the difference between household income and the social assistance amount determined for the household. It varies from a monthly amount of 1825 Macedonian Denars (MKD, 39 US$) for a one-member household to 4500 MKD (97 US$) for households with 5 or more members. Values in US$ are expressed using the nominal MKD/US$ 2010 exchange rate (OECD, 2018).

[7] The exchange rate used for the US dollar conversion is the 2010 nominal MKD/US$ exchange rate (OECD, 2018). The 2010 purchasing power parity correspondent is 641 US$.

[8] In the final dataset, we observe a total of 83 municipalities (42 Father municipalities and 41 Mother municipalities). While the program was offered with the randomized modalities in all municipalities, at baseline, one municipality among Mother municipalities was found to have no eligible households. This has no effect on baseline balance.

[9] The household head is likely to be the adult male unemployed person representing the household. We do not observe any impact of payment modalities on labour supply or time use for either partner (appendix A.4).

municipalities. In these municipalities there are cases in which the household is headed by a female, who is then the recipient of the transfer in these municipalities (section 4.1). The sample is selected such that the household head is either the mother or the father of the child (section 3.1).

Compliance with local guidelines governing the gender of recipients is easy to ensure. CCT management is computerized, and the payments are processed according to the family composition originally entered in the social protection system. In the administrative data, less than 1% of payments are processed to a man when the payment should have been made to a woman (Armand and Carneiro, 2013). These errors are possibly due to mistakes in the original SFA database that were fixed during the initial implementation of the program. No case is recorded for households in the sample.

3 Data

Data come from two waves of a household survey collected in 2010 and 2012. The surveys include detailed information on a variety of household characteristics and outcomes (demographic characteristics, expenditures on durable and non-durable goods, housing), and individual-level information on household members (education, health, labour supply, and time use).

3.1 Sample structure

The baseline survey was conducted between November and December 2010. This period coincides with the beginning of the school year in which the CCT program became available. Due to delays in the implementation of the program in its first year, the CCT program came into place only after the completion of the baseline data collection, and the first payments were processed only in March–April 2011. At baseline, the population of eligible households was obtained from the MLSP's electronic database of recipients of all types of financial assistance. This was assembled during the summer of 2010 for implementation of the program by digitizing hard-copy archives from the SWCs. A random sample was drawn from households eligible for the CCT program during the summer before the introduction of the program. The follow-up survey was conducted during the fall of 2012, two years after the program began.

In terms of family structure, the sample of eligible households is quite diverse. Households can be composed of a single-parent or two parents, and can be either nuclear or non-nuclear. Table 1 decomposes the full sample in categories based on family type and on whether recipients live in a Mother or Father municipality. In line with the literature on household decision making, a sub-sample of single-family households was selected for the analysis. Multi-family households are dropped from the analysis to avoid further heterogeneity in the household decision process (see, e.g., Browning et al., 2014). The focus is on households with two decision makers being the mother and the father of the child eligible for the CCT program (sub-samples A1, A2, B1, and B2). We do not analyse single parents due to sample size limitations.[10] In addition, we exclude

[10]Selecting only couples in nuclear families excludes 89 households from the follow-up sample, of which 70 house-

Table 1: *Actual recipient of the transfer by type of household and municipality*

Enrolled in CCT	Presence of partners	Identity of the household head	Actual recipient in... FATHER municipalities	Actual recipient in... MOTHER municipalities	Sub-sample	
Yes	Both present	Father	Father	Mother	**A1**	**(N = 606)**
		Mother	Mother	Mother	**A2**	**(N = 79)**
	Father only	Father	Father	Father	A3	(N = 16)
	Mother only	Mother	Mother	Mother	A4	(N = 65)
No	Both present	Father	-	-	**B1**	**(N = 132)**
		Mother	-	-	**B2**	**(N = 35)**
	Father only	Father	-	-	B3	(N = 3)
	Mother only	Mother	-	-	B4	(N = 5)

Note. Father (Mother) municipalities are municipalities in which the transfers are paid to household heads (mothers). The actual recipient differs due to the decision to participate in the program and due to heterogeneity in the household structure. "-" indicates that no one in the household is receiving the transfer since the household does not participate in the program. The sub-samples selected for the analysis are A1, A2, B1, and B2. The column "Sub-sample" presents in parentheses the sample size of each category at follow-up. Non-nuclear households (N = 81) are excluded from the analysis. The overall sample at follow-up is equal to 1,022 households.

non-nuclear households (8% of the sample), in which additional adult household members are part of the family and live in the same dwelling. Selecting only nuclear families also guarantees that in all selected households, the household head is either the father or the mother of the child eligible for the CCT. Results are robust to the inclusion in the analysis of non-nuclear households in which both parents are present.

Among selected households, the combination of household headship and residence determines the actual recipient of the CCT transfer. In Mother municipalities, the mother is always the recipient if a household enrols in the program. In Father municipalities, the recipient depends on who is declared as the household head. This is the father of the child in 87% of cases.

At baseline, we obtain a sample of 766 households with at least one child eligible for the CCT during the first two years of the program. Of these, 74 households were not interviewed at follow-up, resulting in an attrition rate of 9.66%. Attrition is not driven by the treatment modality, and results are robust to attrition correction using inverse probability weighting (Wooldridge, 2010), ANCOVA (see, e.g., McKenzie, 2012), and treatment effects bounds (Lee, 2009). The follow-up sample includes baseline households re-interviewed at follow-up, and a refresher sample of 171 households who were enrolled during the second year of the program, for a total of 852 households. Sample weights are used to account for the fact that at follow-up, households participating in the program were over-sampled (relative to non-compliers, i.e., eligible households who did not receive the transfer). The refresher sample did not introduce any difference between treatment arms, and the results are robust to its exclusion (appendix A.1).[11] Discrepancies between the number of observations in the results tables in section 4 and the total sample size are due to missing

holds had a single female parent and 19 had a single male parent. In this group, a large heterogeneity in family statuses is observed (e.g., divorced, widowed, in relationship but not-cohabiting, etc.), which does not allow drawing conclusions or making comparisons among these sub-groups.

[11] At baseline, in addition to the sample of children eligible for the first year of the CCT program (aged 12-16 the year before, at baseline), an additional sample of households with children in the age group corresponding to the final year of secondary school was collected to study the living standards of the whole population of households in SFA with secondary school children. However, this latter group aged out of the CCT program at the moment of its introduction, and was therefore never eligible. We thus exclude it from the analysis.

values in the outcome variables.

Table 2 presents means and standard deviations for household characteristics at baseline. Column (1) refers to the whole sample, while columns (2)–(3) refer respectively to households living in Father and in Mother municipalities. Households comprise, on average, 4.8 members. The average education of fathers is low, with about 8 years of schooling. However, fathers are more educated than mothers, with an average difference of 1 year of schooling. At the same time, fathers are, on average, 3 years older than their wives. Mothers contribute to 15% of the total household income, with almost 80% of mothers contributing no income to the household (see section 4.1 and appendix A.8 for further details). Fathers also have a larger share of relatives living in the same municipality (71%). When looking at the ethnic composition of the sample, the majority of households are from two main ethnic groups (Macedonian and Albanian), while the remaining 30% is composed of Roma, Turk, and other residual ethnic groups. In terms of location of dwellings, 14% live in the capital city Skopje, 57% in the northern regions of the country, and 27% in municipalities in which the Albanian language is recognized as an official language (in addition to Macedonian).

Column (4) of table 2 presents mean differences between Father and Mother municipalities for all these variables. At baseline, the two groups are balanced on all demographic characteristics reported in the table. A joint test of balance (table 2) and non-parametric tests for the equality of distributions of outcomes across treatment modalities (appendix A.6) confirm that pre-program randomization was effective.

The take-up rate for the program in the first two years is estimated to be 72%. This was computed by merging baseline household survey data with the administrative records of the CCT program. Households are listed in the CCT system if they enrolled a child in school and registered for the CCT program at the local welfare centre. Take-up is slightly higher in Mother municipalities, but the difference is small and statistically insignificant. The compliance rate (i.e., the percentage of classes attended by enrolled students) is also not different across Mother and Father municipalities (Armand, 2015).

3.2 Total expenditure and expenditure shares

Expenditure shares are built using available information about purchases and self-production of a variety of items consumed by households. We consider the main categories of items consumed by households in the sample, including food, tobacco, clothing, schooling, health, utilities, and other goods. Table 3 presents descriptions of each category.

Expenditure data was collected using a recall method (see, e.g., Deaton and Zaidi, 2002). A detailed expenditure section was included in the household questionnaire and divided into subsections depending on the characteristics of the goods and the proposed frequency of purchase. Reference periods are one week for food; one month for expenses related to health, personal hygiene, transportation costs, sport, culture and entertainment, and for meals provided at school; six months for clothing, utensils for the house, toys for children, and house and vehicle maintenance;

Table 2: *Descriptive statistics on household characteristics at baseline, by treatment status*

	Mean and standard deviation			Difference
	All municipalities	Father municipalities	Mother municipalities	[Mother - Father]
	(1)	(2)	(3)	(4)
Household-level outcomes				
Schooling (father)	8.15	8.09	8.21	0.12
	[2.96]	[2.90]	[3.02]	(0.28)
Schooling (mother)	7.08	7.06	7.10	0.03
	[3.40]	[3.21]	[3.57]	(0.36)
Age (father)	44.51	44.61	44.42	-0.19
	[5.21]	[5.08]	[5.34]	(0.44)
Age difference (father - mother)	3.44	3.38	3.50	0.13
	[4.38]	[4.32]	[4.45]	(0.42)
Household members	4.79	4.76	4.82	0.06
	[1.11]	[1.09]	[1.12]	(0.13)
Children 0-12 y.o.	0.73	0.68	0.78	0.10
	[0.86]	[0.76]	[0.95]	(0.07)
Children 13-18 y.o.	1.75	1.74	1.76	0.02
	[0.66]	[0.68]	[0.65]	(0.06)
Head worked in agriculture or breeding	0.27	0.30	0.23	-0.07
	[0.44]	[0.46]	[0.42]	(0.07)
Minority ethnic group	0.30	0.31	0.30	-0.01
	[0.46]	[0.46]	[0.46]	(0.07)
House property holder	0.04	0.03	0.04	0.00
	[0.19]	[0.18]	[0.19]	(0.02)
Mother's income share	14.91	14.00	15.81	1.81
	[33.08]	[32.56]	[33.59]	(2.93)
Father's share of relatives	0.71	0.73	0.69	-0.04
	[0.30]	[0.30]	[0.29]	(0.03)
Municipality-level outcomes				
Part of city of Skopje	0.14	0.13	0.15	0.02
	[0.35]	[0.34]	[0.36]	(0.08)
Albanian is an official language	0.27	0.27	0.26	-0.01
	[0.44]	[0.45]	[0.44]	(0.11)
Unemployment rate	31.53	30.06	32.98	2.91
	[10.12]	[10.50]	[9.53]	(2.27)
Northern region	0.57	0.56	0.57	0.02
	[0.50]	[0.50]	[0.50]	(0.12)
Observations	764	378	386	764
Joint equality test (p-value)	.	.	.	0.91
Program take-up	0.72	0.70	0.75	0.05
	[0.45]	[0.46]	[0.43]	(0.04)

Note. Columns (1)–(3) report sample means (and standard deviations in brackets) for the whole sample and restricted to different treatment modalities. Column (4) reports the difference between (3) and (2) estimated using OLS regressions of the correspondent variable on the treatment indicator and clustering standard errors (reported in parentheses) at the municipality level (*** $p<0.01$, ** $p<0.05$, * $p<0.1$). *Minority ethnic group* includes Roma, Serbs, Turks, and Vlachs. *Father's share of relatives* indicates the share of mother's and father's relatives living in the same municipality that can be attributed to the father's family. The *northern region* comprises the Northeastern, Polog, Skopje, and Eastern administrative regions. To control for joint significance, we run a probit regression of the treatment indicator on the selected variables, and report p-values of an F-test for the joint significance of the coefficients. The treatment indicator is equal to 1 if the household lives in a Mother municipality, and zero otherwise. *Program take-up* refers to the share of households enrolled in the CCT during either of the first two years of the program. This is computed by merging baseline households to the administrative records of the CCT program for the first two years of implementation.

Table 3: *Description of goods and food items*

CATEGORY	**DESCRIPTION**
Food	Cereals, vegetables and fruit, meat, fish and dairy, coffee, tea and other beverages, fats, salt and sugar, and other food items.
Alcohol and Tobacco	Beer, wine, other spirits, cigarettes, and tobacco.
Clothing	Clothing and footwear.
Education	Tuition and fees, uniforms, school supplies, textbooks, additional courses, transportation to school, meals at school, and other school related expenses.
Health	Consultations, hospital services, medicines, surgical appliances, hearing aids, glasses, x-rays, echocardiograms and laboratory tests, transportation to health centres, and other medical expenses.
Utilities and other expenses	Electricity, gas, phone and mobile phone bills, and other non-durable expenditures.
FOOD CATEGORY	**DESCRIPTION**
Starches	Bread, wheat flour, rice, pasta, other cereal products, and potatoes.
Fruit and vegetables	Fresh vegetables and fruit, beans, canned and pickled vegetables, and dried fruit.
Meat, fish, and dairy	Fresh, dried, and smoked meat, fresh and canned fish, eggs, milk, yoghurt, cheese, and butter and other lipids.
Salt and sugar	Salt, sugar, honey, jam, chocolate, sweets and cookies, soft drinks, coffee, and tea.
Other food	All other food items.

Note. The definition of categories is based on the structure of the annual Macedonian Household Budget Survey (SSO, 2010). Food items within categories are defined on the basis of frequency of purchase and familiarity with the item.

and one year for utilities and for school-related costs. The choice of items is based on the Macedonian Household Budget Survey (SSO, 2010), an annual survey conducted by the Macedonian State Statistical Office (SSO) with the purpose of identifying expenditure patterns among Macedonian households.

Using information about expenditure on individual items, we compute an expenditure aggregate for non-durables. We first transform all the expenditures on individual items into a comparable time period, and then sum them. For food items, we consider not only what the household spent on purchases but also what the household actually consumed from self-production. A set of prices built upon a proximity criterion is used to impute the value of self-produced items (see section 3.3 for further details).

At baseline, food is the main component in the budget, accounting, on average, for 56% of household expenditure (appendix table A14). This highlights the focus of the program on the poorest sector of the Macedonian population, as the mean share of food for a representative sample of households was around 34% in 2012 (SSO, 2012). Households allocate, on average, 4% of the total budget to education, 13% to health, 3% to tobacco and alcohol, 5% to clothing, and 19% to utilities and other expenses. Within the food basket, several groups of (aggregated) food categories were identified, reflecting the structure of purchases of a typical Macedonian family. The food items with the highest share is starches, capturing on average 38% of total food expenditure, followed by meat, fish, and dairy, accounting for 36% of total food expenditure.

At baseline, differences in expenditure shares across the two treatment modalities are not statistically different from zero. Because data are based on a recall method, and the identity of the respondent is important, we check whether this dimension varies across payment modalities. Results from appendix A.5 show that this is not a concern. Results are also robust to including indicators for the identity of the respondent as control variables.

3.3 Unit values and prices

Prices for consumed goods are required to compute real expenditure aggregates inclusive of self-produced goods, which are important in rural areas. Since geographically disaggregated prices are unavailable, prices are approximated with unit values using information on expenditure and quantities purchased (Attanasio et al., 2013 follow a similar procedure). This allows approximating prices at household (if the item is purchased), municipality, and regional levels. Unit values can be computed only for food items, since quantities were not collected for non-food items. To proxy for price variation in non-food items, we use regional dummies, a control for whether the household lives in the capital city, and a dummy for rural municipalities in all specifications.

Median unit values are used to compute the value of self-produced goods when a price is not available for the same household. For food items, we compute median unit values starting from the lowest level of geographical clustering (municipality) and substituting for median values at higher levels (region and country) in the case of missing purchases. At each level, when the number of observations is smaller than a minimum (set to 6 observations), we move to a larger geographical cluster. Given the small size of the country and its relative degree of closeness to international markets, it is reasonable to assume that observed unit values are close to farm-gate prices. For these items, it is ideal to use farm-gate prices, since market prices include the intermediaries' mark-up.

Median unit values are also used to adjust total expenditure and food expenditure to real terms by building Stone price indices and subtracting them from their nominal value. Stone price indices are built at the municipality level by weighting median unit values by the sum of all individual household expenditures in a certain municipality and on a certain item, and dividing by total expenditure in the municipality in the food category of the item. Since prices are only available for food, the real adjustment can only be carried out using a food price index. Geographical variation in the price of non-durables is expected to be small due to the limited size of the country.

Prices built using unit values are considered to be exogenous as the CCT program targets only a small part of the population. An issue would arise if households reacted to different payment modalities by differentially substituting expenditure choices towards higher-quality or higher-price goods within the same food category. In this case, household expenditure would rise as a response. At follow-up, we do not observe any effect of payment modalities on aggregate food prices and on household-level price indices (appendix A.3).

4 Results

We use two complementary empirical approaches to study the effect of targeted transfers on the structure of household expenditures. First, we estimate the effect of targeting payments to mothers on expenditure shares (section 4.1). Second, we estimate a demand system and examine how the programme's modality affects the level and the slope of Engel curves for different goods (section 4.2).

4.1 Impacts on expenditure shares

We begin by comparing expenditure shares between households living in municipalities randomized to different payment modalities. Let $mother_j$ be an indicator variable equal to 1 if municipality j is a Mother municipality, and zero otherwise, and denote w_{ij} as an outcome of interest for household i in municipality j (e.g., the share of total expenditure spent on food). To measure the effect of targeting the transfer to mothers we estimate the following relationship using data from the follow-up survey:

$$w_{ij} = \beta_0 + \beta_1 \, mother_j + \mathbf{V}_j'\beta_2 + \mathbf{X}_i'\beta_3 + \epsilon_{ij} \tag{1}$$

where $\mathbf{V}_j$ is a vector of municipality characteristics, and $\mathbf{X}_i$ is a vector of household characteristics. Municipality characteristics include a set of regional dummies, the randomization strata, and indicators for whether the municipality is part of the capital city, and for whether Albanian is an official language in the municipality. Household characteristics include the age and education of both partners, their ethnicity, household size, and a dummy variable to indicate whether the household is involved in farming. The household-specific error term, ϵ_{ij}, is assumed to be clustered at the municipality level.

Columns (1)–(2) in table 4 present, for the two types of municipality, means and standard deviations measured at follow-up for total household expenditure on non-durable goods, for the value of households' durable goods, and for expenditure shares. Columns (3)–(5) present differences between Mother and Father municipalities estimated using equation (1), accounting for different sets of control variables. Column (3) includes only region and stratum indicators, column (4) adds municipality characteristics, and column (5) adds household characteristics. Pre-program differences in expenditure shares across the two treatment modality groups are not statistically different from zero (appendix A.6).

Targeting mothers had a significant effect on the share of total expenditure allocated to food. At follow-up, we find a statistically significant higher food share of 3.91 percentage points for households residing in Mother municipalities. This corresponds to an average increase of 7% in the budget share of food. This result is robust to estimating the difference using ANCOVA, and controlling for the lagged value of the food share (appendix table A2). The impact is also evident by looking at the distributions of the food budget shares. Figure 1 presents the kernel density for the food budget share at baseline and follow-up in Mother and in Father municipalities. At baseline, we cannot reject the null hypothesis that the distribution is equal across municipality types using a two-sample Kolmogorov-Smirnov (K-S) test. At follow-up, the distribution for Mother municipalities is shifted to the right relative to the distribution in Father municipalities. Households driving this difference are those who allocate more than 35% of total expenditure to food, i.e., the poorest households in the sample. A K-S test rejects the null of equality of these distributions in the two samples.

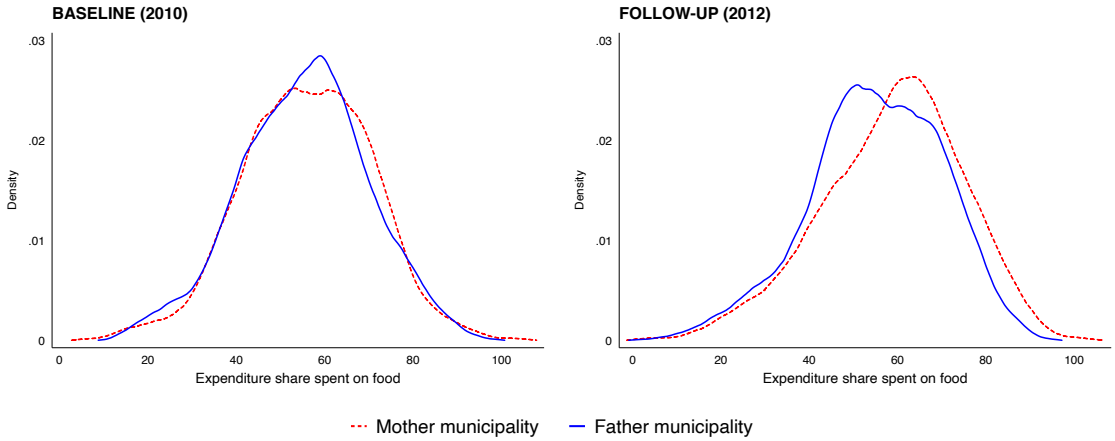
Looking at the effect on expenditure shares for other goods, we observe a marginally signifi-

Table 4: *Expenditure on non-durables, budget shares and food budget shares*

Sub-sample:	Mean and standard deviation		OLS difference [Mother - Father]		
	Father municipalities	Mother municipalities	All municipalities	All municipalities	All municipalities
	(1)	(2)	(3)	(4)	(5)
Expenditure	7.52	7.54	-0.00	-0.00	0.03
	[0.54]	[0.58]	(0.07)	(0.07)	(0.06)
Durables value	10.50	10.55	0.01	0.01	0.05
	[0.88]	[1.22]	(0.11)	(0.11)	(0.10)
Expenditure shares					
Food	55.10	58.73	3.91**	4.01**	3.91**
	[14.95]	[16.51]	(1.76)	(1.68)	(1.55)
Tobacco and alcohol	3.95	2.66	-0.98*	-0.98*	-0.87
	[6.43]	[4.60]	(0.58)	(0.56)	(0.54)
Clothing	5.31	4.24	-0.70	-0.72*	-0.59
	[5.19]	[4.70]	(0.44)	(0.43)	(0.44)
Education	3.86	4.39	0.34	0.32	0.51
	[5.10]	[5.91]	(0.53)	(0.54)	(0.51)
Health	10.67	9.97	-1.14	-1.18	-1.48
	[11.29]	[10.22]	(0.92)	(0.91)	(0.89)
Utilities and other expenses	21.10	20.01	-1.43	-1.46	-1.48
	[10.83]	[11.58]	(1.19)	(1.18)	(1.13)
Food budget shares					
Starches	34.64	35.14	0.71	0.67	0.32
	[16.58]	[16.14]	(1.80)	(1.82)	(1.80)
Meat, fish, and dairy	35.96	35.18	-0.58	-0.63	-0.50
	[15.49]	[15.58]	(1.57)	(1.60)	(1.56)
Fruit and vegetables	13.84	14.90	0.83	0.81	1.01
	[9.87]	[9.12]	(0.74)	(0.74)	(0.77)
Salt and sugar	14.03	13.16	-0.98	-0.89	-0.88
	[8.87]	[7.21]	(0.78)	(0.75)	(0.71)
Other food	0.01	0.07	0.04	0.05	0.06
	[0.21]	[0.77]	(0.03)	(0.03)	(0.04)
Observations	418	429	847	847	847
Municipality controls	-	-	No	Yes	Yes
Demographic controls	-	-	No	No	Yes

Note. Standard deviations are presented in brackets, and standard errors clustered at the municipality level are presented in parentheses (83 clusters in total). *Expenditure* is the total real household expenditure on non-durables (reported in logarithms). *Durables value* is the total value of durables owned by the household (reported in logarithms). *Budget shares* are defined as the ratio between expenditure on a specific category and total household expenditure on non-durables. *Food budget shares* are defined as the ratio between expenditure on a specific category and total food expenditure. *Budget shares* and *food budget shares* are multiplied by 100. Mother (Father) municipalities are municipalities in which the transfer is paid to the mother of the child (household head). In columns (3)–(5), differences are estimated using equation (1). *** denotes significance at 1%, ** at 5%, and * at 10%. All specifications include region and stratum indicators. The full list of controls is presented in section 4.1. The sample is restricted to follow-up observations.

Figure 1: *Non-parametric distribution fit for food budget shares*



Note. The distribution fits are estimated non-parametrically using kernel density estimation assuming an Epanechnikov kernel function. Bandwidths are estimated by Silverman's rule of thumb (Silverman, 1986). The left (right) panel shows the comparison between Mother and Father municipalities at baseline (follow-up). A two-sample Kolmogorov-Smirnov test statistic is equal to 0.06 (p-value 0.51) at baseline, and 0.15 (p-value < 0.01) at follow-up.

cant decrease for clothing and for tobacco and alcohol, although these results become statistically insignificant when we add controls to the model. In terms of the allocation of food expenditures within the food basket, we cannot detect any statistically significant effect (lower panel of table 4).

Observed differences in budget shares are not driven by impacts on overall household expenditure, frequency of purchases, or quality of items purchased. When looking at total expenditure on non-durables, we do observe neither significant mean differences between the two groups nor distributional differences (appendix A.6). This is an expected result as the program did not introduce a pure control group, i.e., the CCT transfer is offered to every eligible household in the country. Second, if the program increases the share allocated to food in the same way across all enrolled households, a differential take-up could also explain differences in food budget shares. While program take-up is slightly higher in Mother municipalities, the difference is not large enough to affect the results (appendix A.15). Third, we find no significant effects of targeting mothers on the proportion of non-zero expenditures for each item or on the frequency of visits to the market by both partners (appendix A.2). In addition, there is no evidence of households shifting to more expensive food items or substituting food away from home production and into manufactured goods (appendix A.3).

Since enrolment in the program is voluntary, estimates produced using equation (1) are intent-to-treat (ITT) estimates of the impact of gender targeting. Among the potential recipients initially sampled, 72% received at least one CCT payment in the first two years of the program, and the remaining decided not to enrol in the program. In addition, whether the mother actually receives the transfer sometimes also depends on the choice of who in the household is declared as head. It is possible that in a Father municipality the transfer is given to the mother if she is declared as head of household (see table 1). Household headship decisions occurred before the introduction

of the CCT as part of the SFA registration, which is a pre-condition for the CCT program.

To account for the endogenous take-up of the program and reconcile the results with the literature discussed in section 1, we exploit the exogenous shifts in the intra-household distribution of income resulting from the CCT payment modality, and we analyse the impact of the parental relative income on budget shares. We compute mothers' income shares using data on several sources of income among the selected households, collected from both self-reported information and administrative data on transfers. Following Almås et al. (2018), we include labour income, income from financial assistance (including CCT transfers), and assistance from family and friends. Assistance from family and friends includes all financial transfers not in the form of debt received by family members (who are not part of the household) or by friends. The effect of the mother's income share on the expenditure share spent on different goods can be estimated by instrumenting the income share with the randomization indicator variable.

At follow-up, residing in a Mother municipality increases the mothers' income share by 17 percentage points (appendix A.8). 2SLS estimates of the effect of the mother's income share on expenditure allocations show that an increase of a one standard deviation in the mother's income share leads to an increase in the food share of around 0.24 percentage points (appendix table A17). Similar results are obtained when replacing the mother's income shares with more direct measures of income transfer. For instance, an increase by 1,000 MKD in the total transfer to the mother leads to an increase in the food budget share by 0.31 percentage points. No significant effect is observed on expenditure shares for the other goods or on budget shares within the food basket.[12] OLS estimates of the relationship between the food budget share and the mother's income share at follow-up show no significant correlation (appendix table A16).

4.2 The demand for food

A main objective of CCT programs is to increase household income, one of the main determinants of expenditure choices. In the case of the Macedonian CCT, the annual transfer is equal to 8% of the average household expenditure on non-durable goods, an increase that would plausibly affect how households allocate expenditures. While, on average, total expenditure is not influenced by the payment modality, the relative importance of the transfer is distinct at different points of the expenditure distribution. In the lowest quartile (the poorest), the transfer is equal to 13% of total expenditure, while in the top quartile it represents only 4%. Therefore, the effect of targeting payments to mothers may be heterogeneous across the distribution of total expenditure.

It is thus important to examine how Engel curves are affected by targeting transfers to mothers rather than to fathers. A shift in the intercept of the Engel curve indicates homogeneous impacts across different expenditure levels, while a change in the slope suggests that impacts are hetero-

[12]This paper addresses the impact of targeting transfers to women on household decisions. A related question is whether women who generate more income in the household, say through their employment, have stronger bargaining power. While the two questions are related, they are different, because the sources of income are quite distinct. It is possible than an increase in women's labour income of the same magnitude as the CCT transfer can have different effects than the ones reported in the paper.

geneous. In line with Attanasio and Lechene (2014), we estimate a demand system for different goods using the following approximation to an Almost Ideal Demand System (Deaton and Muellbauer, 1980a):

$$\begin{aligned} w_{ij}^{n} &= \beta_0 + \beta_1\, mother_{ij} + \delta\, ln\left(\frac{exp_{ij}}{a\,(p)}\right) + \eta\, ln\left(\frac{exp_{ij}}{a\,(p)}\right) * mother_{ij} + \\ &+ \sum_{n=1}^{N} \gamma_{ijn} ln\,(p_{nj}) + \mathbf{V}_j'\beta_2 + \mathbf{X}_i'\beta_3 + \epsilon_{ij} \end{aligned} \tag{2}$$

where w_{ij}^{n} is the expenditure share of good n, exp_{ij} is total household expenditure on non-durables, $a(p)$ is a price index (section 3.3), and p_{nj} is the price of item n in municipality j. β_1 captures the intercept change in the Engel curve induced by the payment modality of the CCT, and η captures the change in the slope of the Engel curve. $\mathbf{V}_j$ and $\mathbf{X}_i$ are vectors of municipality and household characteristics. We use as control variables the same household and municipality characteristics of equation (1), which are also generally used in the literature for the estimation of Engel curves.[13] The household-specific error term, ϵ_{ij}, is assumed to be clustered at the municipality level. Following Browning and Chiappori (1998) and Attanasio et al. (2013), we also experiment with the Quadratic Almost Ideal Demand System (Banks et al., 1997). For the goods categories considered, the coefficient on the quadratic term of total expenditure is never significant, suggesting that a linear relationship is sufficient to fit the data.

In estimating the demand system, we consider the endogeneity of total expenditure. This is due to non-random measurement error related to the infrequency of purchases, recall errors, or taste heterogeneity. Since the demand system in equation (2) introduces the endogenous variable in the model in a non-linear way, we estimate the demand system using a control function (CF) approach.[14] Identification requires an instrument for total expenditure that is excluded from the equations of the demand system. Following a standard procedure in the literature, we use measures of wealth, specifically the value of durable goods and the land owned by the household, as instruments for total expenditure (see, e.g., Dunbar et al., 2013). We use contemporaneous measures of wealth. In a single-time-period analysis (as in a post-intervention estimation), we can assume that households determine consumption expenditures in each period by maximizing the expected value of an additively separable utility function, subject to a budget constraint determined by wealth. True consumption will thus be a function of wealth, which is uncorrelated with consumption allocation errors if allocation decisions within a period are separable from sav-

[13] Since the CCT program provides payments conditional on children attending school, it may be important to control for the number of children enrolled in school. However, this variable can be endogenous to expenditure allocations, even controlling for family structure. The estimates are unaffected by its inclusion as a control variable or by estimating the demand system by instrumenting for it (appendix B.3). We treat it as exogenous to expenditure choices.

[14] In the linear case, estimates from CF and 2SLS are identical. With non-linear functions in endogenous variables, the CF approach is preferred to 2SLS. First, it provides a test of endogeneity of total expenditure by jointly testing the significance of the CF in the estimating equations. Secondly, the CF approach can be more flexibly adapted to non-linear models than 2SLS (Wooldridge, 2010). Appendix B.2 compares 2SLS and CF estimates when no interaction between endogenous variables is considered, and assuming the functional form of the CF used in the main text.

ings decisions across periods. Appendix A.17 shows that results are robust to the selection of instruments using the Post-Double Selection LASSO procedure (Tibshirani, 1996; Belloni et al., 2012).

Following the CF approach, we estimate a first-stage regression of total expenditure on all exogenous variables in the model (appendix B.1). The partial F statistic on all instruments is high, suggesting that selected instruments are good predictors for total expenditure. After computing the residuals from the first-stage regression, we incorporate functions of the residuals as control variables in each equation of system (2). The exact form of the CF depends on the specific assumptions about the probability distribution of the residuals in the model's equations. We rely on a series approximation to the function, using second-order polynomials in the residuals. The equations in the model are jointly estimated, and standard errors are computed using the bootstrap, allowing for clustering at the municipality level. Appendix B provides additional details on the procedure.

Table 5 reports estimates of the Engel curve for food. Columns (1)–(2) present estimates using equation (2). In column (1), the impact of living in a Mother municipality is estimated solely on the intercept of the Engel curve, restricting the interaction term with household expenditure to be equal to zero. In column (2), we allow for a non-zero interaction. Payment modality can thus affect both the intercept and the slope of the Engel curve. In the estimation of the Engel curves, we demean the main independent variables to facilitate the interpretation of the main effect when an interaction term is introduced.

In line with Engel's law, food is a necessity: the share of expenditures allocated to food decreases as total expenditure increases. An increase by 10% in total expenditure is associated with a decrease of 0.8-0.9 percentage points in the food budget share. This corresponds to an expenditure elasticity of food demand (at the mean values in the sample) of 0.84.[15] While food represents a much larger share of household expenditure at lower levels of total household expenditure, offering transfers to women only shifts the intercept on the Engel curve by 4.47 percentage points. The change in the slope is not statistically significant. At baseline, we do not observe any differences in the intercept or slope of Engel curves for food between households in Mother and Father municipalities (appendix A.6). This suggests that targeting payments to mothers results in a higher food budget share throughout the expenditure distribution.

Similar to the analysis in section 4.1, we account for endogenous take-up of the program when estimating the Engel curve for food, by substituting $mother_j$ in equation (2) with the (demeaned) mother's income share. Since this variable is endogenous (as discussed in section 4.1), we use as the exclusion restriction the randomization variable $mother_j$. We expand the CF approach by adding another first-stage regression for the mother's income share to the already described first-stage expenditure equation. The main equation for the Engel curve is then modified to include

[15] Following Green and Alston (1990), the expenditure elasticity of food demand at mean values in the AIDS specification is equal to $(1 + \delta/w^F)$, where δ is estimated using equation (2) and w^F is the average food budget share at follow-up. See estimates in table 5.

Table 5: *Engel curve for food*

	Dep. var.: Food budget share			
	(1)	(2)	(3)	(4)
Mother Municipality	4.47***	4.47***		
	(1.70)	(1.71)		
Mother Municipality x Expenditure		-0.19		
		(3.16)		
Mother's income share			0.30***	0.29***
			(0.09)	(0.10)
Mother's income share x Expenditure				0.06
				(0.06)
Expenditure	-8.49**	-8.38**	-8.66**	-8.78**
	(3.49)	(3.85)	(3.41)	(3.43)
Observations	847	847	847	847
R^2	0.195	0.195	0.205	0.207
Joint significance of main effect and interaction (p-value)	.	0.03	.	0.00
Endogeneity test (p-value)	0.00	0.00	0.00	0.00

Note. Estimates based on the CF approach (equation 2). Bootstrap standard errors (2,000 replications) presented in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. The dependent variable is the *food budget share*, defined as the ratio between the expenditure on food and the total household expenditure. *Expenditure* is the total (real) household expenditure on non-durables (reported in logarithms). *Mother municipality* is a dummy variable equal to 1 if the household resides in a Mother municipality, and zero otherwise. *Mother's income share* is the share (multiplied by 100) of total parental income that can be attributed to the woman in the household, and is instrumented with the *Mother municipality* dummy. *Expenditure* and the *mother's income share* are demeaned. The test of joint significance of the main effect and the interaction is performed with an F-test. The endogeneity test is performed as a joint Wald test for the equality to zero of all coefficients in the polynomial of the first-stage residuals. The full list of controls is presented in section 4.2.

second-order polynomials in first-stage residuals for both expenditure and the mother's income share. Columns (3)–(4) of table 5 present the estimates. An increase in the mother's income share by 1 percentage point shifts the intercept of the Engel curve up by 0.30 percentage points. Again, we do not observe any significant change in the slope.

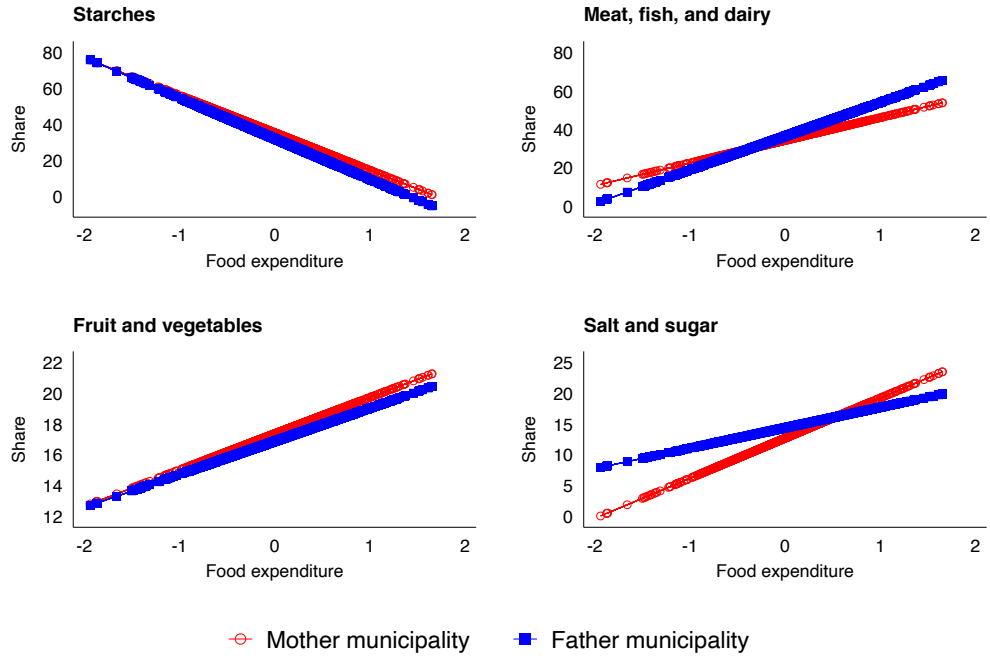
This result helps explaining the finding in the literature that CCT transfers paid to women lead to both a higher total expenditure, and a higher food budget share. Small increases in the mother's income share can offset the reduction in the food budget share induced by an increase in expenditure. Estimates show that compensating for the reduction in the food budget share induced by a 10% increase in total expenditure would require a shift of the income share towards mothers of about 3 percentage points. This is consistent with the findings of Angelucci and Attanasio (2013) and Attanasio and Lechene (2010) for Progresa, a CCT program that offers a transfer (relative to household expenditure) about 2.5 times larger than the transfer in the Macedonian CCT program. Attanasio and Lechene (2010) estimate that an increase of 20% in total expenditure (the average transfer of the program) reduces the food budget share by 4 percentage points. If the husband is the sole income earner and his income is constant, the transfer targeted at wives would increase their income share by about 17 percentage points. We would thus need an increase in the food budget share of 0.24 percentage points per percentage point increase in income share to obtain an overall zero effect of the transfer. We estimate that the effect on the food budget share of targeting mothers would increase to 7 percentage points if the Macedonian CCT transfer were comparable to that of Progresa (appendix A.7).

We extend the demand analysis to items within the food basket. The demand system is estimated using the share of food expenditure allocated to food category m as a dependent variable,

and replacing total expenditure with the (demeaned) food expenditure. We implement a CF approach similar to the one described above to deal with the endogeneity of food expenditure. Table 6 presents the estimated coefficients of the demand system for different items in the food basket. Similar to table 5, columns (1)–(2) show the impacts of residing in a Mother municipality on the demand system, while columns (3)–(4) show the impact of the mother's income share. Figure 2 plots the Engel curves using the estimated coefficients in column (2).

At lower levels of expenditure, households tend to consume mainly starches, while at higher levels, these are substituted with meat, fish, and dairy, vegetables, and salt and sugar. As a consequence of targeting transfers to mothers, we observe statistically significant changes in the intercepts and/or the slopes of the Engel curves for all food categories except fruit and vegetables. Targeting CCT payments to mothers in households with low levels of food expenditure induces a move away from salt and sugars, and towards meat, fish, and dairy. At baseline, Engel curves are not statistically different across treatment groups (appendix A.6). This suggests that, at low levels of food expenditure, targeting payments to mothers leads to a shift towards a more nutritious diet.

Figure 2: *Engel curves for food categories*



Note. The figure presents the estimated Engel curves at follow-up for the different food categories (holding other control variables constant at the average) for households living in Mother and in Father municipalities. Coefficients are reported in column (2) of table 6. *Food expenditure* is the total (real) expenditure on food (reported in logarithms and demeaned). Food categories are defined in table 3.

4.3 Discussion

In line with previous evidence (Thomas, 1990; Browning et al., 1994; Phipps and Burton, 1998; Bourguignon et al., 1993; Schultz, 1990), the results discussed in sections 4.1 and 4.2 highlight

Table 6: *Demand system for the food basket*

	Dep. var.: Food budget share of food category			
	(1)	(2)	(3)	(4)
Starches				
Mother municipality	3.34*	3.34*		
	(2.03)	(2.03)		
Mother municipality x Food expenditure		1.76		
		(2.72)		
Mother's income share			0.21*	0.20*
			(0.12)	(0.12)
Mother's income share x Food expenditure				0.09*
				(0.05)
Food expenditure	-21.47***	-22.57***	-22.26***	-22.17***
	(4.31)	(4.88)	(4.40)	(4.17)
Meat, fish, and dairy				
Mother municipality	-2.18	-2.17		
	(1.83)	(1.77)		
Mother municipality x Food expenditure		-5.73**		
		(2.76)		
Mother's income share			-0.14	-0.13
			(0.11)	(0.11)
Mother's income share x Food expenditure				-0.11**
				(0.05)
Food expenditure	13.95***	17.55***	14.19***	14.08***
	(4.36)	(5.10)	(4.33)	(4.08)
Fruit and vegetables				
Mother municipality	0.50	0.50		
	(0.95)	(0.96)		
Mother municipality x Food expenditure		0.20		
		(1.67)		
Mother's income share			0.03	0.03
			(0.06)	(0.06)
Mother's income share x Food expenditure				-0.02
				(0.03)
Food expenditure	2.28	2.16	2.41	2.39
	(2.52)	(2.88)	(2.63)	(2.65)
Salt and sugar				
Mother municipality	-1.69**	-1.69**		
	(0.86)	(0.85)		
Mother municipality x Food expenditure		3.21**		
		(1.25)		
Mother's income share			-0.10**	-0.10**
			(0.05)	(0.05)
Mother's income share x Food expenditure				0.04*
				(0.02)
Food expenditure	5.34***	3.32	5.77***	5.81***
	(1.99)	(2.39)	(1.88)	(1.91)
Observations	849	849	849	849

Note. Estimates based on the CF approach (equation 2). Bootstrap standard errors (2,000 replications) presented in parentheses are clustered at the municipality level (83 clusters in total). *** denotes significance at 1%, ** at 5%, and * at 10%. The dependent variables are the shares of food expenditure spent on each category. Food categories are defined in table 3. *Food expenditure* is the total (real) expenditure on food (reported in logarithms). *Mother municipality* is a dummy variable equal to 1 if the household resides in a Mother municipality, and zero otherwise. *Mother's income share* is the share (multiplied by 100) of total parental income that can be attributed to the woman in the household. *Food expenditure* and the *mother's income share* are demeaned. The full list of controls is presented in section 4.2.

the importance of the recipient of the transfer for the allocation of expenditures. Both our results and the literature document that higher income shares associated with women in the household are related to higher expenditures on food (Haddad and Hoddinott, 1994; Attanasio and Lechene, 2010). This paper provides additional evidence against the income pooling hypothesis and the unitary model of household decision making (Becker, 1991). To explain our data, one needs to consider models of intra-household decision making. In general, some of these models assume cooperative behaviour between household members, resulting in efficient outcomes, while others allow for non-cooperative behaviour (see, e.g., Browning et al., 2014).

Assuming a cooperative model, if preferences differ among partners, the observed effects of targeting transfers to mothers could be explained by an increase in the mother's weight in the decision process. A greater control of household resources by mothers translates into a stronger alignment of expenditure allocations with their preferences. As partners' relative income has been used in the literature as a distribution factor (i.e., a variable affecting the decision process but not preferences nor budget constraints), it is reasonable to assume that non-labour income derived from the CCT transfer and targeted at mothers could indeed raise the mother's power in the decision process. This is true even though this is transferred income rather than labour income, and the mechanism linking women's control of resources to their decision-making power could vary depending on the source of income considered.

An increase in the mother's weight in the decision-making process could also be related to an effect on female empowerment. This can be associated with either having the title of holder of the payment, or the experience of being targeted by the program. This hypothesis is in line with Almås et al. (2018), who show that women targeted by payments in this same program experience greater empowerment, defined by their willingness to pay for receiving a cash transfer instead of having her husband receive it.[16]

A non-cooperative model, in which mothers and fathers share the same preferences, but are assumed to have different individual budget constraints, would also be consistent with the observed results. Since the CCT transfer shifts the recipient's budget constraint, independently from any effect on decision power, targeted transfers could result in differential allocation of expenditures. This would be the case if targeting mothers increases the provision of female-provided goods due to specialization in household production (Doepke and Tertilt, 2019). While income-hiding among partners has been shown to be relevant in a non-cooperative setting (Ashraf, 2009), the high level of awareness of the CCT program at follow-up (89% of respondents), not different across treatment arms, suggest it may not be central in this study (appendix A.16). The setting of this paper does not allow us to discriminate between a non-cooperative and a cooperative setting.

Consistent with both model types, we find relevant impact heterogeneities that are related to social and cultural factors. The increase in the food budget share when mothers are targeted is

[16]The increase in empowerment could also reflect a higher level of control of household resources. It is not possible to use the measurement collected in Almås et al. (2018) because it focuses on urban areas only, and fewer households in the sample were part of the study.

mainly driven by households presenting characteristics that the literature associates with lower decision-making power for mothers, such as the mother being younger or less educated than the father (Browning et al., 1994), having weaker family networks (Attanasio and Lechene, 2014), and having never worked for a wage (see, e.g., Alesina et al., 2013). In contrast, in households presenting characteristics associated with higher female decision-making power, we cannot reject the null hypothesis of a zero effect (appendix A.10). To give a specific example, Muslim households and households of non-Macedonian ethnicity are characterized, on average, by less gender-equal values and a more traditional family model when compared to non-Muslim and Macedonian households (appendix A.11). For non-Muslim and Macedonian households, we observe no significant effect on the food expenditure share, while for Muslim households and households of non-Macedonian ethnicity, the effect is positive and statistically significant.

Since CCT transfers can be perceived as compensation for reduced labour income (or contribution to home production) of the child enrolling in school, an alternative mechanism that could explain changes in household consumption relates to individual time allocation among family members.[17] Increased subsidies to women could influence the role of mothers and daughters in the provision of within-household labour services (see, e.g., Morduch, 1999) or the time spent to ensure compliance with the CCT. To examine these hypotheses, we focus on the share of the day spent by both partners sleeping, doing household chores, working, taking care of the elderly, shopping, leisure with and without children, helping children to study, and doing other activities. We find no effect of targeting the CCT payment to women on the amount of time allocated to any of these activities (appendix A.4). We also study parental monitoring of school attendance, by looking at whether parents check school reports, attend parental meetings, and ask children about school. Similarly, we observe no significant effect of targeting the transfer to mothers (appendix A.14). In line with experimental evidence from *Progresa/Oportunidades* (Skoufias and Di Maro, 2008; Skoufias et al., 2001), we also observe no effect on self-reported labour supply among adults (appendix A.4).

The CCT payment modality can induce differential effects related to within-household labour substitutability among children targeted by the program. We therefore check for heterogeneity in the effect of targeting mothers by the gender composition of children in secondary school age (appendix A.13). While we cannot reject the null hypothesis of equality of the effect at 90% of confidence, the food budget share is significantly larger in Mother municipalities if we restrict the sample to households with male children only. However, this is not statistically different for households with female children only or with both male and female children. To understand this result, we estimate the effect of targeting mothers on a series of child-level outcomes related to schooling and labour supply. We observe no significant effect of targeting on secondary school enrolment and school attendance, while we observe a positive effect on CCT enrolment and the CCT transfer among boys only. When looking at labour supply, this effect does not translate in

[17] The framework discussed in section 4.2 does not explicitly look at labour supply decisions. It assumes two-stage budgeting and separability of consumption decisions from labour supply.

a lower propensity to do house chores and work for salary. For most outcomes, we cannot reject equality of the effect between boys and girls. Evidence suggests the CCT payment modality had no effect on time allocation and labour supply decisions among family members.

5 Conclusion

Most social programs in the developing world support poor families with transfers that are mainly channelled towards women. However, the effect of providing additional cash to a specific family member on household consumption allocation is still unclear. One problem in the literature has been the lack of suitable data for such an analysis. Most transfer programs target transfers solely to women, making it impossible to examine outcomes of households in which the recipient of the transfer is a man.

This paper studies the effect of a nationwide transfer program that, in its first years, randomized the gender of the transfer recipient: the Macedonian CCT for Secondary School education. This program provides cash transfers to poor households in Macedonia conditional on their children being enrolled in secondary school. Target recipients were randomized across municipalities to be either the mother or the father of the child, so the program deliberately changed the control of resources in households living in different municipalities. When provided with an additional source of income, mothers and fathers spend income differently. Targeting women increases the share of resources allocated to food and has a significant impact on the shape of Engel curves for different food items. For lower levels of food expenditure, mothers allocate extra resources to a more nutritious diet.

Evidence on the effect of targeting payments to mothers versus fathers is central for the design of future social programs aimed at supporting human capital formation among children. We show that choosing the recipient of the transfer has direct consequences on the way household expenditures are allocated, both in terms of the resources allocated to food consumption and the composition of the food basket, both of which are fundamental for the development of children.

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